Circular business models in context & experimentation

Copenhagen 29 November 2018

Nancy Bocken

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

Topics for today

- Circular Economy: why and what (brief)
- Circular business models
- Product design and value chain perspective
- Customer perspective
- Implementation
- Business experimentation
- Ecologies of Business Models experimentation

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Circular Economy: Why and what?

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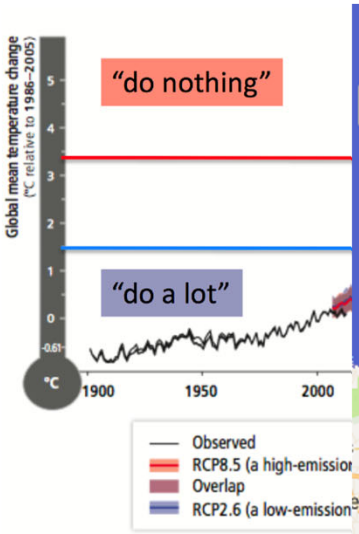
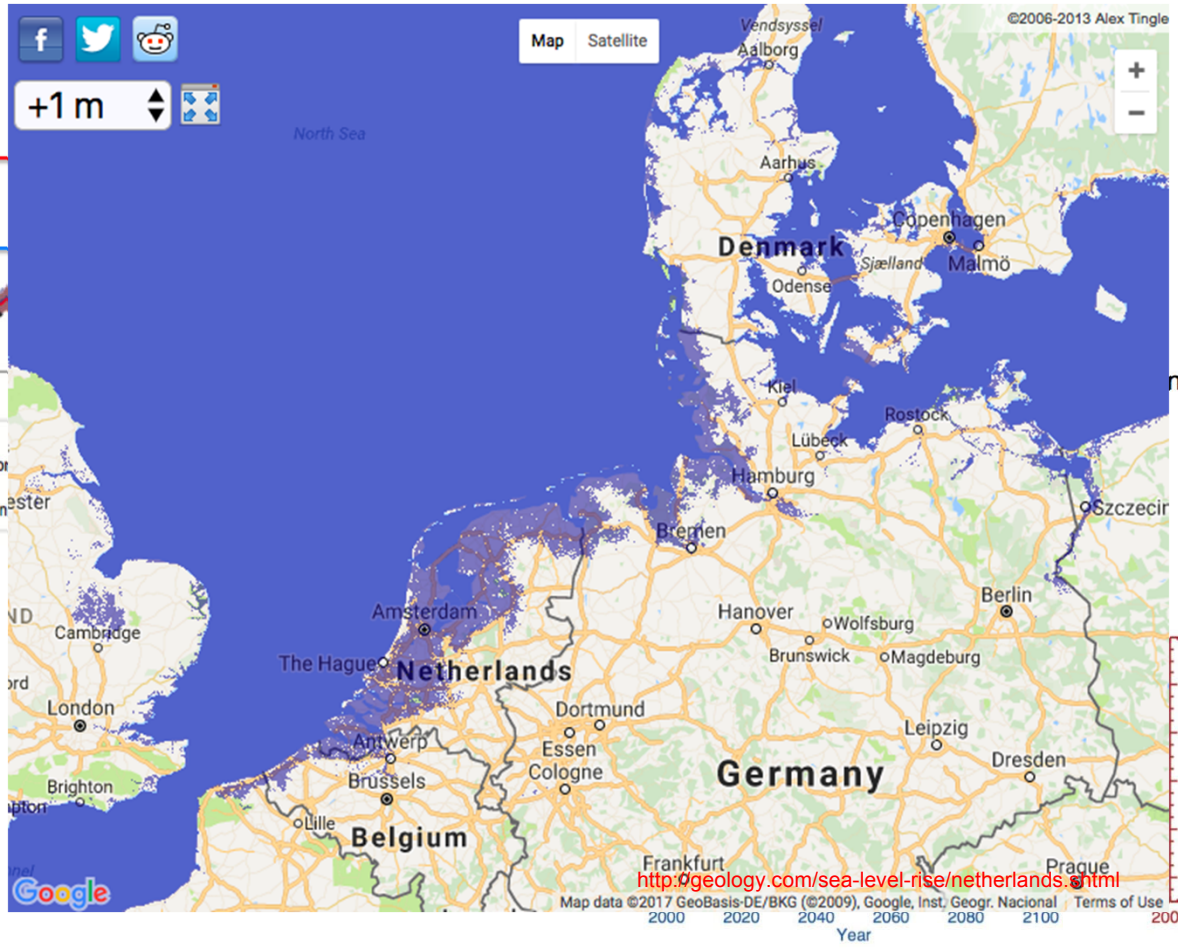
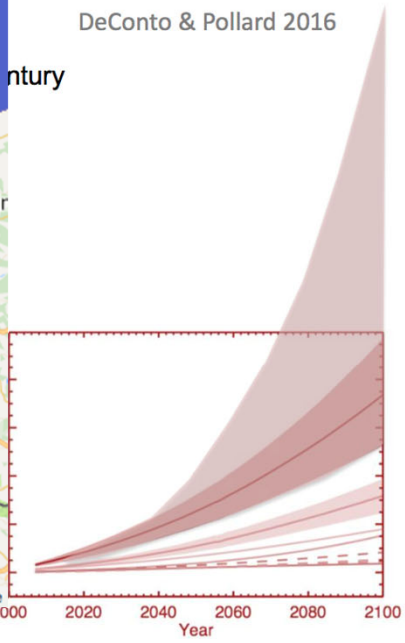
Societal challenges

Risks of future climate change





http://geology.com/sea-level-rise/netherlands.shtml



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

Up to 70 cm

Up to 2 m

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

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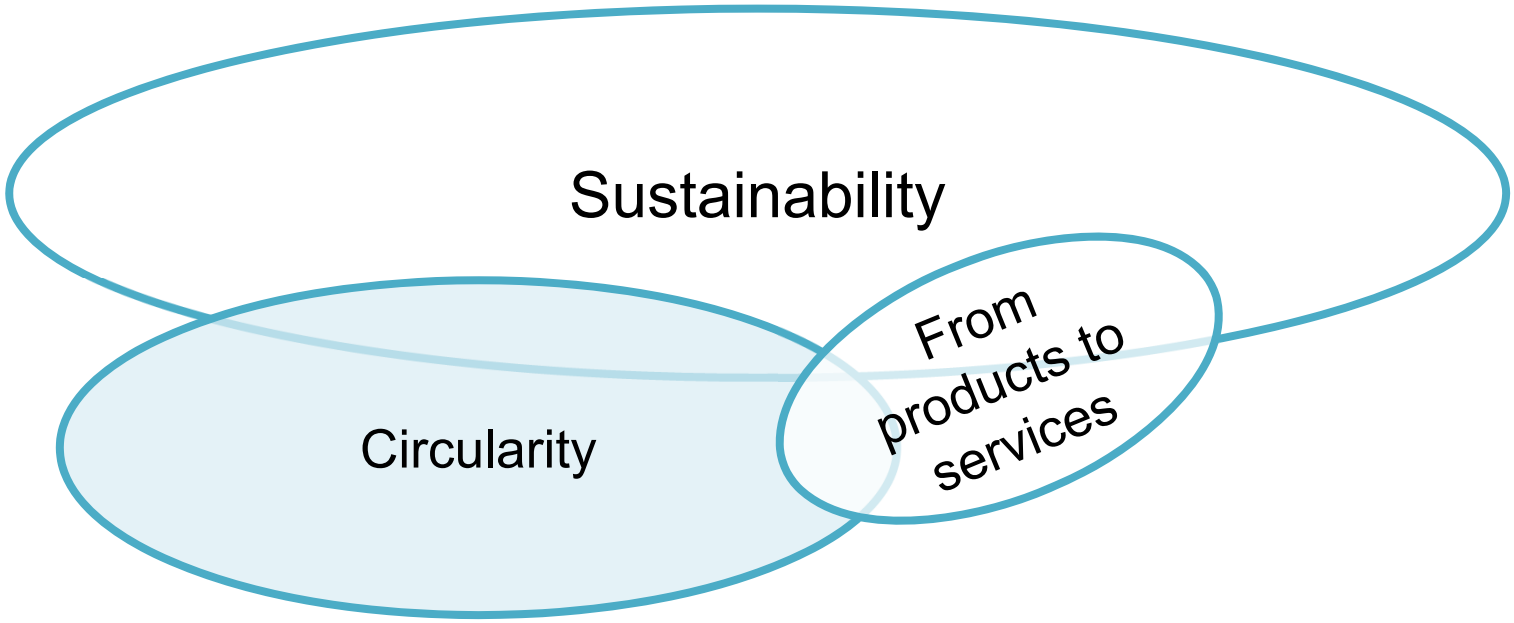
Circular Economy & Sustainability



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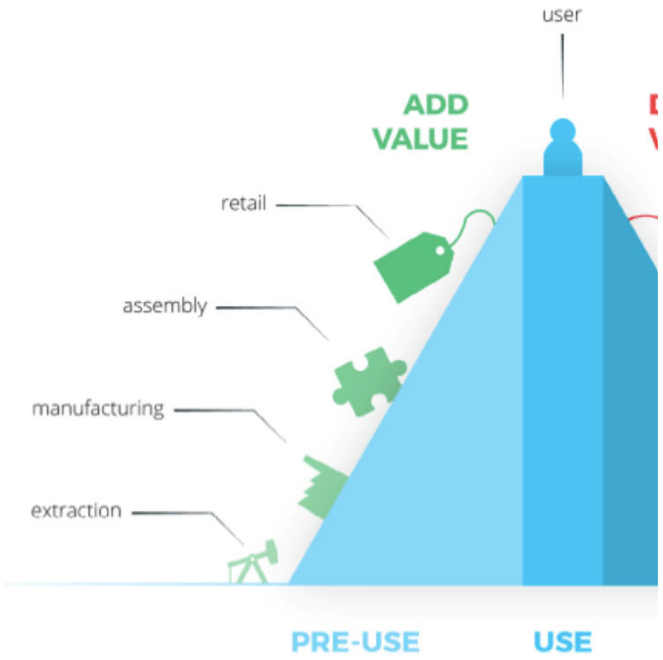
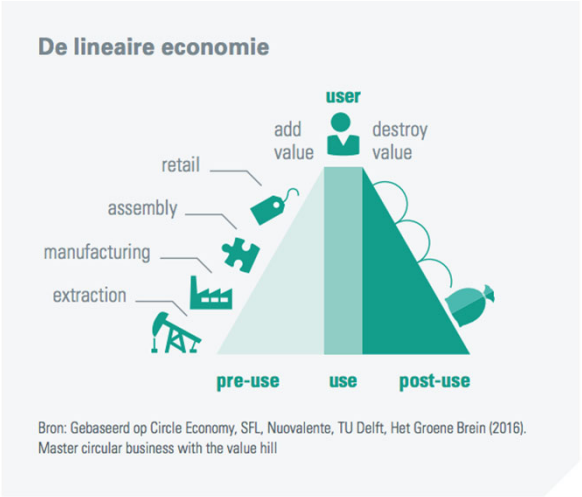
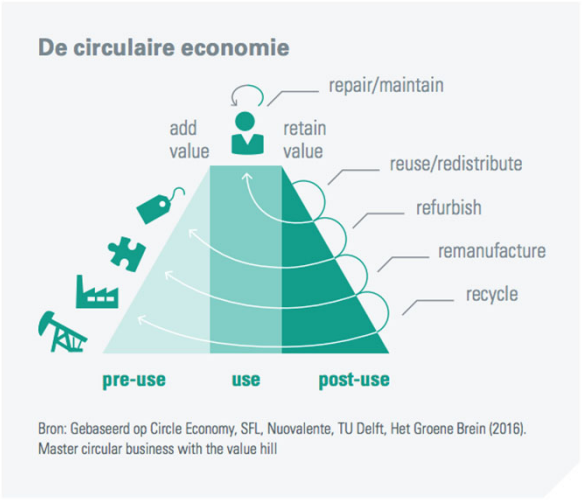
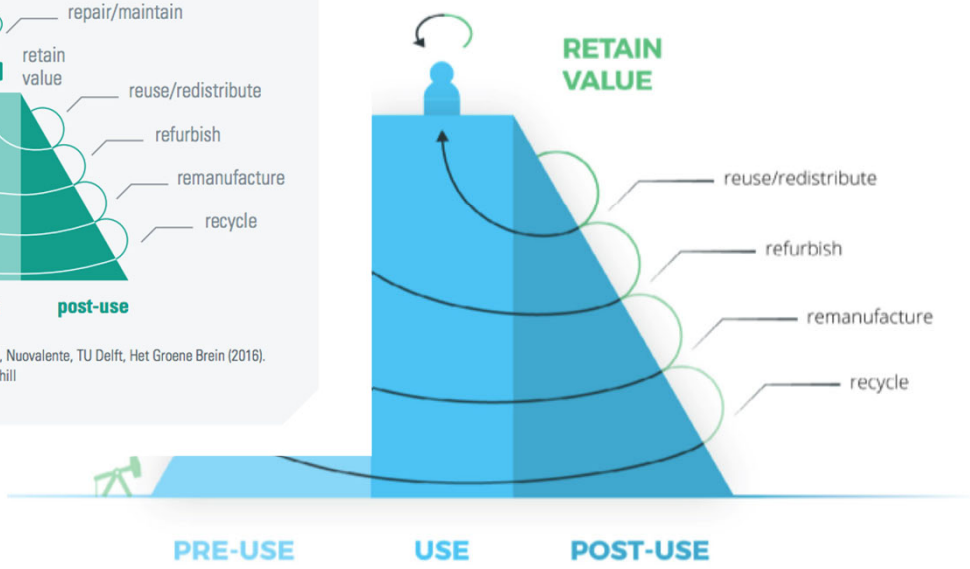
The Value Hill







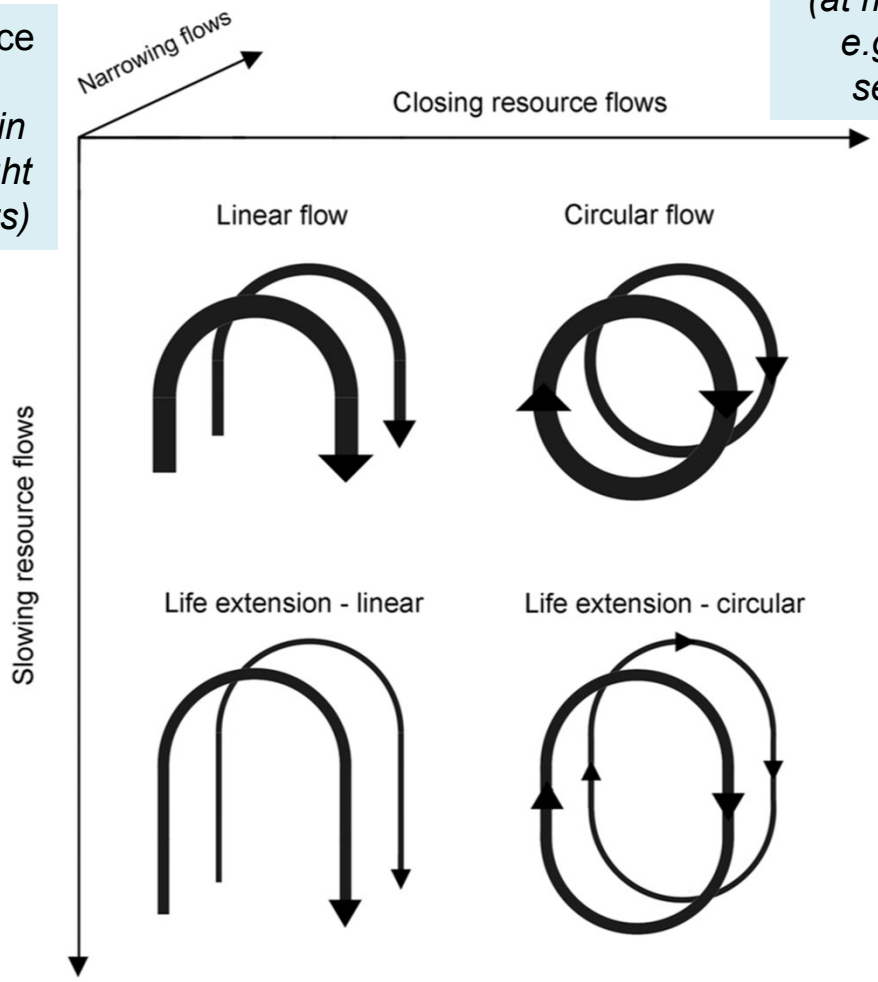


Value Hill source. Achterberg, E., Hinfelaar, J., Bocken, N.M.P. 2016. Master circular business models with the Value Hill. White paper, September 2016

Slowing (resource) consumption: Key strategy in a Circular Economy

Minimising resource use per product *(e.g. Efficiencies in manufacturing, light weighting products)*

Recycling *(at material level e.g. primary, secondary)*



Extending the useful life of products *(including avoiding overconsumption)*

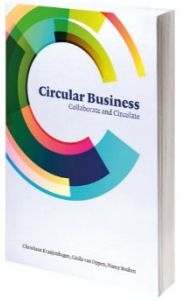


Figure: Circular Economy framework. Source: Bocken, N.M.P., de Pauw, I., van der Grinten, B., Bakker, C. 2016. Product design and business model strategies for a circular economy. J. Industrial & Production Engineering, 32 (1), 67-81.
+ Kraaijenhagen et al. 2016. Circular Business. Available at: www.circularcollaboration.com

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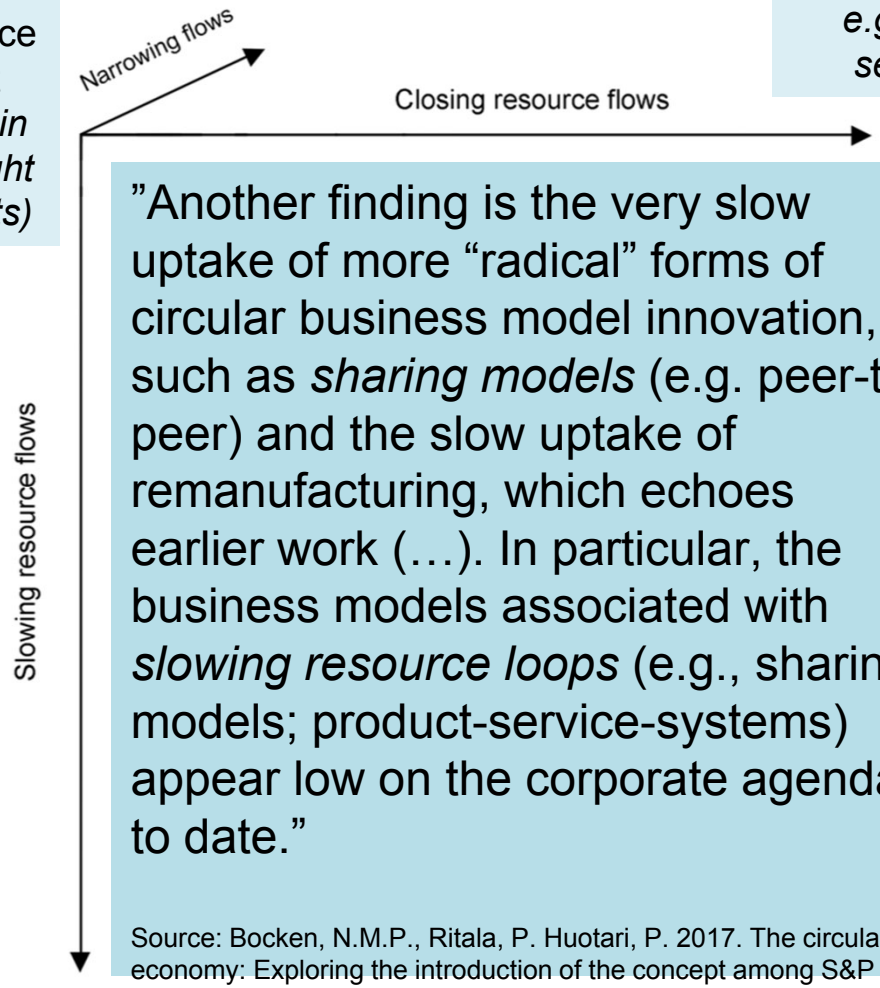
Slowing (resource) consumption: Key strategy in a Circular Economy

Recycling
(at material level e.g. primary, secondary)

Minimising resource use per product
(e.g. Efficiencies in manufacturing, light weighting products)



Extending the useful life of products
(including avoiding overconsumption)

”Another finding is the very slow uptake of more “radical” forms of circular business model innovation, such as *sharing models* (e.g. peer-to-peer) and the slow uptake of remanufacturing, which echoes earlier work (…). In particular, the business models associated with *slowing resource loops* (e.g., sharing models; product-service-systems) appear low on the corporate agenda to date.”

Source: Bocken, N.M.P., Ritala, P. Huotari, P. 2017. The circular economy: Exploring the introduction of the concept among S&P 500 firms. Journal of Industrial Ecology. 21 (3), 487–490.

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Resource flows & loops

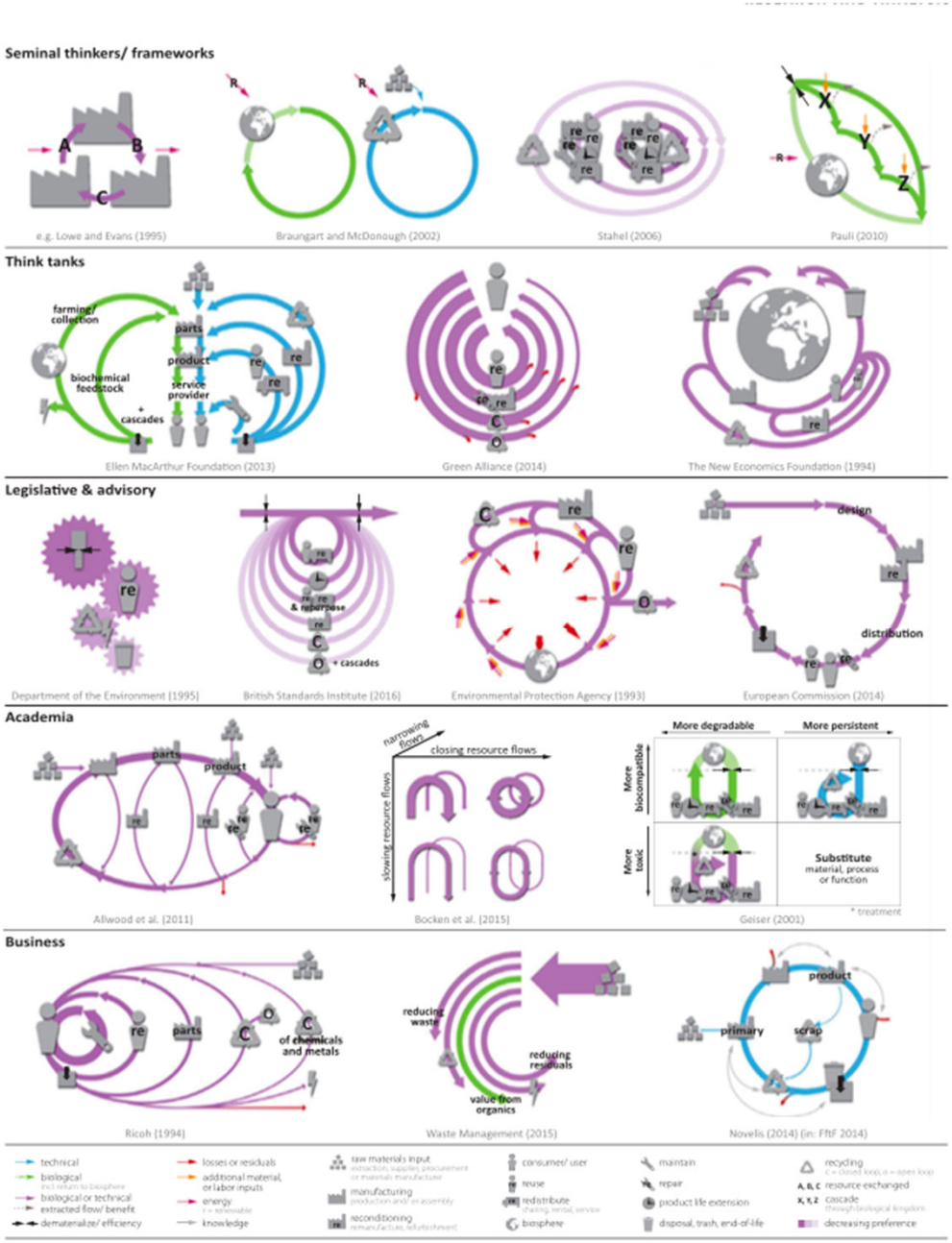

Figure: selection of interpretations of waste and resource management frameworks. Source: Blomsma, F., Brennan, G. 2017. The Emergence of Circular Economy J. Industrial Ecology , 21 (3).

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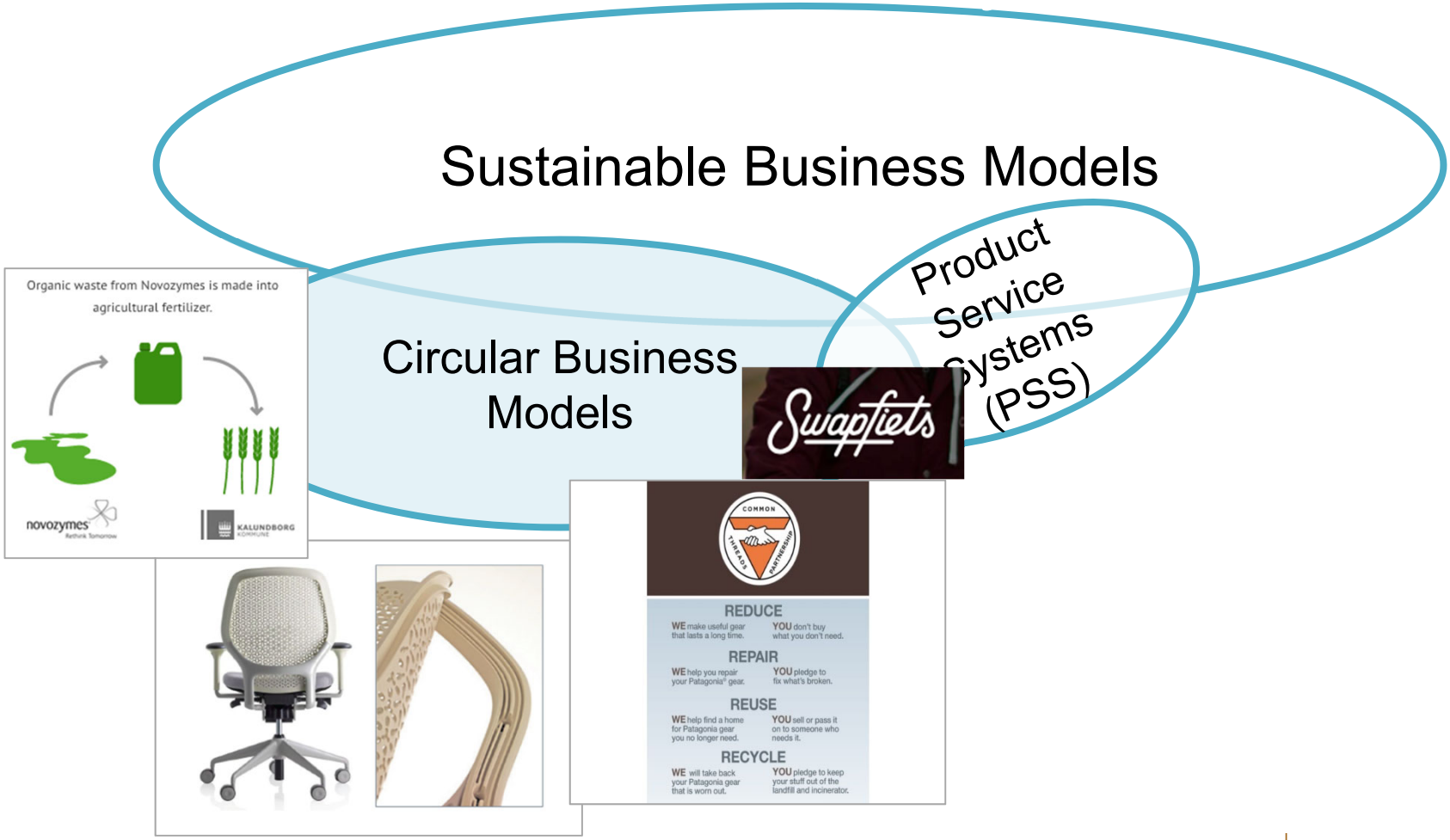
Circular Business Models

Circular Business Models



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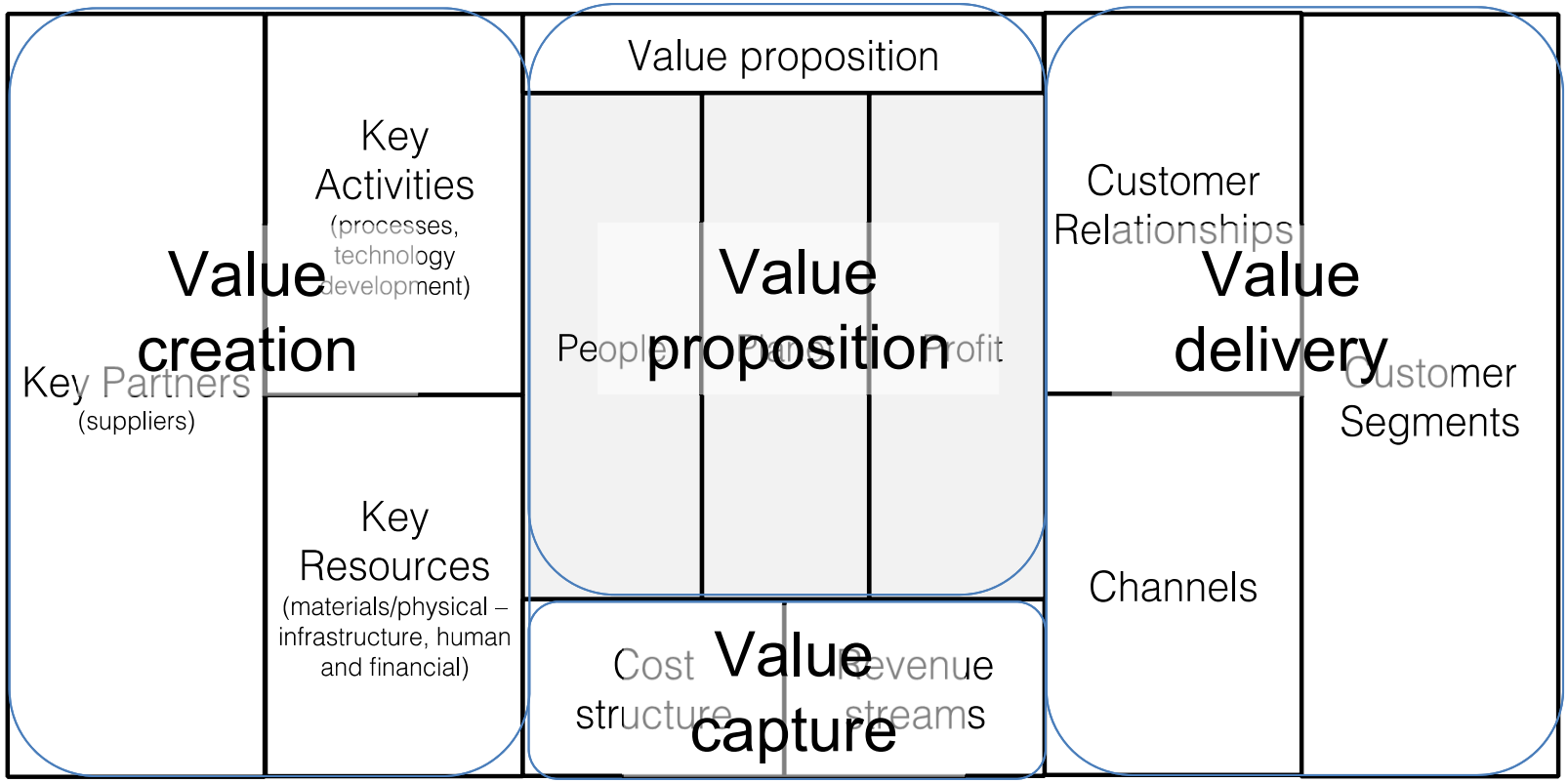
Sustainable business models



Adapted from:
www.businessmodelgeneration.com

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Sustainable business models

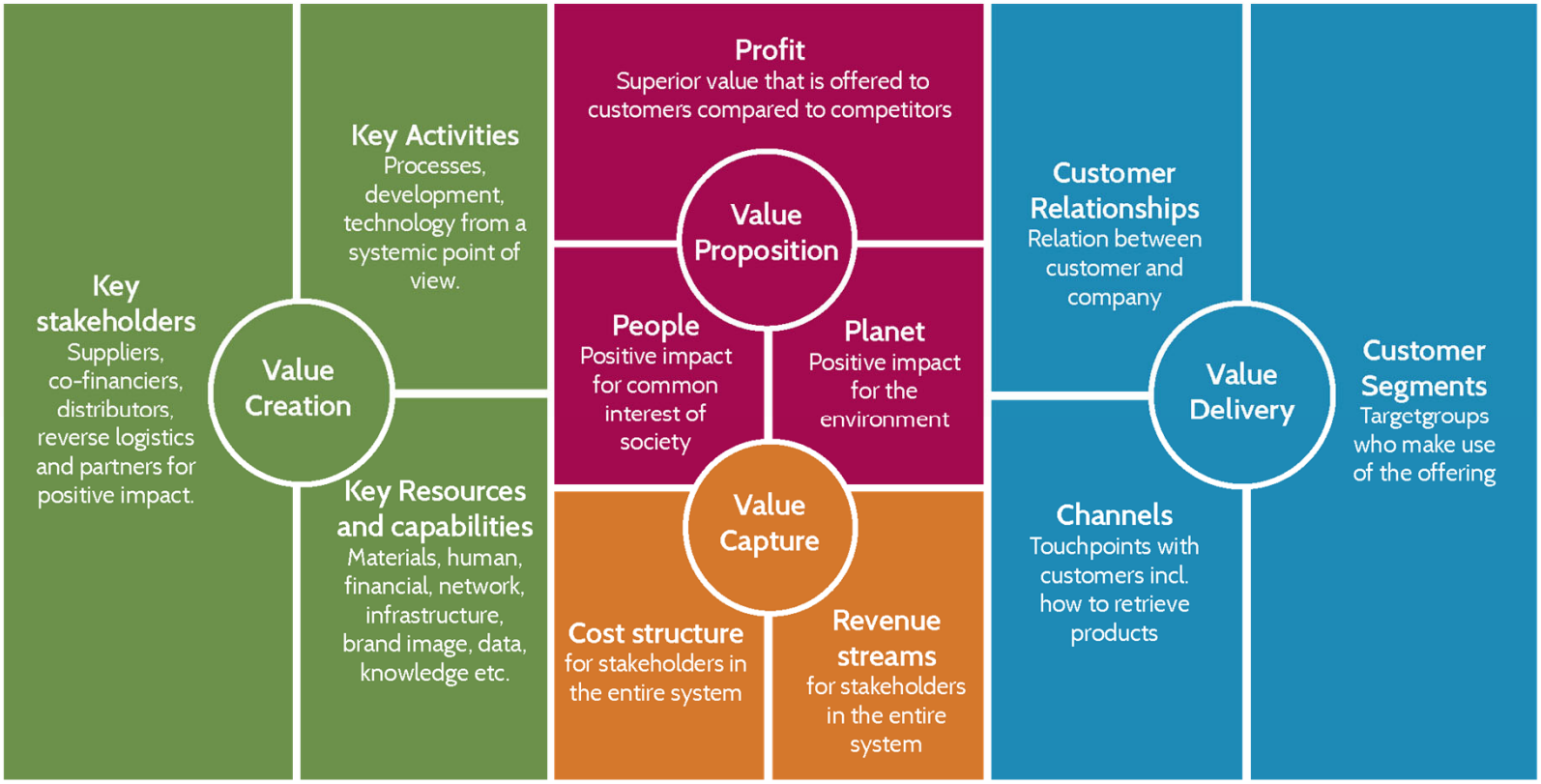

Figure: Sustainable Business Model Canvas. Source: Bocken, N.M.P. 2015. Conceptual framework for shared value creation based on value mapping, Global Cleaner Production Conference, Sitges, Barcelona, 1-4 November 2015 based on Osterwalder & Pigneur - businessmodelgeneration.com.

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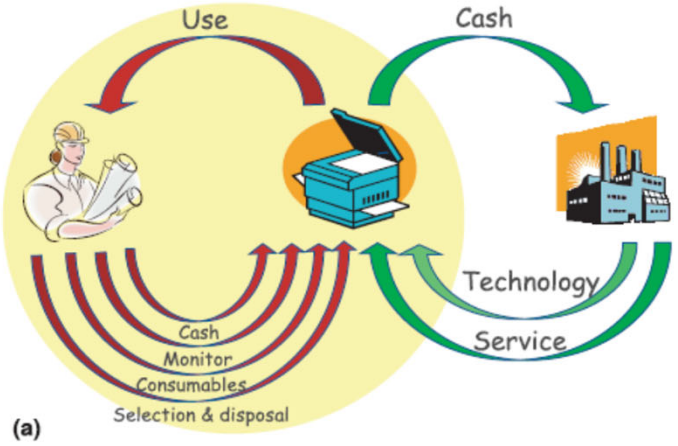
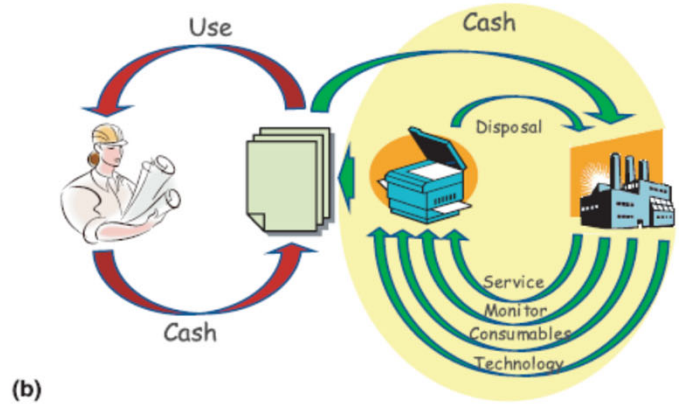
From products to services



(a) Traditional purchase of photocopier;



(b) purchase of a document management capability

(Baines, et al,2007)

Baines, T., Lightfoot, H., Evans, S., Neely, A., et al., 2007. State-of-the-art in product- service systems. Proc. Inst. Mech. Eng. J. Eng. Manuf. 221 (10), 1543e1552.

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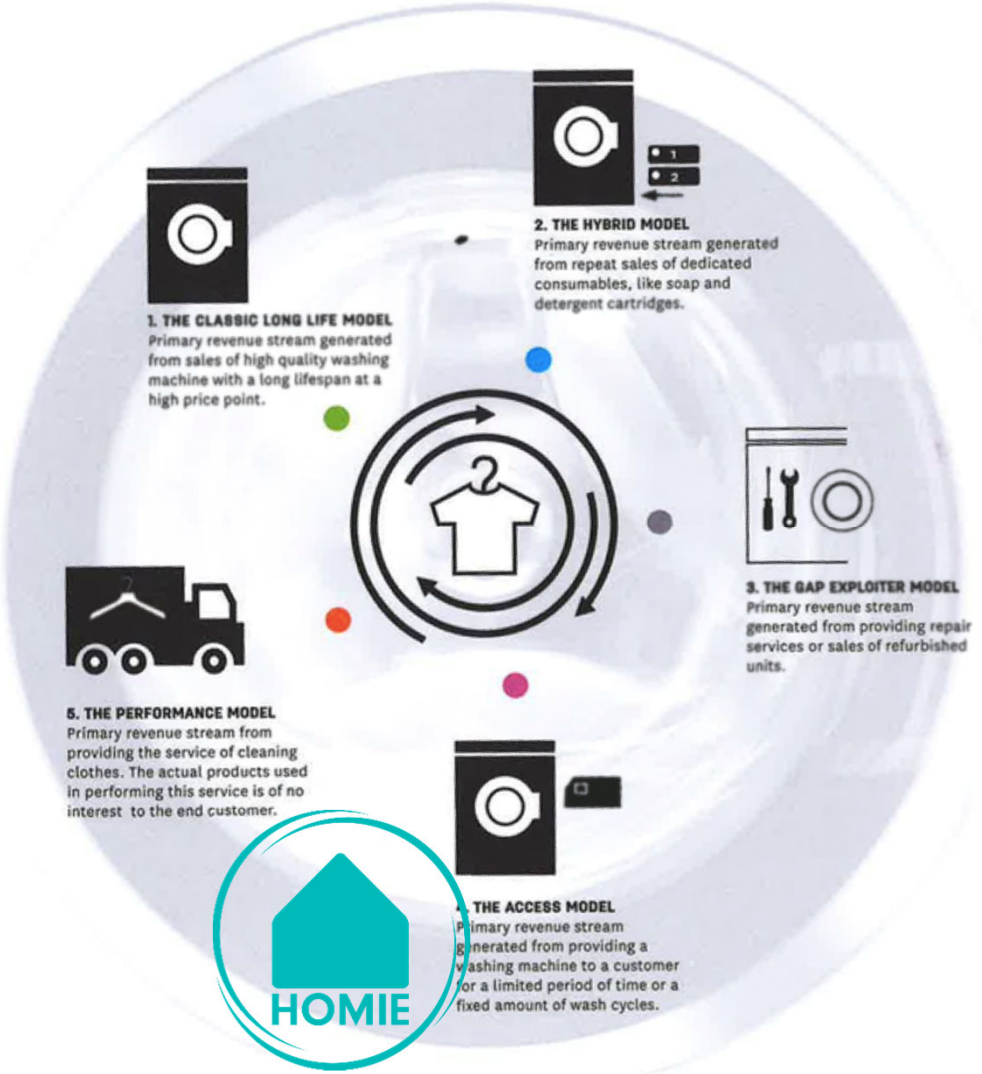
Products that Last framework



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.
HOMIE: www.homiepayperuse.com

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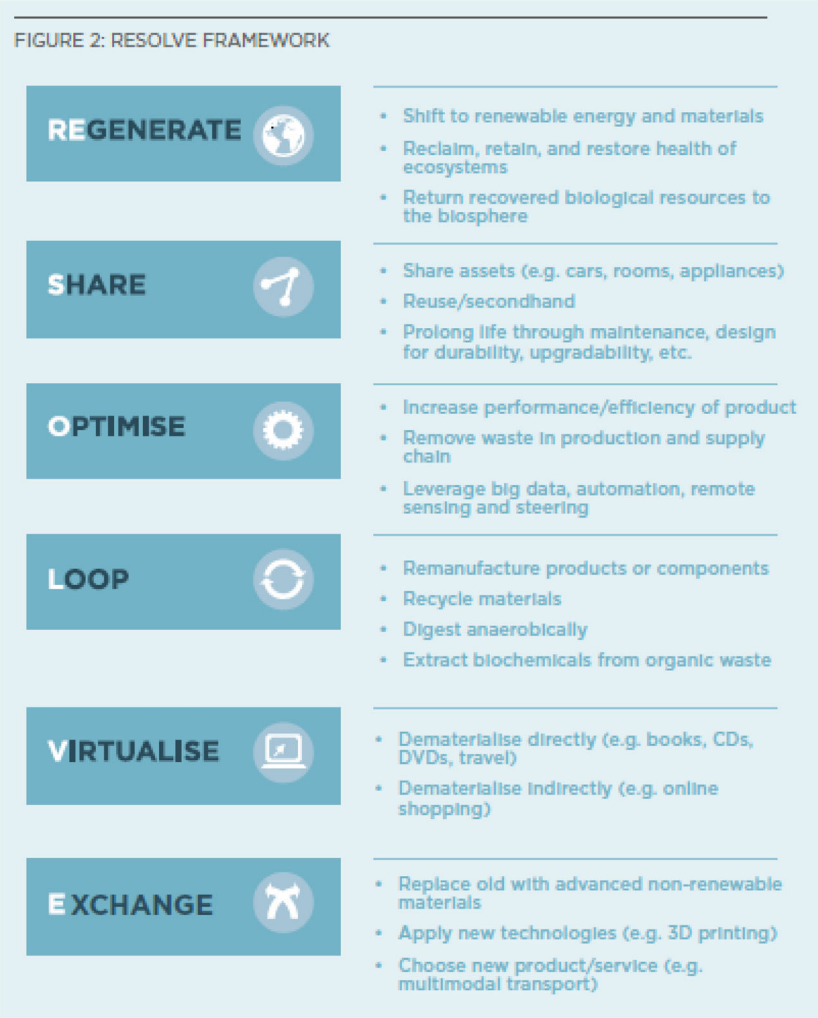
ReSOLVE Framework



Examples (Lewandowski, 2016)

Energy recovery
Chemicals leasing

--

Maintenance and repair
PSS

--

Produce on demand
PSS

--

Remanufacture
Upcycle

--

Dematerialised services

--

New technology

Sources: Ellen MacArthur Foundation. Toolkit for policymakers: https://www.ellenmacarthurfoundation.org/assets/downloads/government/20150924_Key_Exhibits_Policy_toolkit.pdf
Lewandoski. 2016. Designing the Business Models for Circular Economy—Towards the Conceptual Framework. Sustainability 2016, 8, 43; doi:10.3390/su8010043

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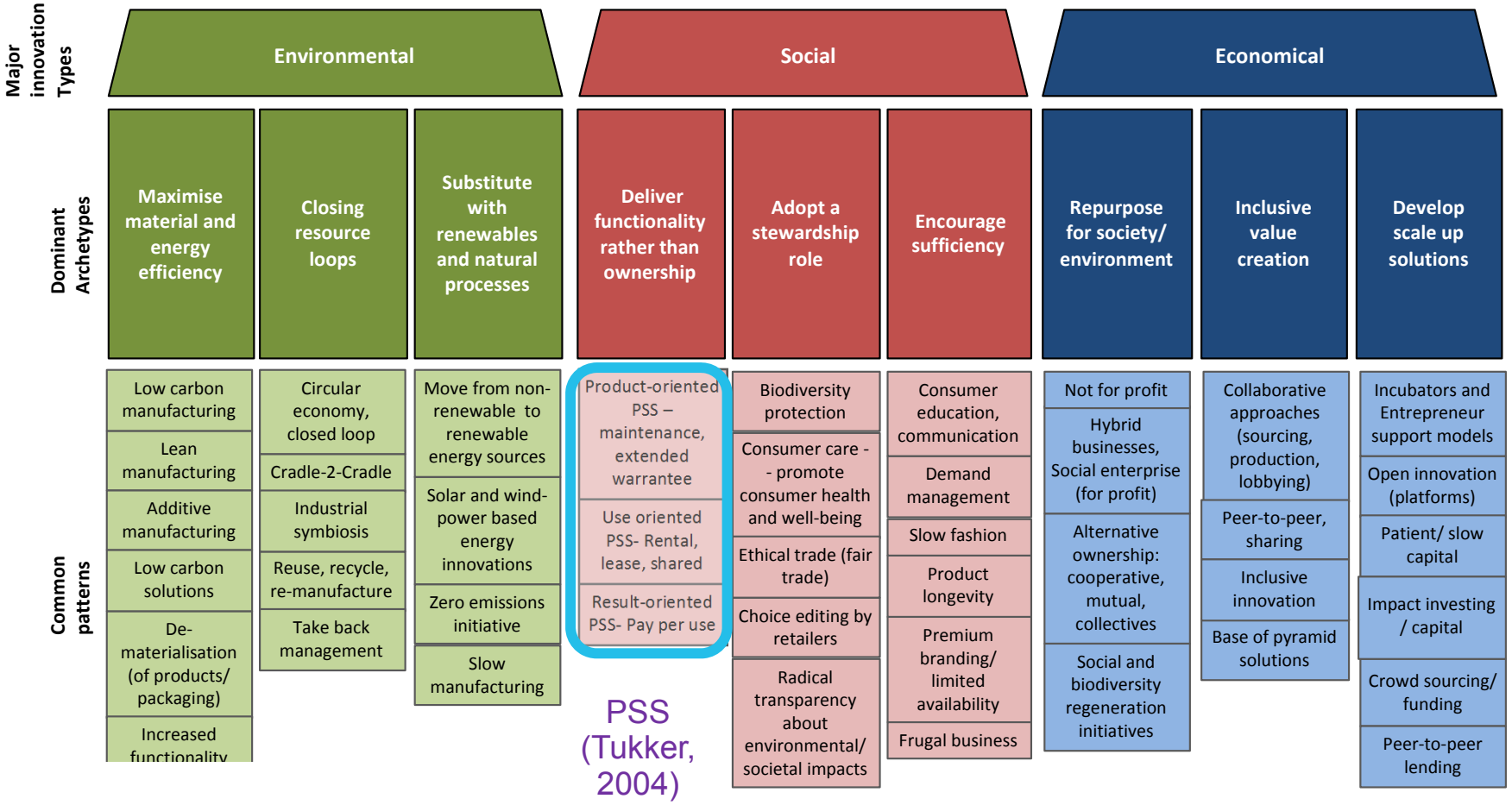
Sustainable business cases & archetypes



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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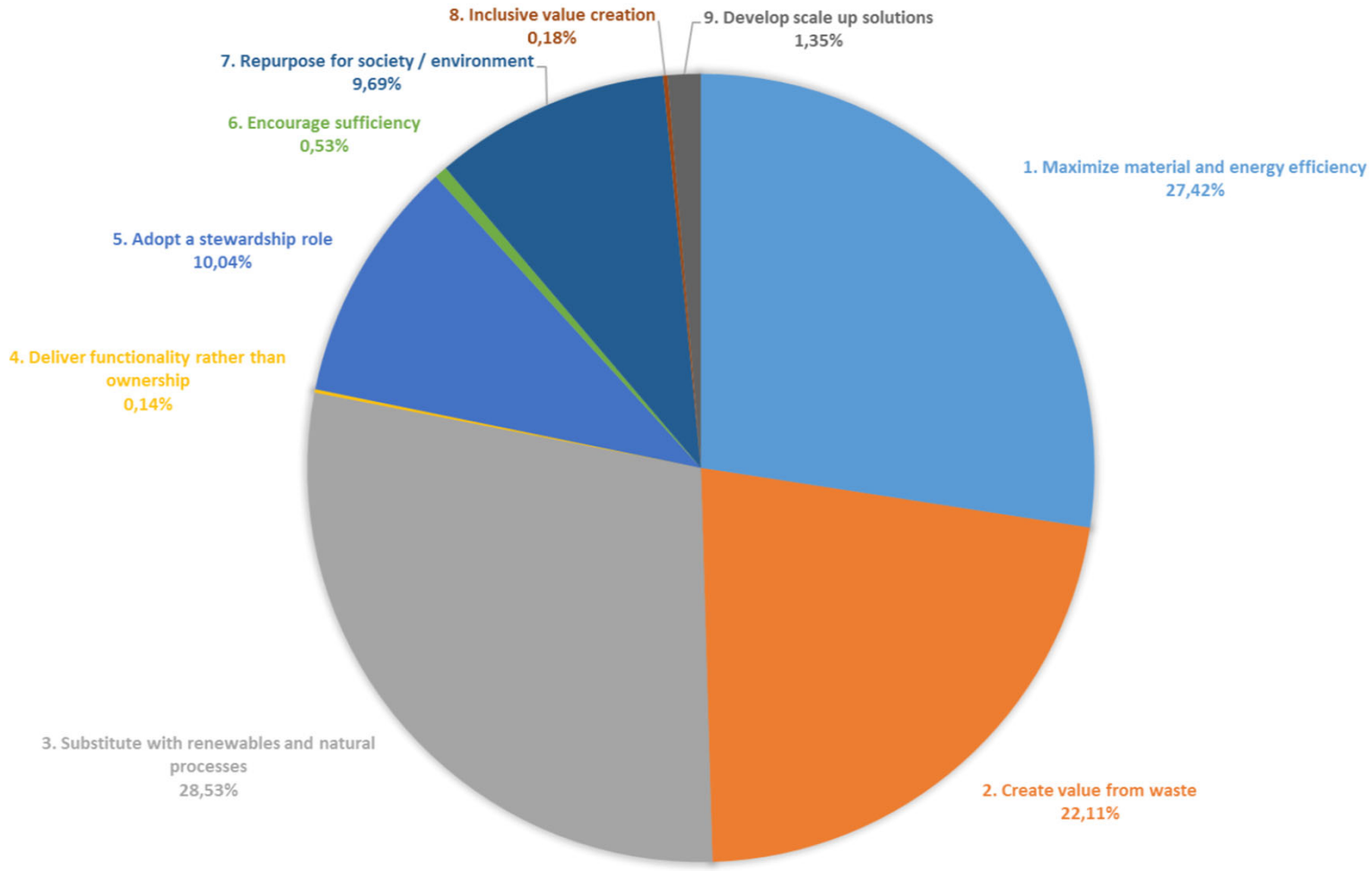
What happens in practice (S&P 500 study - sample of 101 firms)



Source:
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 model archetypes

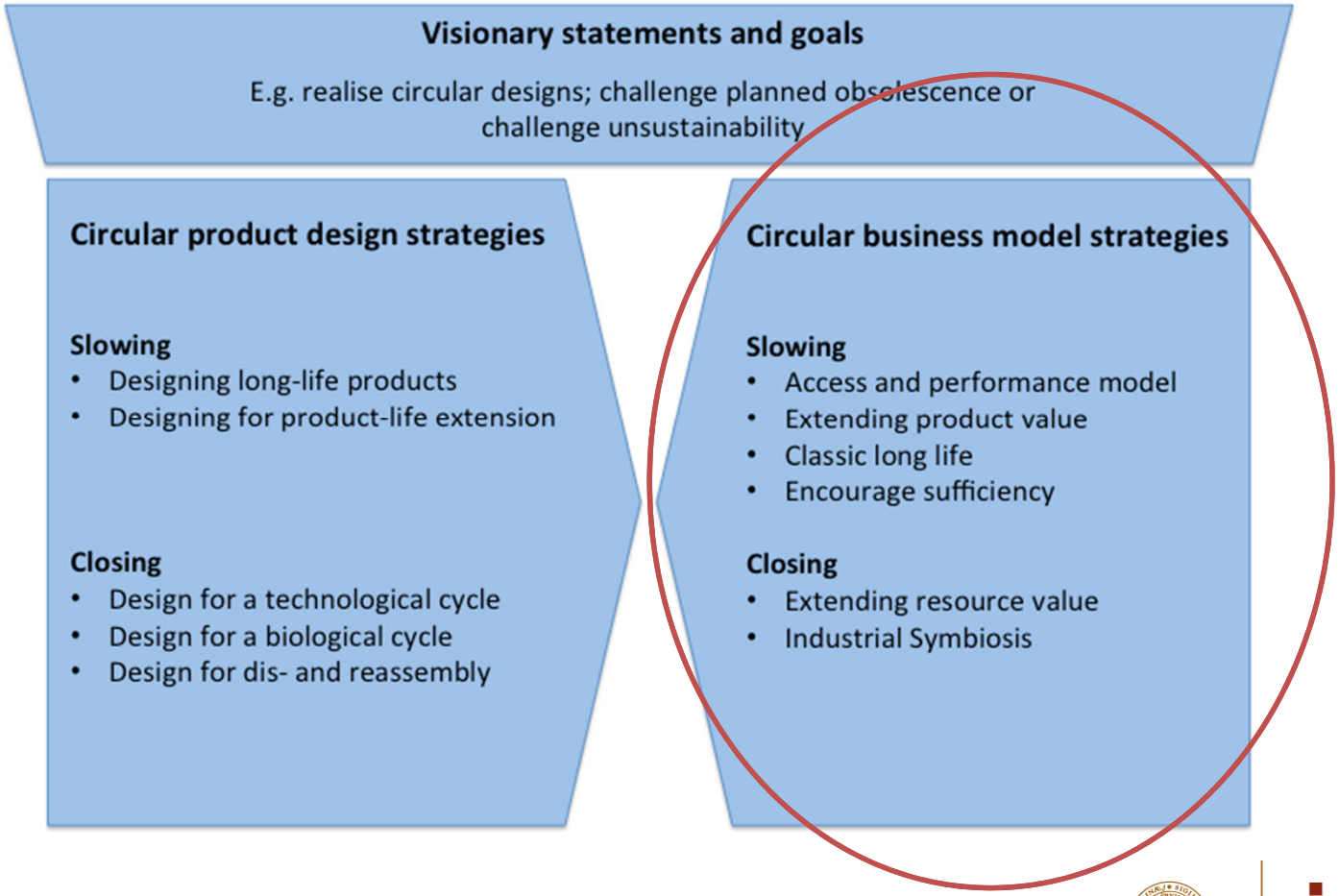

Figure: Circular strategies. Source: Bocken, N.M.P., de Pauw, I., van der Grinten, B., Bakker, C. 2016. Product design and business model strategies for a circular economy. J. Industrial & Production Engineering, 32 (1), 67-81.

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Slowing resource loops

VITSŒ

DON'T BUY THIS JACKET

Slow Food®

Campina pays producers to not produce milk

Source: Vitsœ, Patagonia, RTL news, Slowfood and Bugaboo websites

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Closing resource loops

Net-Works™

NIKE GRIND.

RAW FOR THE OCEANS

GRO

ReBlend

Source: NetWorks , RAW for the Oceans, Nike Grind, GRO, ReBlend, GrowUp and TU Delft Plakkies websites

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Closing resource loops

Wissington site: See www.britishsugar.com

Sources:

Short et al. (2014**)** From Refining Sugar to Growing Tomatoes. Industrial Ecology and Business Model Evolution, Journal of Industrial Ecology

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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Closing resource loops

SUGAR	
Bulk granulated	220kt
Bulk liquid	50kt
Liquid blends	10kt
Granulated bags	100kt
Caster bags	40kt

CO-PRODUCTS	
Animal feed	140,000 tonnes
Betaine	6,000 tonnes
Bioethanol	55,000 tonnes
CO2	40,000 tonnes
Electricity	500,000 MWh
LimeX	120,000 tonnes
Tomatoes	15,000 tonnes
TOPSOIL	150,000 tonnes
Aggregate	9,000 tonnes

Everything is transformed into sustainable products

Sources:

Short et al. (2014) From Refining Sugar to Growing Tomatoes. Industrial Ecology and Business Model Evolution, Journal of Industrial Ecology

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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Closing and slowing resource loops

COMMON THREADS INITIATIVE

REDUCE
WE make useful gear that lasts a long time
YOU don't buy what you don't need

REPAIR
WE help you repair your Patagonia gear
YOU pledge to fix what's broken

REUSE
WE help find a home for Patagonia gear
you no longer need
YOU sell or pass it on*

RECYCLE
WE will take back your Patagonia gear
that is worn out
YOU pledge to keep your stuff out of
the landfill and incinerator

REIMAGINE
TOGETHER we reimagine a world where we take
only what nature can replace

patagonia
patagonia.com

MUD JEANS®

LEASE A JEANS OR BUY A JEANS
RETURN THEM WHEN WORN OUT
WE RECYCLE
ALL MATERIALS

KYOCERA

auping

Source: Patagonia, Mud Jeans, Auping, Orange box, and Kyocera websites

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Product design and value chain perspective

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Multiple perspectives

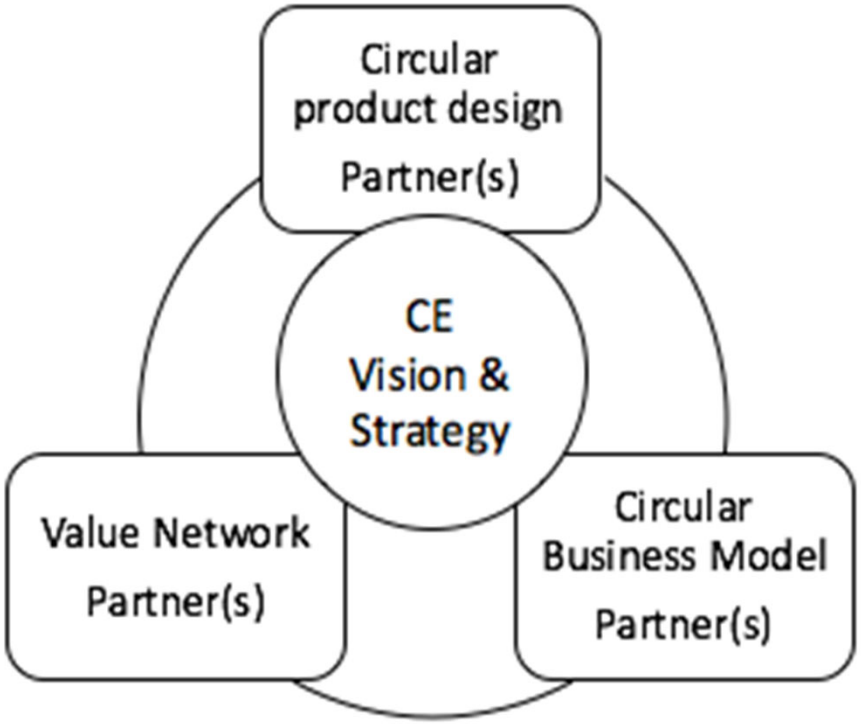

Figure: Conceptual framework for assessment of collaborative partners for circular product/service development Brown, P.D., Bocken, N.M.P., Balkenende, A.R. 2018. Towards understanding collaboration within Circular Business Models. Book chapter in 'Sustainable Business Models: Promise, Principles, Practice'

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Circular product design strategies

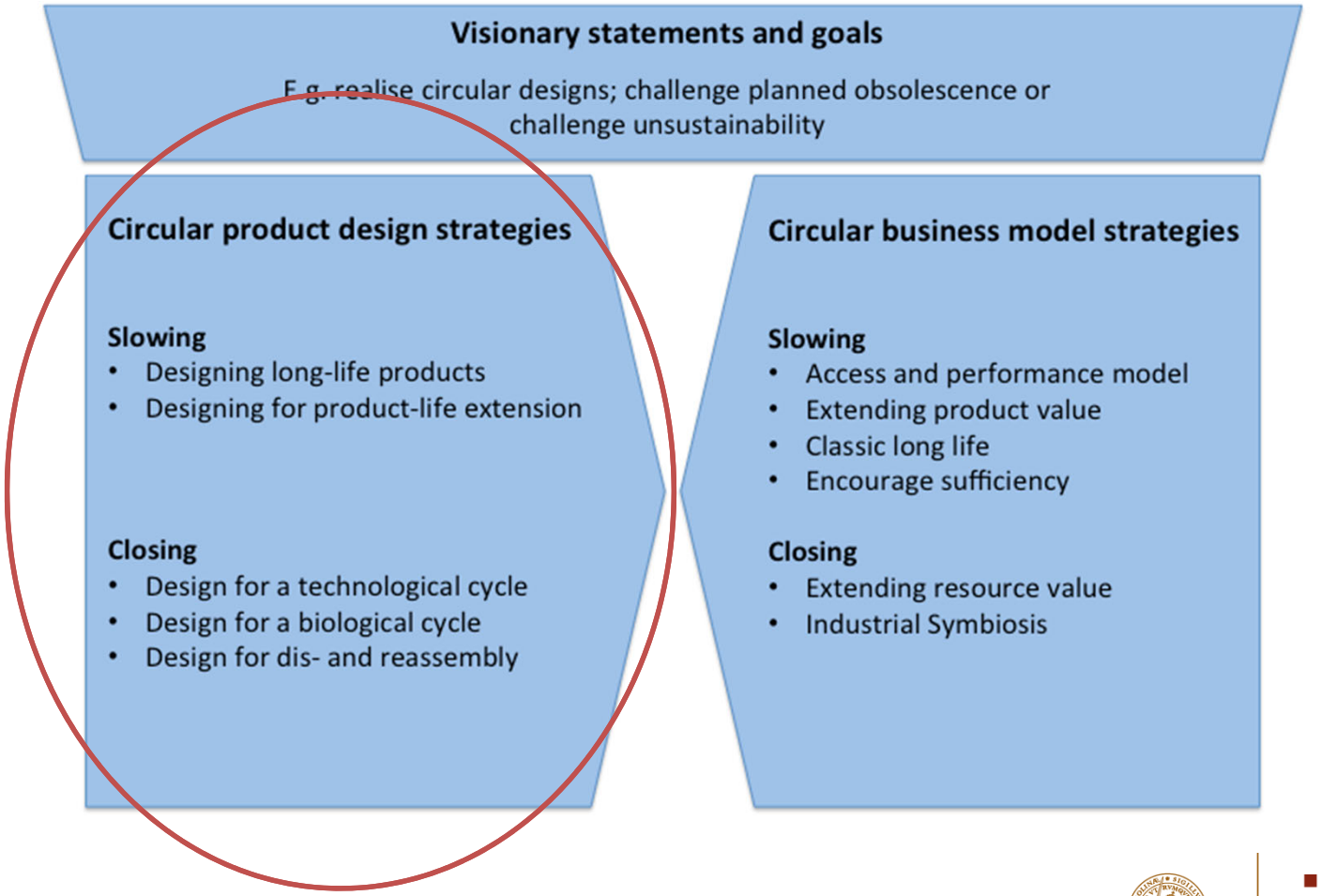

Figure: Circular strategies. Source: Bocken, N.M.P., de Pauw, I., van der Grinten, B., Bakker, C. 2016. Product design and business model strategies for a circular economy. J. Industrial & Production Engineering, 32 (1), 67-81.

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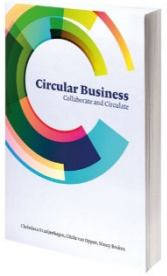
Circular strategies



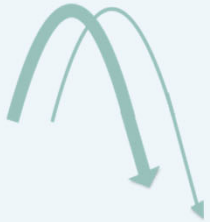
	RE strategy	Design strategy	Business model
	Closing resource cycles	Design for recycling Design for dis- and re-assembly	Industrial symbiosis Extending resource value Gap exploiters
	Slowing resource cycles	Designing long-life products; Service provision for product-life extension (e.g. repair, refurbish, upgrading)	Encourage sufficiency Classic long life Functionality, not Ownership Extending product value Gap exploiters
	Narrowing resource cycles	Design with fewer materials and less energy per product	Maximise material and energy efficiency Lean manufacturing models

Figure: Circular strategies. Sources: Kraaijenhagen et al. 2016. Circular Business. Available at: circularcollaboration.com
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.

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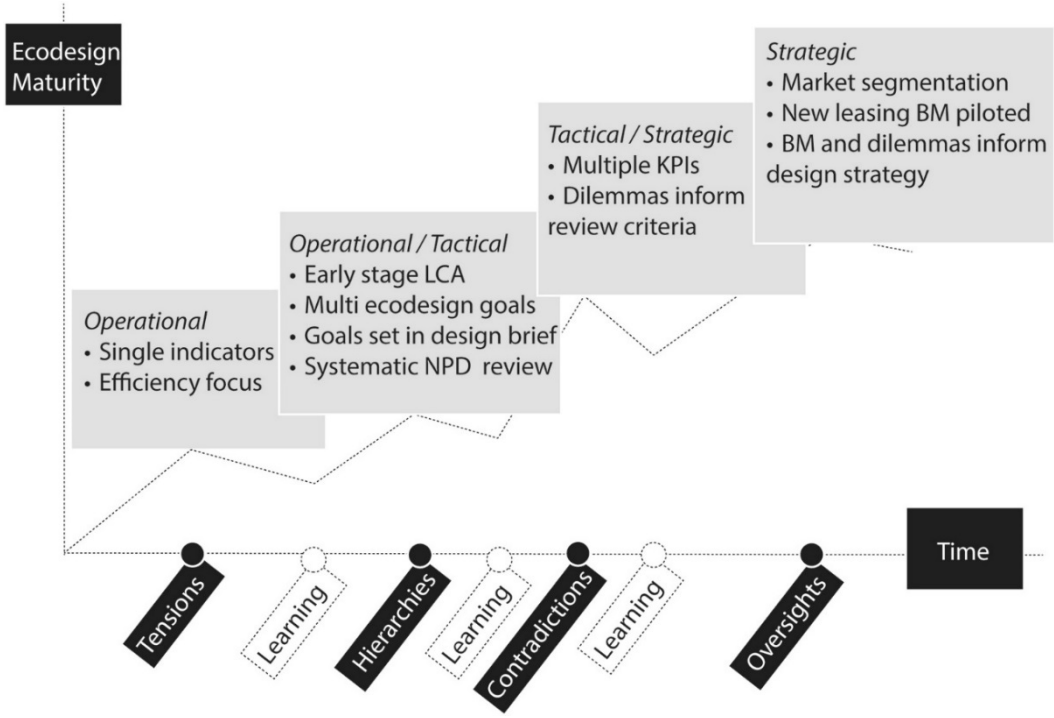
Circular product strategies: Orangebox



Figures: See: Prendeville, S., O'Connor, F., Bocken, N., Bakker, C. 2017. Uncovering ecodesign dilemmas: A path to business model innovation. Journal of Cleaner Production, 143, 1327-1399

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Circular product strategies: Philips

Environment: Reduce material use up to 80%
Cost: Price at 60-85% of the new system price

Figure: Philips HealthCare. www.remanufacturing.eu

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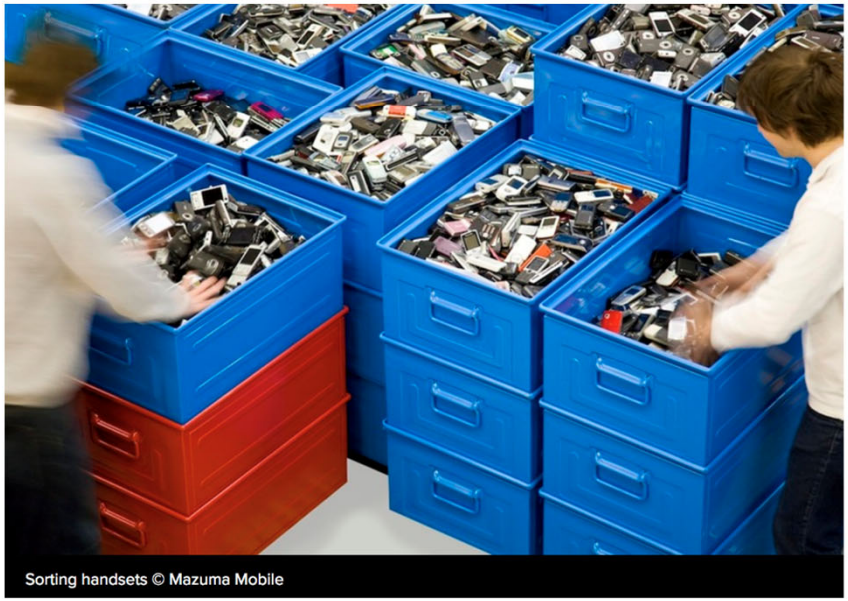
Circular value chains?

Mazuma Mobile is an online mobile phone reuse and recycling service allowing consumers to unlock the cash value of their mobile phones, offering same day payments. Collected handsets are refurbished by an external partner where necessary and then sold to partners in emerging markets, insurance dealers and retailers in UK.



Sorting handsets © Mazuma Mobile

Sources:
https://www.ellenmacarthurfoundation.org/circular-economy/building-blocks
https://www.ellenmacarthurfoundation.org/case-studies

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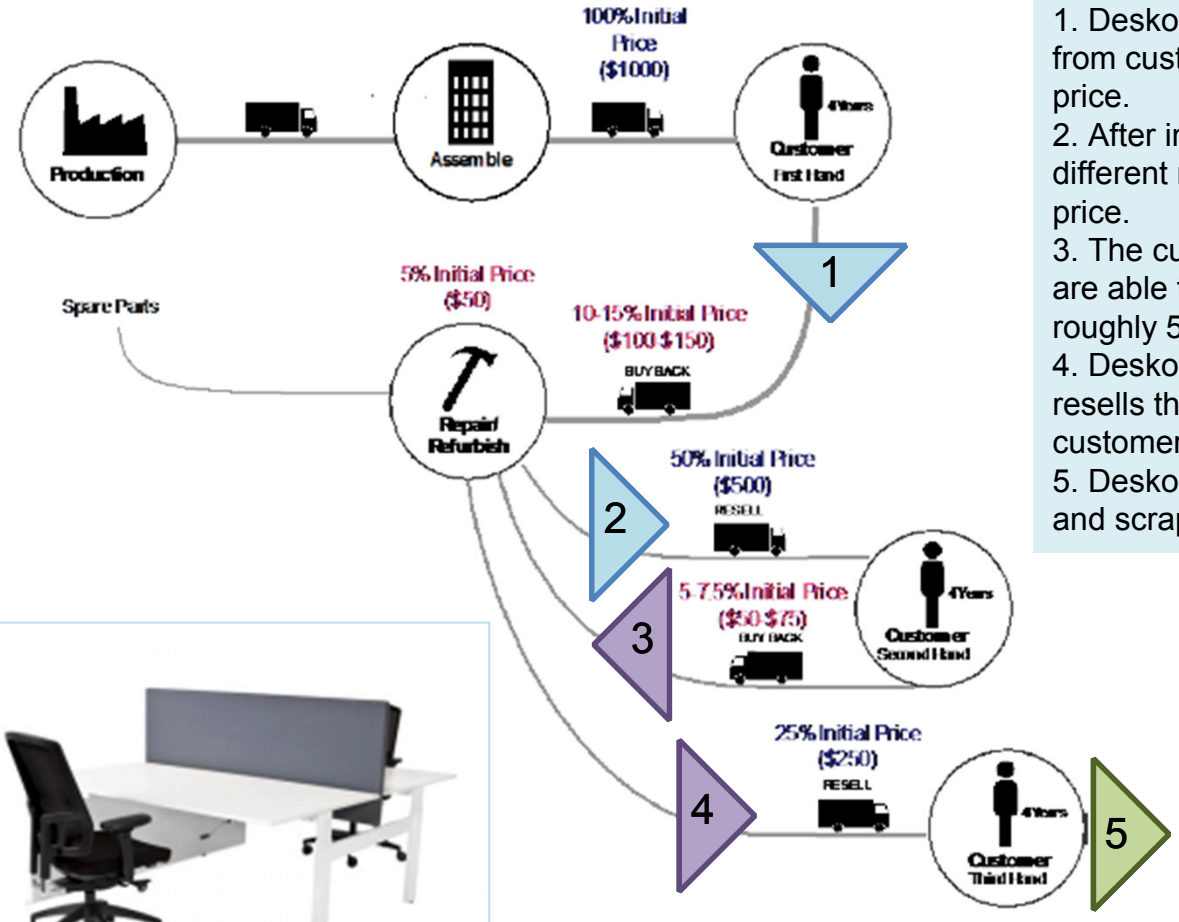
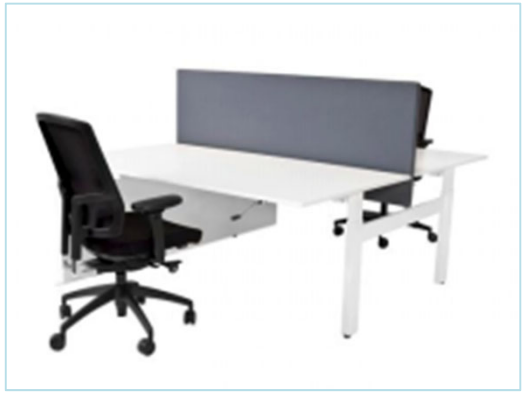
Circular value chains





1. Desko buys newly manufactured products back from customers at roughly 10% of the product's initial price.
2. After in-house remanufacturing desks are sold to a different market segment at roughly 50% of the initial price.
3. The customers of these remanufactured products are able to sell the desks back to Desko after use at roughly 5% of the product's initial price.
4. Desko remanufactures the desks once more and resells the product for the last time to a third customer segment at 25% of the original price.
5. Desko offers a free take-back for these customers and scraps the desks for parts.

Sources:
https://www.remanufacturing.eu/case-studies/desko-office-desks/

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Customer perspective

Circular offers and long product life

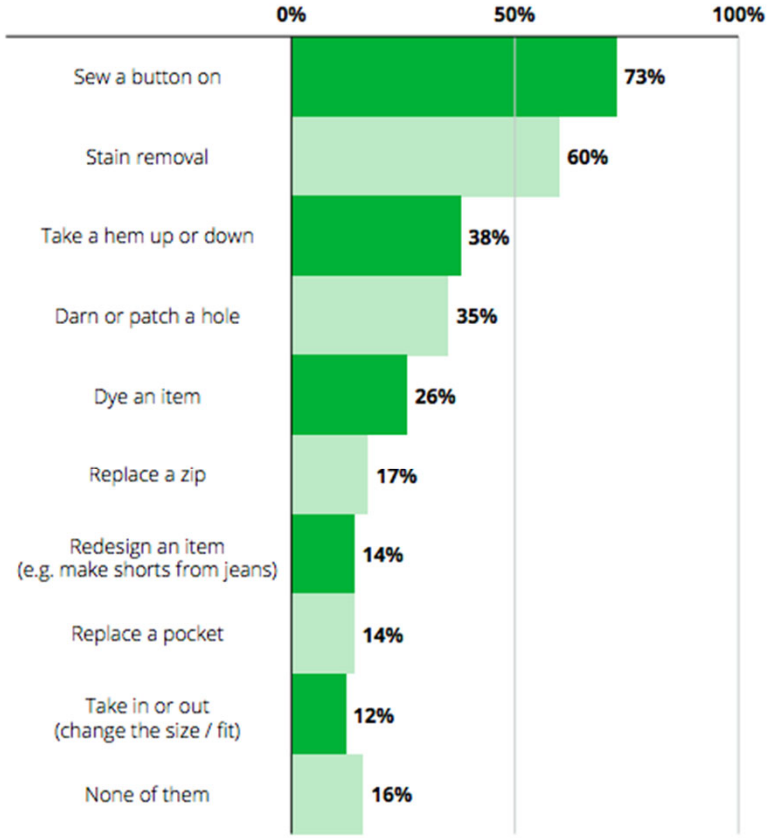

Figure 13: Shows the % of people that felt confident to perform repairs and alterations'

Base: Graph and box weighted to UK proportions - All (2,058) WRAP Textiles Tracker Survey 2016 wave 2

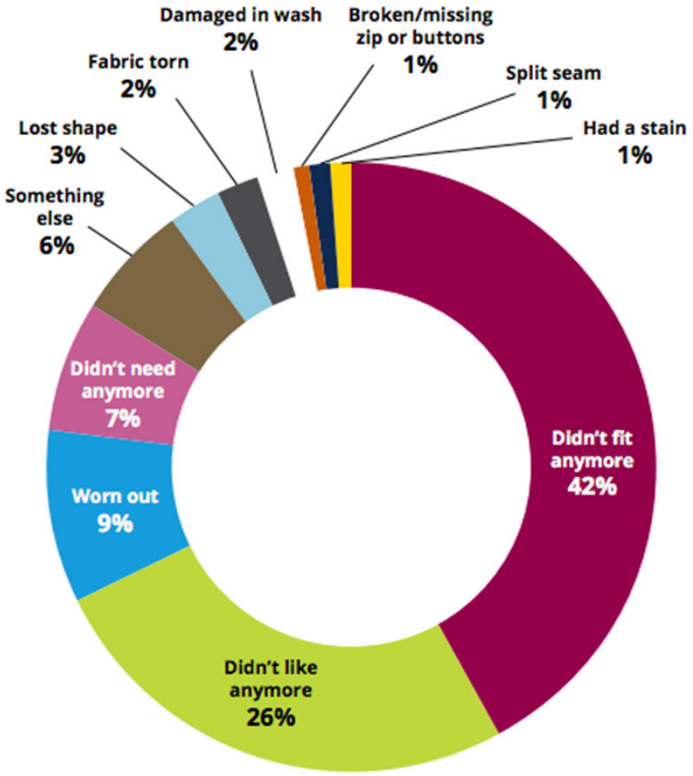

Figure 16: Reasons for choice of disposal routes for garments, on average, reported in a survey[xxi]

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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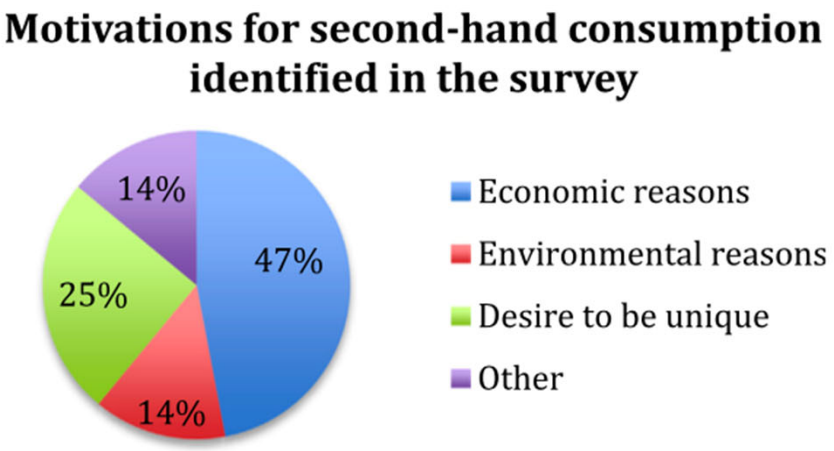
Circular offers and second hand



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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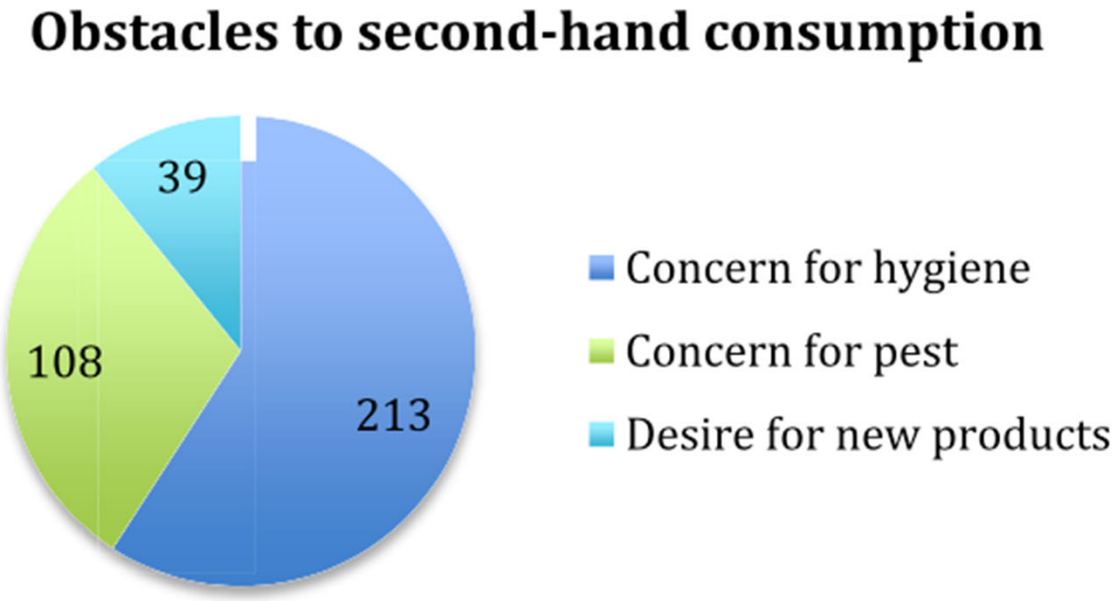
Second hand – obstacles



Study in collaboration with:

IKEA®

Pie chart: Exploring barriers 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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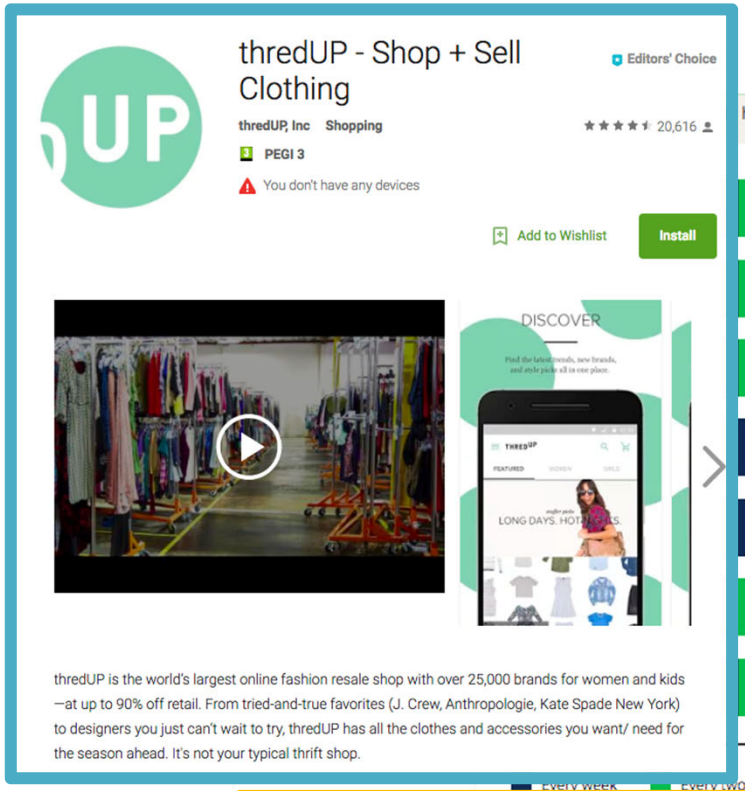
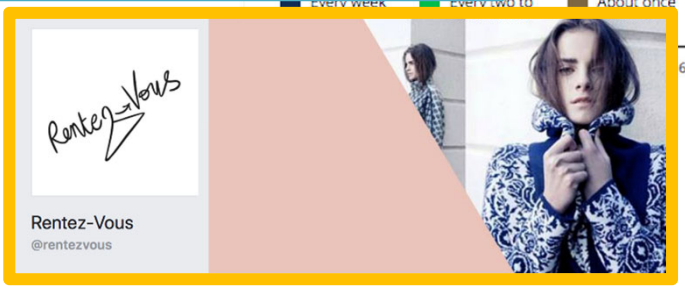
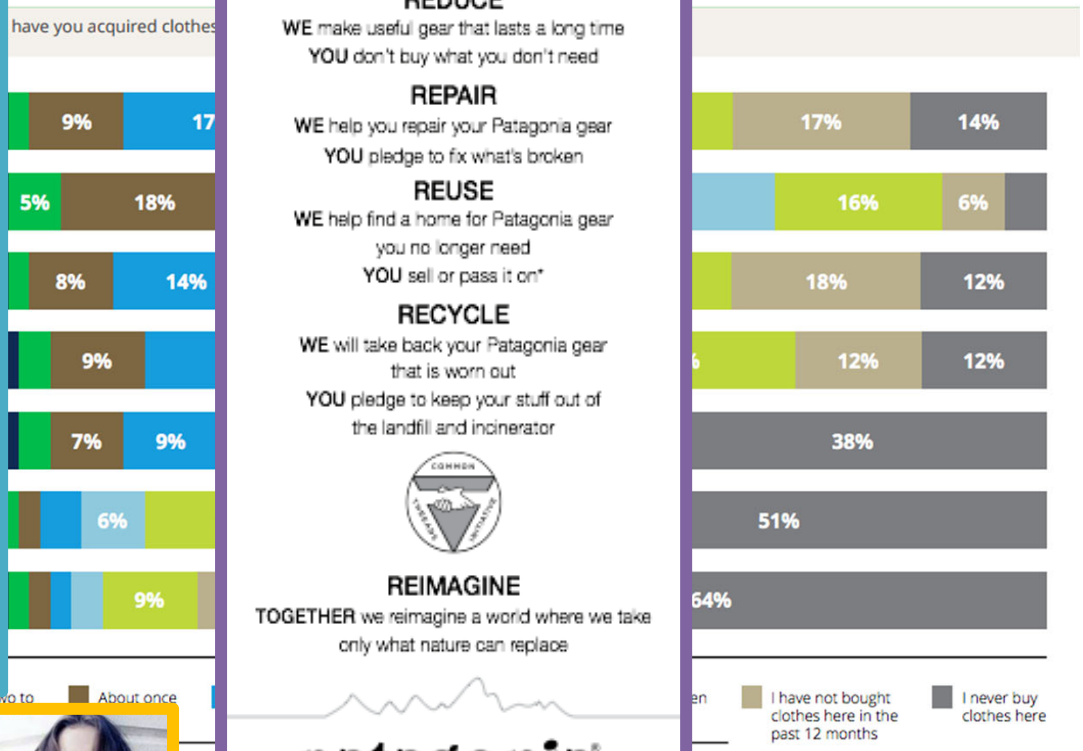
Circular offers and second hand







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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Implementation

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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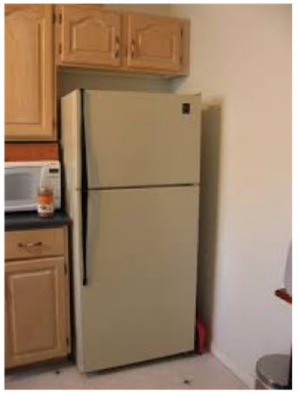
Old fridges
Is reuse a good option?

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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Optimal product lifespan

The point in time where the environmental impacts that arise from using a product equal the embedded impacts of a (more energy efficient) replacement product.

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 impact assessment

Circular business models do not by default reduce environmental impact, thus environmental assessment is fundamental

The most established tools are

- Material Flow Analysis
- Life Cycle Assessment

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Experimentation

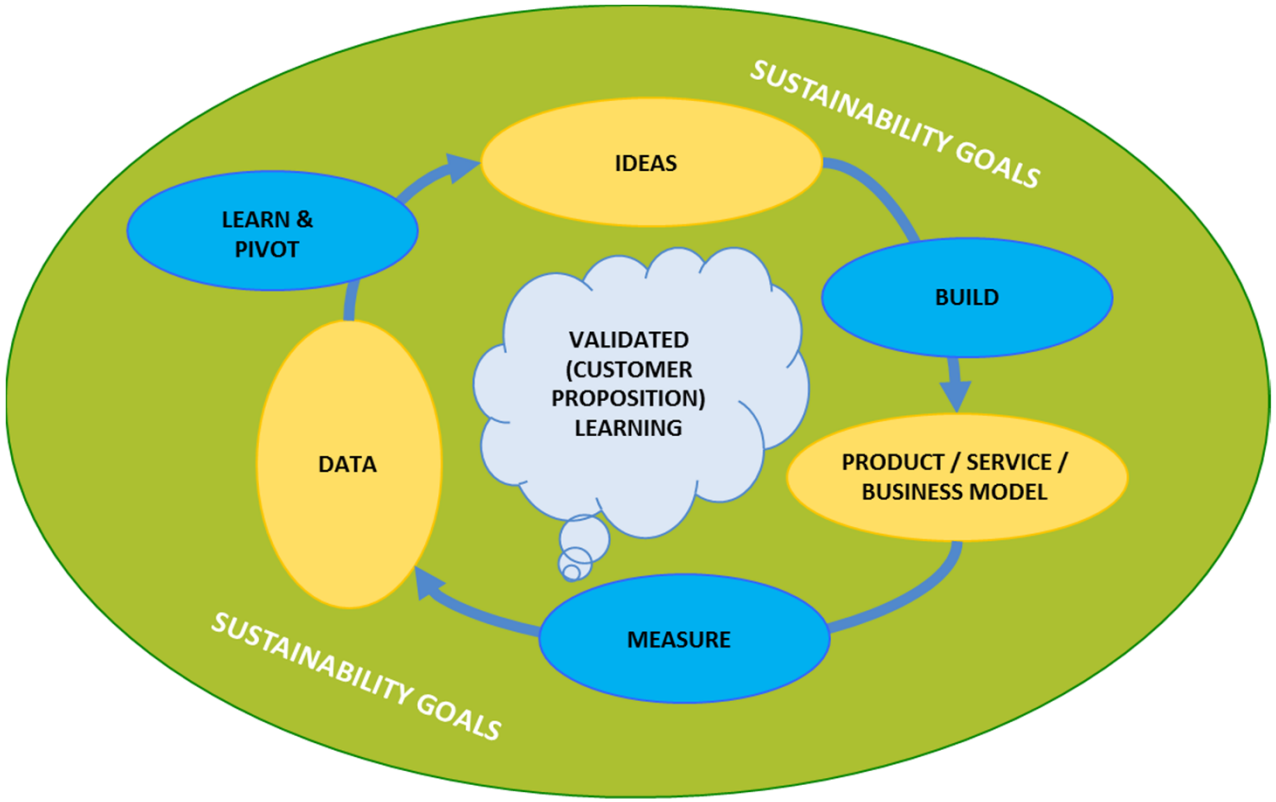
What is sustainable business experimentation?

- Business experimentation: explore the diverse possibilities that a business could create value from, or understand what works in which situations in a business context from a sustainability perspective
  - Sustainable business experiments consider Profit, People, Planet
  - Experiments cannot typically be controlled in a real business environment
  - Businesses deal with real customers and immediate business pressures

- Experiments have a fast-paced learning cycle and low resource requirements
- Think big, start small
- But start: Just do it!

Bocken, N., Schuit, C., Kraaijenhagen, K. (2018). Transitioning to sustainable businesses: exploring the role and process of circular business model experimentation through eight cases. Environmental innovation and societal transitions

Business model experimentation for Sustainability



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

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Business experimentation for the Circular Economy – some projects

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).

Circular Business
Collaborate and Circulate

CIRCULAR BUSINESS PROJECT

Circusol

ReBlend

CIRCUIT

ZERO BRINE

HOMIE

Strategic project:
Sharing Business Models
(Vinnova, Sweden)

Sharing Cities Sweden

A NATIONAL PROGRAM FOR THE SHARING ECONOMY IN CITIES

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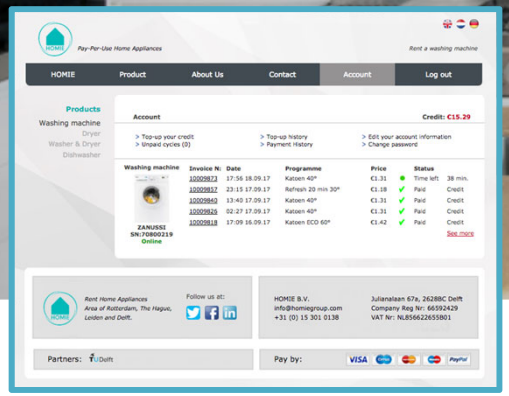
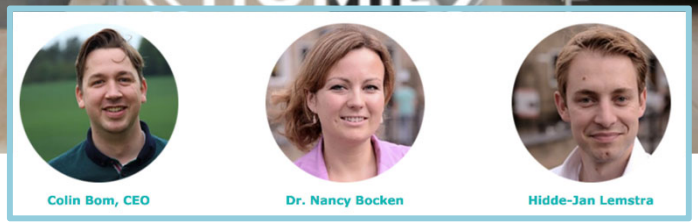
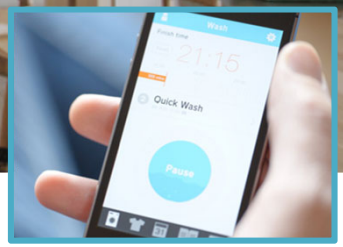
About HOMIE







- **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 €0,75 and a 90°C wash is €2,50

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

HOMIE
www.homiepayperuse.com

Source: www.homiepayperuse.com

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Business experimentation at HOMIE

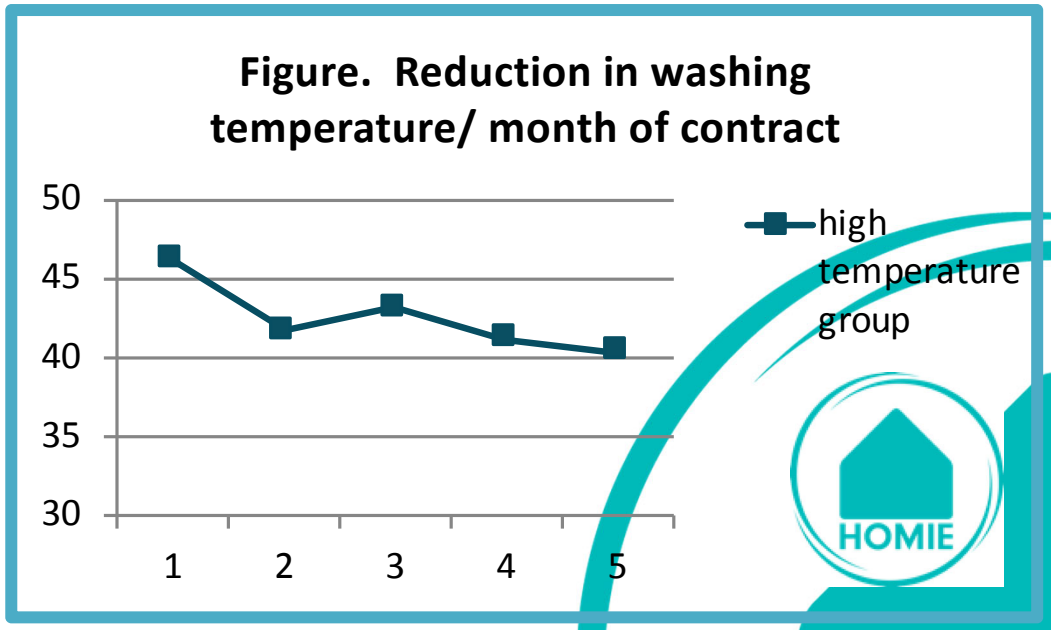
- *How can companies contribute to sustainable consumption through experimentation with new business models, and specifically 'pay per use' business models*?

- Experiments
  - Interviews
  - Free month
  - Paying per use
  - Providing information
  - Social comparison

- Focus in study: introducing paying per use after free month

Sources: Bocken, Mugge, Bom, Lemstra (2018). J. Cleaner Production

Results of the Business (model)



HOMIE

www.homiepayperuse.com

Sources: Bocken, Mugge, Bom, Lemstra (2018). J. Cleaner Production

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Exercise: develop a rapid experiment

- Your case company: Jaguar Land Rover (JLR), the UK's largest car manufacturer *

- **Current** (dominant) business model: selling petrol cars at the higher end of the spectrum directly to consumers
- **Future** business model: You want to create a Circular Business Model that closes and slows resource loops

- But where to start?
- Develop a rapid experiment!!!

* no direct project links with JLR but used as an example of car manufacturing

JAGUAR

LAND ROVER

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Exercise: develop a rapid experiment

- Your idea, e.g.: (5m)
  1. Move from product to service
  2. Establishing a car take-back system together with a retailer to make your own ‘’vintage” secondary market
  3. Set up a product sharing service for existing customers

Source: building on Osterwalder et al. 2014. Value proposition design

Exercise: develop a rapid experiment

- Your idea, e.g.: (5m)
  1. Move from product to service
  2. Establishing a car take-back system together with a retailer to make your own ‘’vintage” secondary market
  3. Set up a product sharing service for existing customers
- Identify your main hypothesis: We believe that: (Identify the *key critical* learning) (5m)
  1. Consumers will lease our most expensive products through a service contract
  2. Offering a reward will encourage tack-back
  3. There is a demand for sharing

Source: building on Osterwalder et al. 2014. Value proposition design

Exercise: develop a rapid experiment

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  1. Move from product to service
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  1. Consumers will lease our most expensive products through a service contract
  2. Offering a reward will encourage tack-back
  3. There is a demand for sharing
- Identify your test: To verify this we: (5m)
  1. Create a mock website for the leasing service
  2. Offer different rewards to different customers
  3. Create a mock website for the sharing service or set up a local experiment

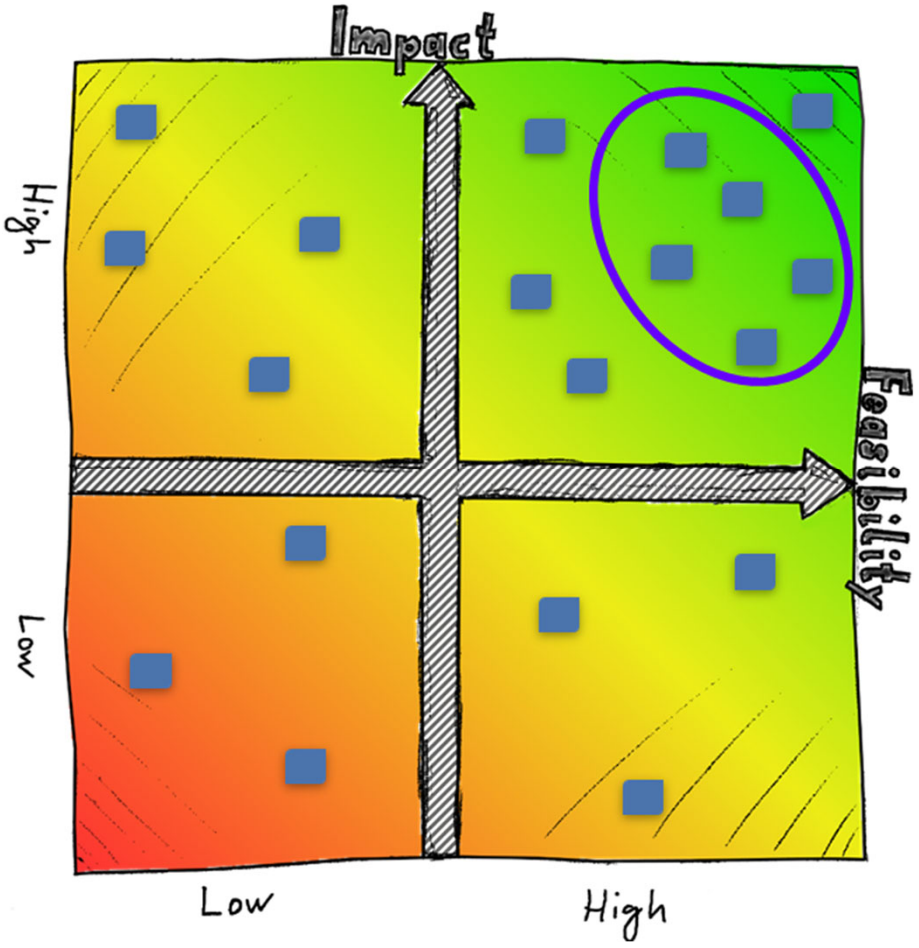
Source: building on Osterwalder et al. 2014. Value proposition design

Exercise: develop a rapid experiment *(we can try this in 15m in total)*

- Your idea, e.g.: (5m)
  1. Move from product to service
  2. Establishing a car take-back system together with a retailer to make your own ‘’vintage” secondary market
  3. Set up a product sharing service for existing customers
- Identify your main hypothesis: We believe that: (Identify the *key critical* learning) (5m)
  1. Consumers will lease our most expensive products through a service contract
  2. Offering a reward will encourage tack-back
  3. There is a demand for sharing
- Identify your test: To verify this we: (5m)
  1. Create a mock website for the leasing service
  2. Offer different rewards to different customers
  3. Create a mock website for the sharing service or set up a local experiment
- Measure: To analyse our “hypothesis” we will measure: (5m)
  1. The number of customers who click on the lease service
  2. The number of car collections from rewarded customers
  3. The number of customers who click on the lease service or join the experiment
- Criteria for success: set minimum targets for the numbers above (5m)

Source: building on Osterwalder et al. 2014. Value proposition design

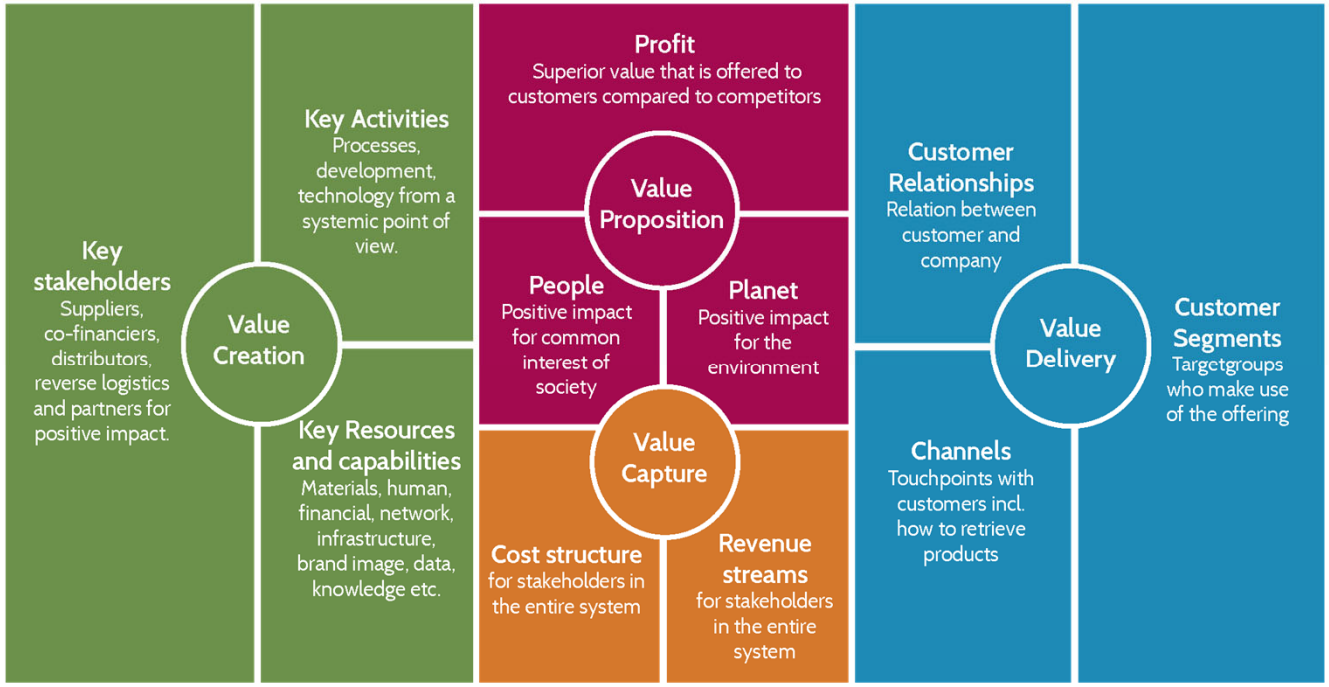
If you have multiple options/ rapid experiments…



- What seems **most feasible** (business side/ customers) and has the **most positive impact on circularity** (environmental)?

Source: Osterwalder et al. (2010)

Plan a potential experiment (5m)



- Experiment name?
- Experiment owners?
- Key activities and resources?
- Duration? Timelines?
- Budget?
- Who to involve?
- Risks, opportunities, dependencies

Source: Bocken (2015) developed from Osterwalder et al. (2010)

Ecologies of Business Models experiments

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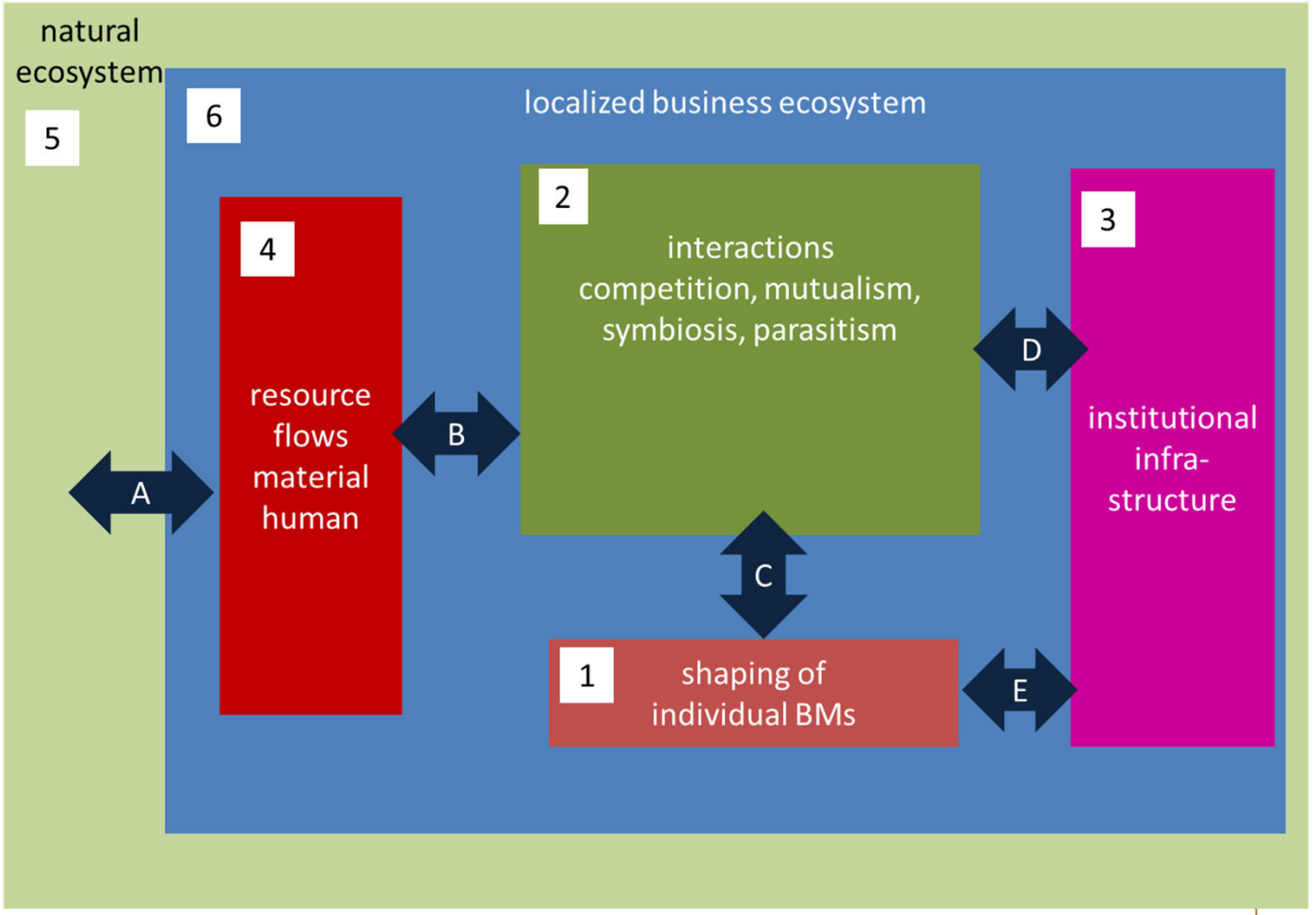
Business models are interlinked: Ecologies of business models



Ecology of business models. Boons, F., Bocken, N. 2017. Business models and the sharing economy: an ecosystem perspective. Product Lifetimes and the Environment (PLATE), 8-10 November 2017.

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Ecologies of business models – habitat of business models

step	Strategies/mechanisms	conditions
(a) Emergence of specific sharing BM	Joint learning Experimenting Designing Strategic niche management	-Availability of resources -Possibility for mutualistic connection to other BMs -Absence of competition for available resources
(b) Increased occurrence of specific sharing BM	Enrollment through marketing Enrollment through imitation	-potential user base and resource availability -absence of hype cycles
(c) Widening scope of sharing BMs	General promotion generalist BMs that are mutualistic with sharing BMs increasing returns imitation adoption by incumbents	-availability of supporting technological infrastructure
(d) Breaking down dominance of non-sharing BMs	-succesful shaping of infrastructure through political strategies -replacement of parasitic relationships with non-sharing BMs -pressure on keystone BMs	Lack of adaptive capacity of incumbents
(e) Change of habitat and input-output to system-environment		

Ecology of business models. Boons, F., Bocken, N. 2018. Towards a sharing economy – Innovating ecologies of business models . Technological Forecasting & Social Change 137 (2018) 40–52

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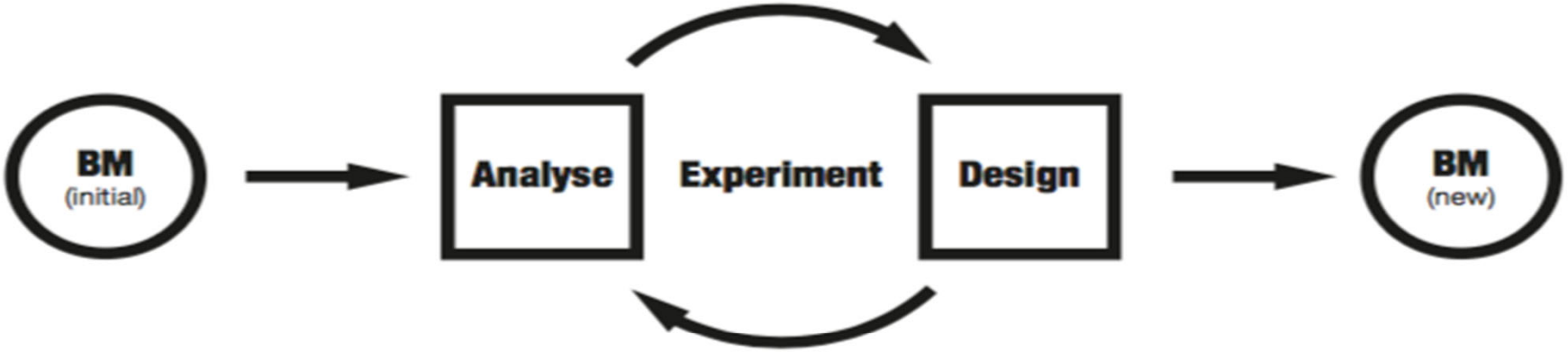
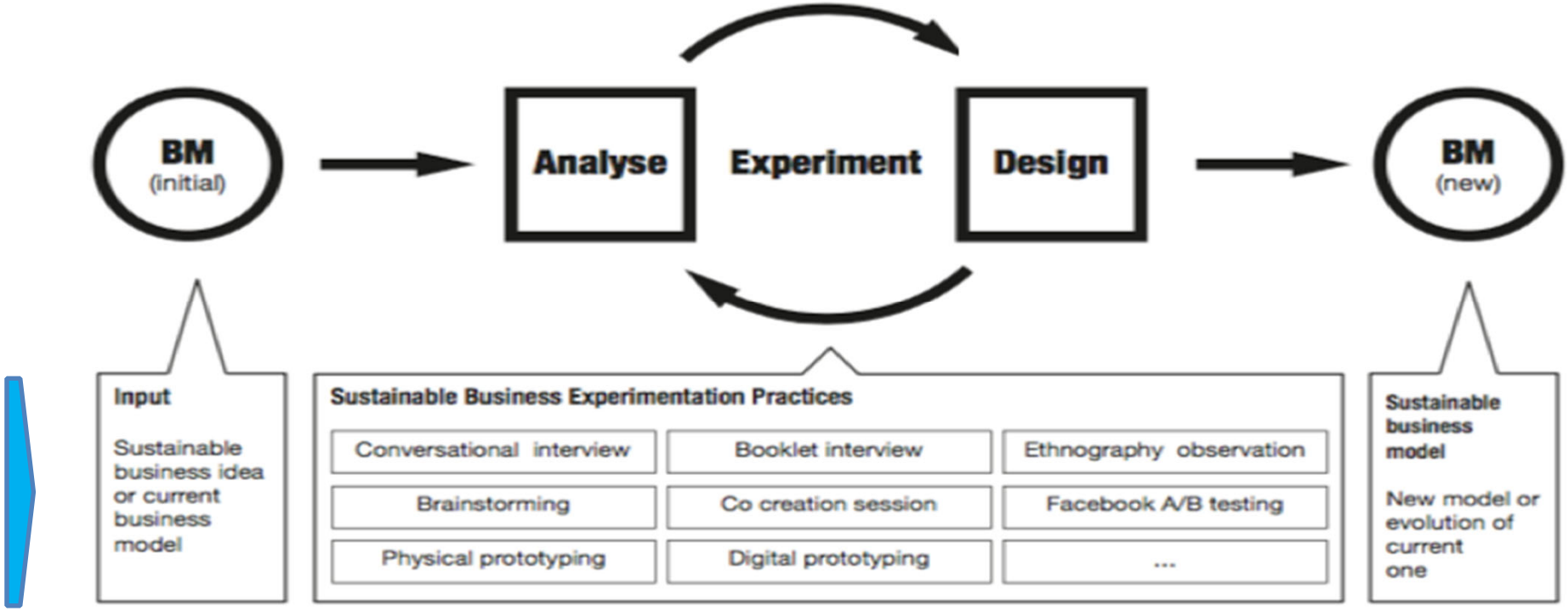
Lean start-up idea
(Ries, 2011)



Knowledge on experimentation practices



Bocken, N., Schuit, C., Kraaijenhagen, K. (2018). Transitioning to sustainable businesses: exploring the role and process of circular business model experimentation through eight cases. Environmental innovation and societal transitions

Schuit, C, Baldassare, B., Bocken, N. 2017. Sustainable business model experimentation practices: evidence from four start-ups. Product Lifetimes and the Environment (PLATE), 8-10 November 2017.

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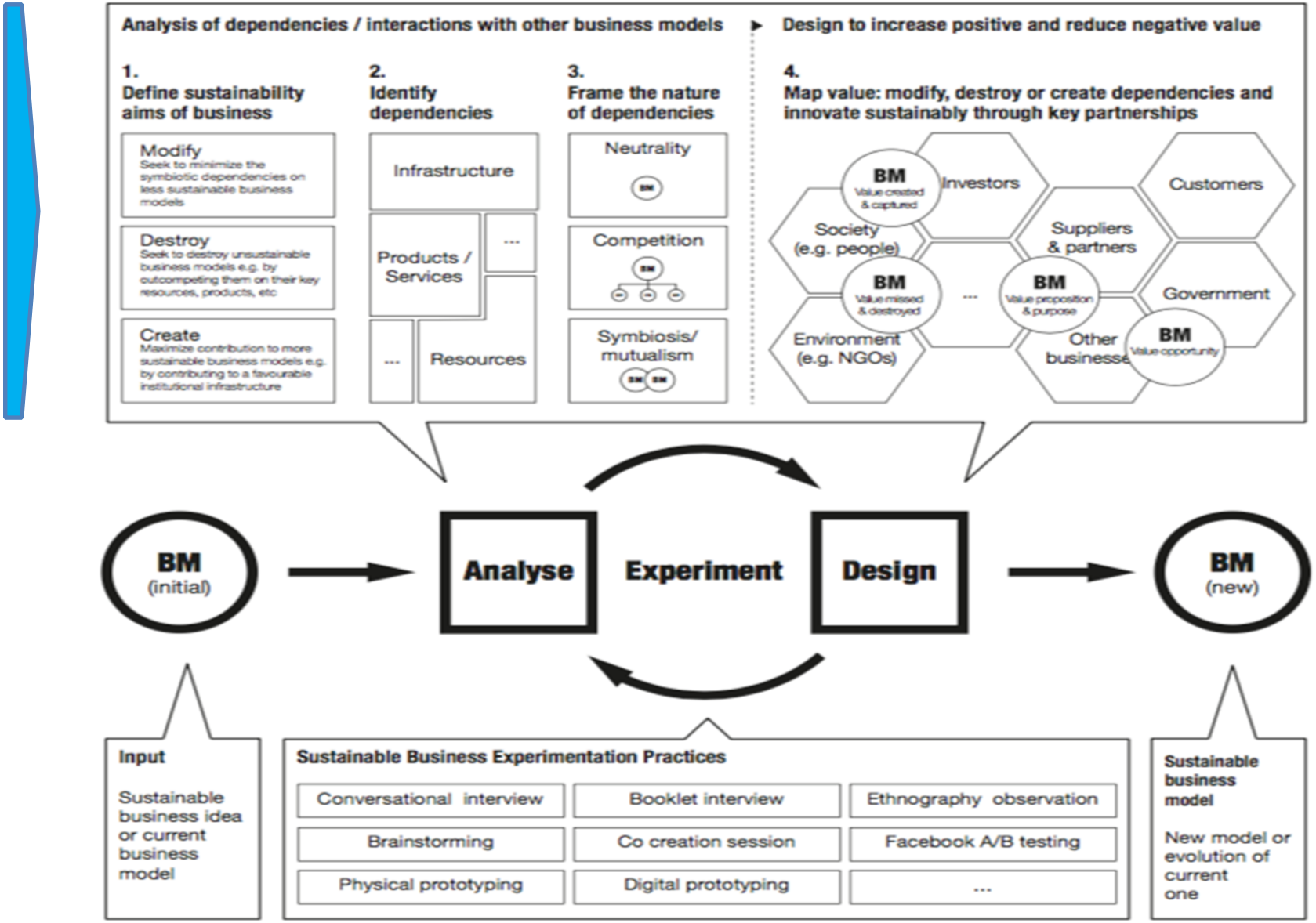
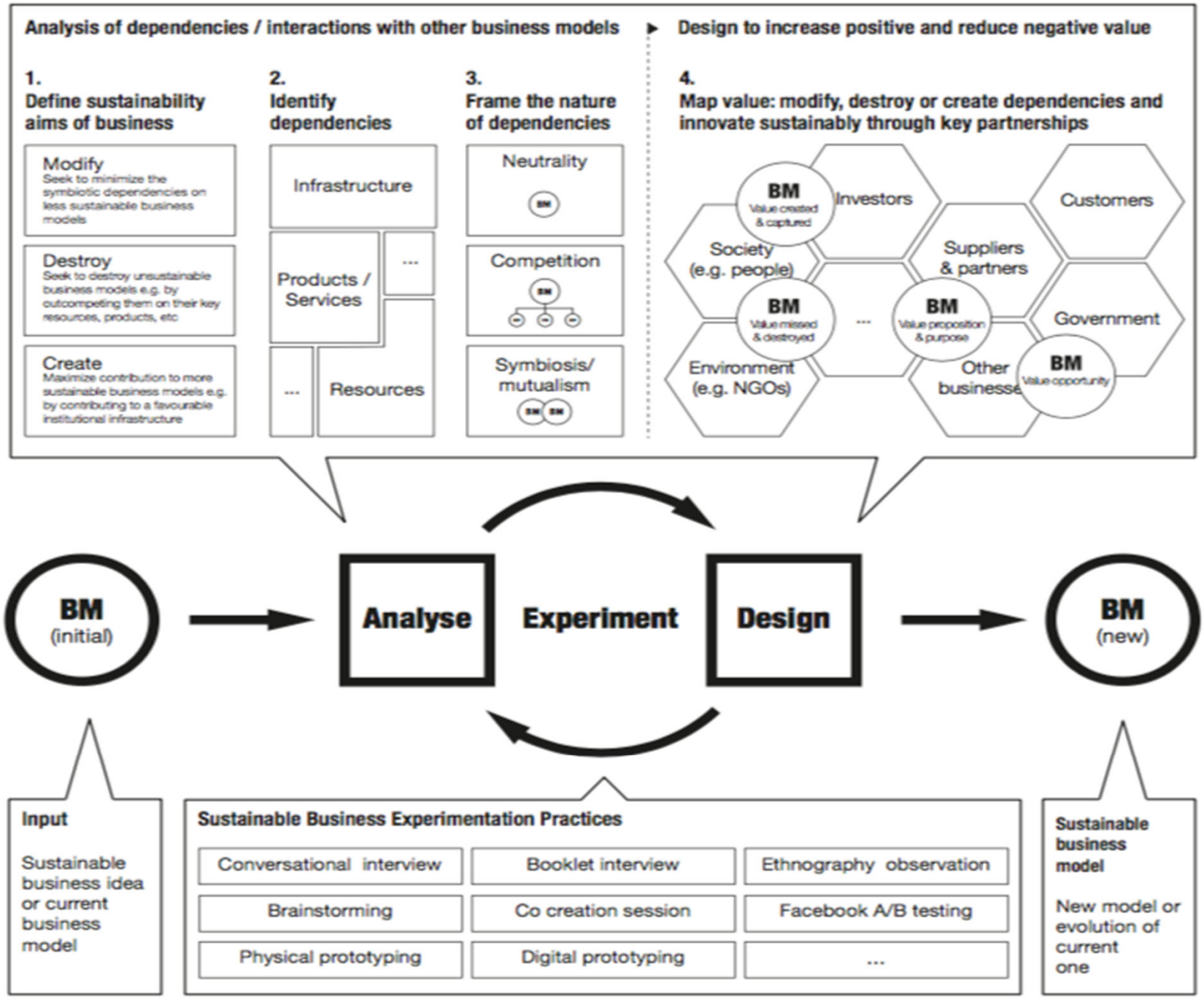
Plus ecologies of business models



Bocken, N., Boons, F., & Baldassarre, B. (2019). Sustainable business model experimentation by understanding ecologies of business models. Journal of Cleaner Production, 208, 1498-1512.


Analysis of dependencies / interactions with other business models
Design to increase positive and reduce negative value
1.
Define sustainability aims of business
Modify
Seek to minimize the symbiotic dependencies on less sustainable business models
Destroy
Seek to destroy unsustainable business models e.g. by outcompeting them on their key resources, products, etc
Create
Maximize contribution to more sustainable business models e.g. by contributing to a favourable institutional infrastructure
2.
Identify dependencies
Infrastructure
Products / Services
...
...
Resources
3.
Frame the nature of dependencies
Neutrality
Competition
Symbiosis/ mutualism
4.
Map value: modify, destroy or create dependencies and innovate sustainably through key partnerships
BM
Value created & captured
Investors
Customers
Society (e.g. people)
Suppliers & partners
BM
Value missed & destroyed
...
BM
Value proposition & purpose
Government
Environment (e.g. NGOs)
Other businesse
BM
Value opportunity
BM
(initial)
Analyse
Experiment
Design
BM
(new)
Input
Sustainable business idea or current business model
Sustainable Business Experimentation Practices
Conversational interview
Booklet interview
Ethnography observation
Brainstorming
Co creation session
Facebook A/B testing
Physical prototyping
Digital prototyping
...
Sustainable business model
New model or evolution of current one

Building on your earlier car idea

1. How does it Modify, Destroy or Create relations with (un)sustainable business models?
2. To what extent does the business model depend on others and how?
3. What is the nature of the dependencies?
4. How can positive value be increased and negative value reduced?
5. Any suggestions for new ideas based on this?
6. Would you trial another business model instead and how/ with whom?

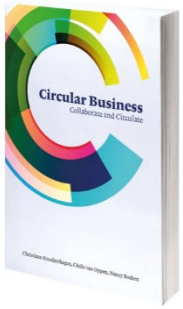
“The best way to predict the future is to invent it” (Alan Kay)

Circusol

HOMIE

ReCiPSS

Recipps.EU



Circular Business Models for the Solar Power Industry

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement 776680.

Homiepayperuse.com
@HOMIEPayPerUse (Twitter, Facebook)

Circular Business book available at:
www.circularcollaboration.com

CIRC€UIT

Marie-Sklodowska-Curie Innovative Training Network “Circ€uit” - H2020 Programme of the European Commission http://www.itncircuit.eu/

CIRCULAR BUSINESS PROJECT

https://circularbusinessproject.wordpress.com/

ZERO BRINE

Re-designing the value and supply chain of water and minerals.
This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under grant agreement No 730390.

Strategic project:
Sharing Business Models
(Vinnova, Sweden)

Sharing Cities Sweden

A NATIONAL PROGRAM FOR THE SHARING ECONOMY IN CITIES