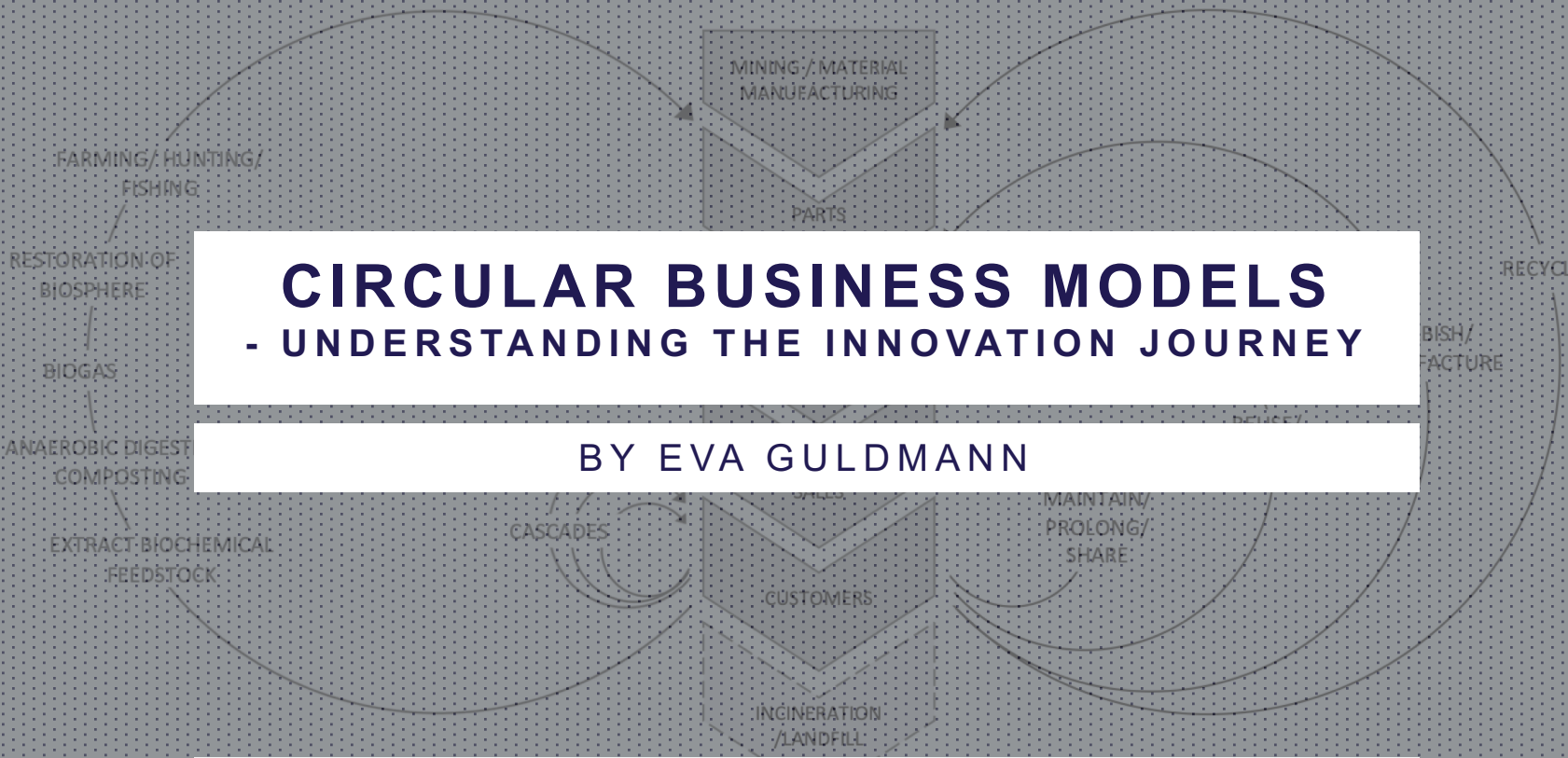


CIRCULAR BUSINESS MODELS

- UNDERSTANDING THE INNOVATION JOURNEY

BY EVA GULDMANN

PhD Course on Circular Economy, AAU, November 29, 2018

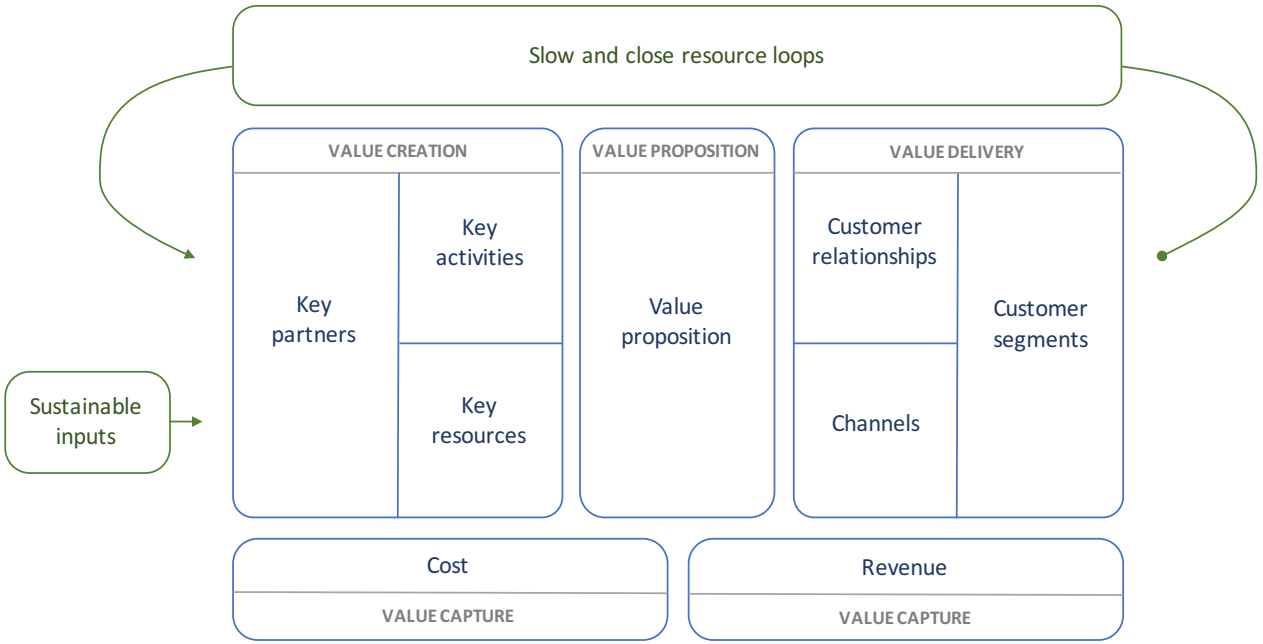
OVERVIEW OF PRESENTATION

- My background
- Research design
- Findings regarding two of the research sub-questions

- Questions and discussion most welcome!

BACKGROUND

- MSc in Engineering, Planning and Management
- 2014: Start of PhD in Circular Economy
- Guldmann, E., 2018. Circular Business Models: Innovation Journeys Towards a Circular Economy. PhD Dissertation, Aalborg University, Aalborg, Denmark.



Circular business model canvas by Guldmann and Remmen (2017). Synthesised from Osterwalder and Pigneur (2010), Richardson (2008), Bocken et al. (2016) and Ellen MacArthur Foundation (2013b).

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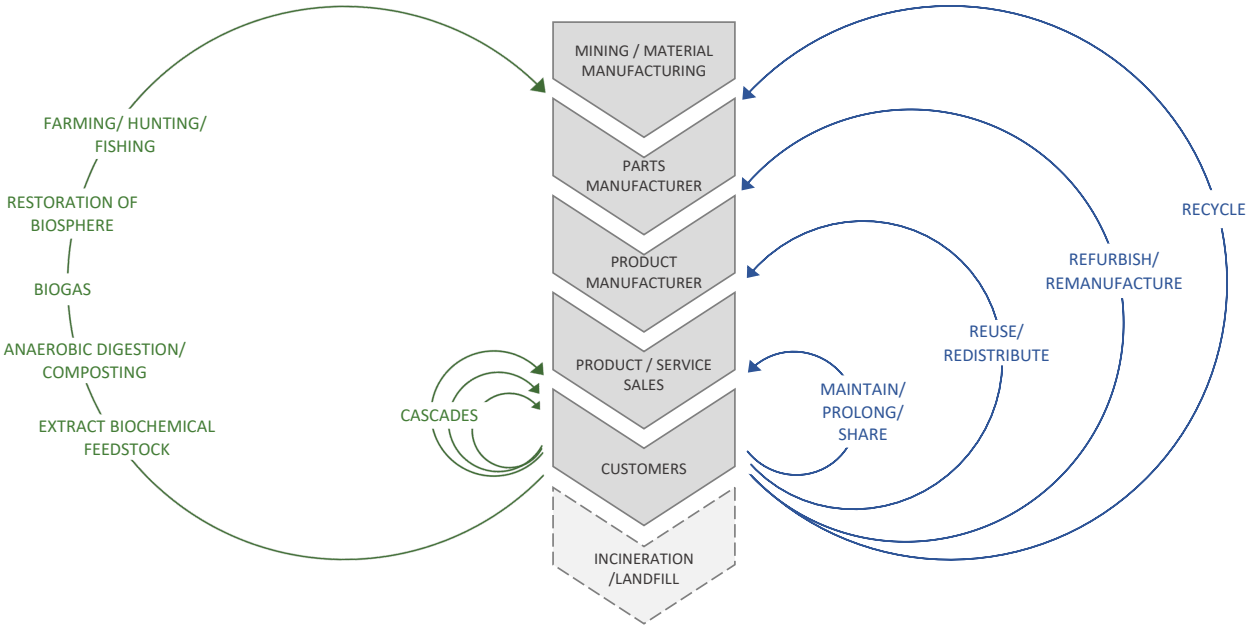
CIRCULAR BUSINESS MODELS

Circular business models (CBMs), are "(…) business models that are suited for the Circular Economy by incorporating elements that slow, narrow, and close resource loops, so that the resource input into the organisation and its value network is decreased and waste and emission leakage out of the system is minimised" (Geissdoerfer et al., 2018 referencing Bocken et al., 2016)



Circular economy system diagram. Adapted from Ellen MacArthur Foundation (2015).

CBM STRATEGIES

- Slow resource loops: Extend product/ component life or intensify use (Bocken et al., 2016; EMF, 2013)
- Close resource loops: Extend material life (Bocken et al., 2016; EMF, 2013)

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SHIFT IN BUSINESS LOGIC

one-time sales of goods

a continual flow of reused products or materials over time (Bakker et al., 2014a) and capitalising on the value embedded in used products (Bocken et al., 2016; Linder and Williander, 2017).

MAIN RQ

How can companies in different settings

engage in circular business model innovation?

Circular business model innovation = the process of generating ideas for circular business models, developing and testing these.

RESEARCH DESIGN

- 2 multiple-case studies
- Manufacturing and wholesales companies -> design and manufacture physical products
- Action research
- Data collection
  - Unstructured interview
  - Participant-observation
  - Documents
  - Semi-structured interviews

CASE COMPANIES

- 7 primary and 6 secondary case companies
- Start-ups, small, medium-sized and large companies
- Different industries
- Different sustainability ambitions

Name of research project	Closing Material Loops	Business Models for Sustainable Production
Timing	2014–2016	2016–2018
Primary case companies	Schilder and Brown	-
	Grundfos	-
	Danfoss	Danfoss (cont.)
	Kuvatek	Kuvatek (cont.)
	KnowledgeCotton Apparel	KnowledgeCotton Apparel (cont.)
	Gabriel	Gabriel (cont.)
	-	A Man of Value
Secondary case companies	Siemens Wind Power	-
	AVV	-
	-	Better World Fashion
	-	Mogens Hansen Møbler
	-	Everrest
	-	Højer Møbler
Number of case companies	6 primary 2 secondary	5 primary 4 secondary

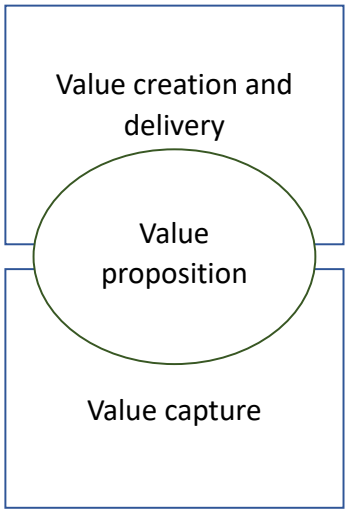
DATA ANALYSIS

- Primarily inductive
- Research sub-questions arose from the data:

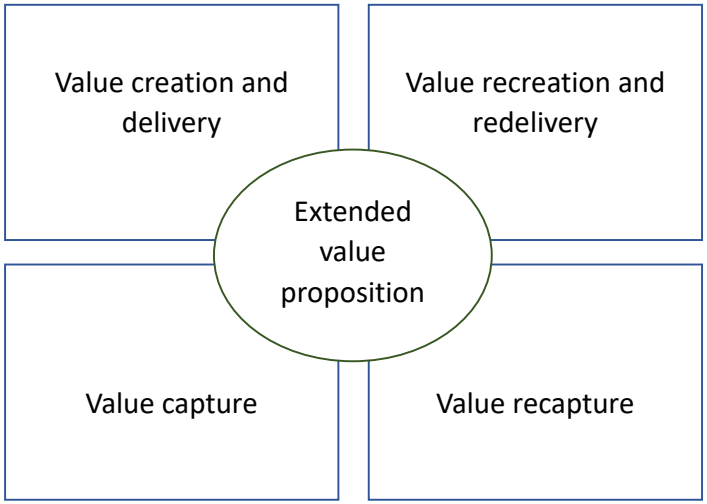
1. What are the barriers to circular business model innovation?
2. What could a design thinking framework tailored to circular business model innovation look like and what is the potential impact of such a framework?
3. How does the company setting affect the circular business model innovation process?
4. How can circular business model innovation activities support the overall organisational journey towards circular economy?

RESEARCH SUB-QUESTION:

What are the barriers to circular business model innovation?



Key elements of a linear business model (Richardson, 2008).



Key elements of a circular business model. Developed in Guldmann (2018) from Richardson (2008) and Bocken et al. (2016).

COMPLEXITY OF CBMS

- Extending the responsibility of companies
- Shift in business logic
- A business model design for each product life cycle (Nussholz, 2018)

Value recreation mechanisms	Value redelivery and recapture enablers	Elements of an extended value proposition for customers
	Slow resource loops	
Extend product/ component life or intensify use	- Product design that supports emotional and technical durability - Product-life extending services or servitization - Reverse logistics	- Longer product life/ higher level of technical function - A more sustainable product - Lower price or up-front investment - Economic bonus upon product return
	Close resource loops	
Extend material life	- Product design that enables recycling - Recycling services - Reverse logisitics	- Cost efficient/profitable disposal of used products - Sustainable handling of waste. - Lower price of products

Excerpt of table from Guldmann (2018) extended from Bocken, Bakker, de Pauw and van der Grinten (2016)

Institutional level	CBMI lit.	RI lit.
Regulatory barriers	4, 5, 6	a
Low price of virgin raw materials compared to recycled materials	1	a
Difficulty securing funding for circular business models	7, 8	b, c
Market demand unclear	17, 18	g, h
Public procurement policies not sustainability-oriented	2, 3	a
Value chain level		
Investments in existing manufacturing facilities and value chain	-	f
Concerns about quality control of returned goods	14	i, f
Concerns about consistency of flow of returned goods	15	i
Dispersed, complex value chains	13, 26	f
Reluctance to involve external stakeholders in CBMI activities	-	h, j
Takes time to build new partnerships and mutual trust	11	d
Lack of knowledge or competencies in value chain	10, 24	d

Organisational level	CBMI lit.	RI lit.
Narrow focus of existing sustainability strategies	28	l
Difficulty attaining management buy-in	23	l
ROI and similar requirements for new business ventures	9, 19, 20	i
Cannibalisation concerns	21	i
Little evidence of financial and/or environmental benefits	20	i
Lack of resources, knowledge or competencies in-house	8, 24, 25, 27	j, k
Uncertainty about legislation in this field	27	j
Difficulty establishing cross-organisational collaboration	-	l
Special product design requirements	12, 22, 30, 31	i, e
Employee level		
Lack of knowledge about CE and CBMs	24	j
Lack of commitment to promoting the CE agenda	-	l
Prevailing linear business model structures and thinking	28, 29	j
Incentive structure supporting linear business models	29	l

Guldmann (2018)

CBMI barriers		
	Description	**Selected references**
1	Lack of concrete, coherent, strict legislation	Rizos et al. (2016)
2	No government support in the form of training, funding, legislation. No clear place to go for help and long procedures to obtain certifications etc.	Kuo et al. (2010); Rizos et al. (2016)
3	Lack of supportive public procurement policies	Rizos et al. (2016)
4	Taxation of labour rather than raw materials renders labour intensive reuse and recycling activities expensive	Stahel (2010); Kissling et al. (2013)
5	Legislation hinder CBMs, e.g. legislation on sales of waste materials and on cross-border movement of products for reuse	Singh and Ordoñes (2016); Milovantseva and Fitzpatrick (2015); Mont (2002); King et al. (2006)
6	Warranty legislation hinders the use of reused spare parts	Riisgaard et al. (2016)
7	Lack of external funding opportunities	Rizos et al. (2016)
28	Fundamental shift in corporate culture, policies and market engagement is needed that also demand internal reorganisation. Resistance to change.	Mont (2002; 2006); Rizos et al. (2016); Kuo et al. (2010); Besch (2005); Ravi and Shankar (2005)
29	Traditional incentive structures and performance metrics are inappropriate to support new business models	Mont (2002); Ravi and Shankar (2005)
30	Repairs impaired by proprietary product designs, parts glued together and other physical product attributes	Riisgaard et al. (2016); Krystofik et al. (2015)
31	Products and buildings are complex and not designed with EoL reuse or recycling in mind resulting in a low value at EoL	Singh and Ordoñes (2016); Adams et al. (2017)

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LITERATURE REVIEW

- Barriers to CBM adoption from CE literature and from related streams of literature:
- Literature on product-service systems, remanufacturing, resource efficiency improvements and green supply chain management, among others

Can you recognize these/similar barriers from your research?

In your experience, are any barriers missing?

	A	B	C	D	E	F	G	H	I	J	K	L	
Institutional level													19
Regulatory barriers		x											1
Difficulty securing funding for circular business models	x	x			x		x	x					5
Market demand unclear	x	x			x	x		x	(x)		x		7
Public procurement policies not sustainability oriented			x	x			x						3
Low price of virgin raw materials compared to recycled materials				(x)	x				(x)				3
Value chain level													36
Investments in existing manufacturing facilities and value chain					x			x	x	(x)	x		5
Concerns about quality control of returned goods					x		x		x		(x)		4
Concerns about consistency of flow of return goods		x					x		x		x		4
Dispersed, complex value chains	x								x	x	x		4
Reluctance to involve external stakeholders in CBMI activities			(x)			x	(x)		x		x		5
Takes time to build new partnerships and mutual trust	x	x	x		x	x	(x)	x	x		x		9
Lack of knowledge or competencies in value chain	x	x			x		x	x					5
Organisational level													52
Narrow focus of existing sustainability strategies				x		x			x	x	x	x	6
Difficulty attaining management buy-in		x			x			x	x		x	x	6
ROI and similar requirements for new business ventures	x	x	x		x			x			(x)		6
Cannibalisation concerns				x		x					x		3
Little evidence of financial and environmental benefits		x		x	x			x	x		x	x	7
Lack of resources, knowledge, or competencies in-house	x	x	x	x	x	x	x	x	x	x	x	x	12
Uncertainty about legislation in this field		x									x		2
Difficulty establishing cross-organisational collaboration									x	x	x	x	4
Special product design required for maximum profitability			x		x			x	x	x	x		6
Employee level													23
Lack of knowledge about CE and CBMs			x	x		x			x	x	x	x	7
Hesitant approach to promoting the CE agenda							x		x		x	x	4
Prevailing linear business model structures and thinking				x	x	x	x	x	x	x	x	x	9
Incentive structure supporting linear business models									x	x	x		3
	7	11	7	8	13	8	10	11	18	9	20	8	130
Company type	start up	start up	micro	micro	micro	small	small	small	medium	large	large	large	
Customer segment	C	C	B	B	B	C	B	C	B	B	B	B	

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BARRIERS VARY

- different industries
- different starting points
- different capabilities
- different ambition levels
- …so no surprise that the exact barriers experienced vary

RESEARCH SUB-QUESTION:

How can we facilitate circular business model innovation in different company settings?

THREE TYPES OF INNOVATION PROCESS

- Internal
- Hybrid
- Systemic circular business model innovation

- Each type is defined by:
  - A specific *foundation* for the innovation process
  - A set of *characteristics* of the circular business model innovation process
  - The *type of circular business model* that is explored.

APPLICATION OF THE MODEL

- Practitioners can apply the model to guide the circular business model innovation process in a company
- For example:
  1. What is the company's foundation for the innovation process?
  2. What type of process is likely to be most relevant to the company?
  3. What sort of experimentation and stakeholder involvement is most appropriate then?

FOUNDATION

	Internal CBMI	Hybrid CBMI	Systemic CBMI
Point of departure and organisation of CBMI process	Linear company where CBMI is staff driven	Linear company where CBMI is management driven	Circular company where management drives further CBMI
Sustainability strategy	Aims to balance profitable business and environmental improvements. Applies well-established eco-efficiency methods	Aims to be more sustainable than competitors. Challenges own and value chain partners' environmental performance on a continuous basis	Aims to transform the role of business in society and have a net positive impact. Continuously seeks to develop novel solutions in close collaboration with value chain partners

CHARACTERISTICS OF THE PROCESS

	Internal CBMI	Hybrid CBMI	Systemic CBMI
Goal of CBMI experimentation	Clarify company position on circular economy. Preliminary assessment of CBM business potential through the development of easy-to-implement circular services and/or products	Build confidence in CBM business potential by developing circular services and/or products to supplement the existing, predominantly linear business model	Strengthen commitment to circular economy. Refine existing CBM in terms of value proposition, profitability and scalability through development of new or improved circular services and/or products
Type of experimentation	Ad hoc experimentation commenced within a single department. Prefers safe arenas such as internal workshops or collaboration with circular economy knowledge experts from outside the value chain	Structured experimentation process. Exploring attitudes of and collaboration opportunities with existing or new value chain partners	Continuous experimentation. Actively engaging value chain partners upstream and downstream in creation of new solutions
Involvement of internal and external stakeholders	Focuses on internal dialogue. Minimal value chain partner involvement	Focuses on internal collaboration and/or dialogue with trusted or new value chain partners	Engages internal and external stakeholders in the experimentation. Focuses on developing existing collaboration with value chain partners or establishing collaboration with new value chain partners

EXPLORED BUSINESS MODELS

	Internal CBMI	Hybrid CBMI	Systemic CBMI
Explored types of CBM	Internal CBM that incorporates resource efficiency improvements and recycling, for instance in the manufacturing process, thus narrowing and/or closing resource loops. The internal CBM is implemented locally within the company and does not interfere with the core business	Hybrid CBM that incorporates selected circular services and/or product design features. The hybrid CBM complements the existing business model by closing and/or slowing resource loops	Systemic CBM that incorporates improved circular services and product designs into the business model. The systemic CBM aligns all or most business model elements to close and/or slow resource loops in an optimal way

EXAMPLES

BETTER WORLD
FASHION

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Could a model of this kind be relevant to your research?

Is something missing for it to be useful in your work?

	Internal CBMI	Hybrid CBMI	Systemic CBMI
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Guldmann and Huulgaard (2019)

FOCUS ON LEARNING

- Avoid an excessive focus on the starting point and concrete outcomes of the innovation process
- Instead focus on *organisational learning* aspects
- Getting started on the circular business model innovation process can support the company's ongoing sustainability journey

PUBLICATIONS OF POSSIBLE INTEREST

- Guldmann, E., Huulgaard, R.D., 2019. Circular Business Model Innovation for Sustainable Development. In Bocken, N.M.P., Ritala, P., Albareda, L., Verburg, R. (Eds.): Innovation for Sustainability: Business Transformations Towards a Better World, Palgrave MacMillan, Switzerland.
- Guldmann, E., 2018. Circular Business Models: Innovation Journeys Towards a Circular Economy. PhD Dissertation, Aalborg University, Aalborg, Denmark. Available at: www.aau.dk from January 2019.
- Guldmann, E., Remmen, A., 2018. Towards Circular Business Models: Experiences in Eight Danish Companies. Danish Environmental Protection Agency, Copenhagen, Denmark. [pdf] Available at: https://www2.mst.dk/Udgiv/publications/2018/04/978-87-93614-97-0.pdf [Accessed September 6, 2018].
- Guldmann, E., 2016. Best Practice Examples of Circular Business Models. Danish Environmental Protection Agency, Copenhagen, Denmark. [pdf] Available at: https://www2.mst.dk/Udgiv/publications/2016/06/978-87-93435-86-5.pdf. [Accessed September 6, 2018].

THANK YOU!

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SUPPLEMENTARY SLIDES

	OPERATIONAL OPTIMISATION	ORGANISATIONAL TRANSFORMATION	SYSTEMS BUILDING
Innovation objective	Compliance and efficiency	Novel products, services or business models	Novel products, services or business models via new networks
Level of business model innovation	Little, if any	Basic changes, without challenging the core business logic	Radical changes, including a redefinition of the core business logic
Innovation outcome	Less harm to environment	Shared value for multiple stakeholders	Net positive impact on society

Figure from Guldmann (2018). Adapted from Adams et al. (2016) and Schaltegger et al. (2012)

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