



TOWARDS A CIRCULAR ECONOMY

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Bio: Eva Guldmann

- ▶ 2014-2018: Research into how to implement Circular Economy in Danish companies (PhD project, Aalborg University)
- ▶ 2002: MSc in Engineering, in the field of Planning and Management (Technical University of Denmark)
- ▶ 9 years of industry experience from among others LEGO and Bang & Olufsen





Structure of presentation

1. Why Circular Economy is relevant to Europe
2. A definition of Circular Economy
3. How companies can integrate Circular Economy
4. How regulation and monitoring can support a transition to Circular Economy

Questions and discussion



Why Circular Economy is relevant

Fig. 3: Releases of water pollutants and gross value added (GVA) for industry (EEA-33)

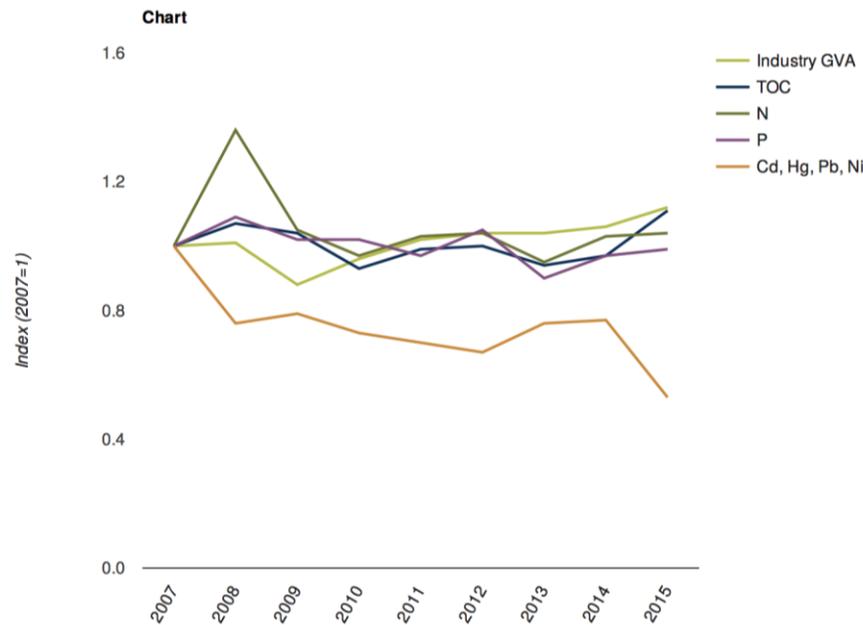
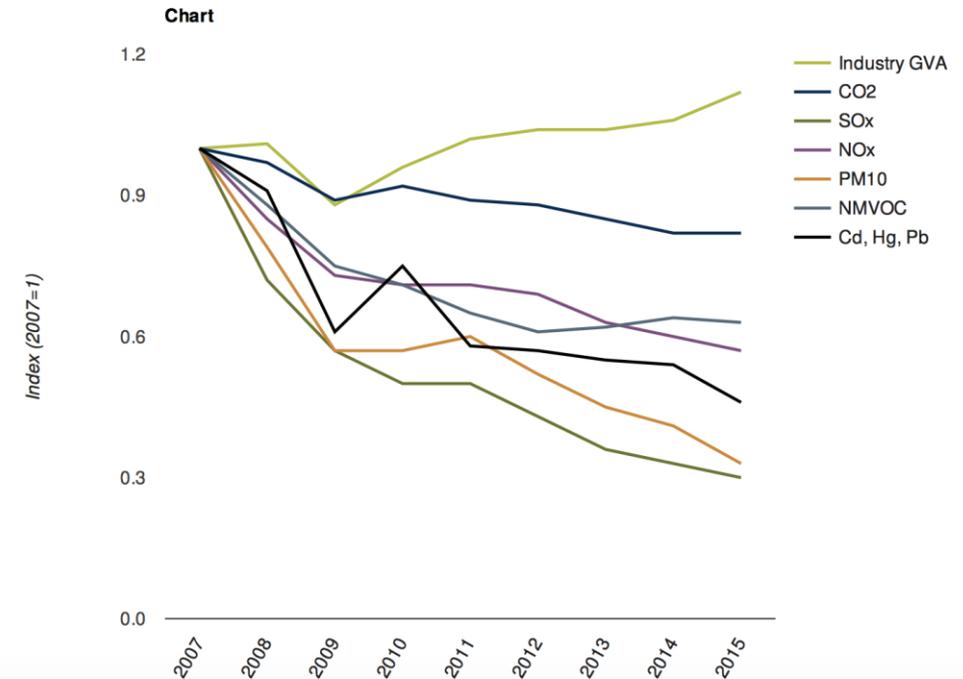


Fig. 1: Releases of air pollutants and gross value added (GVA) for industry (EEA-33)



Why Circular Economy is relevant

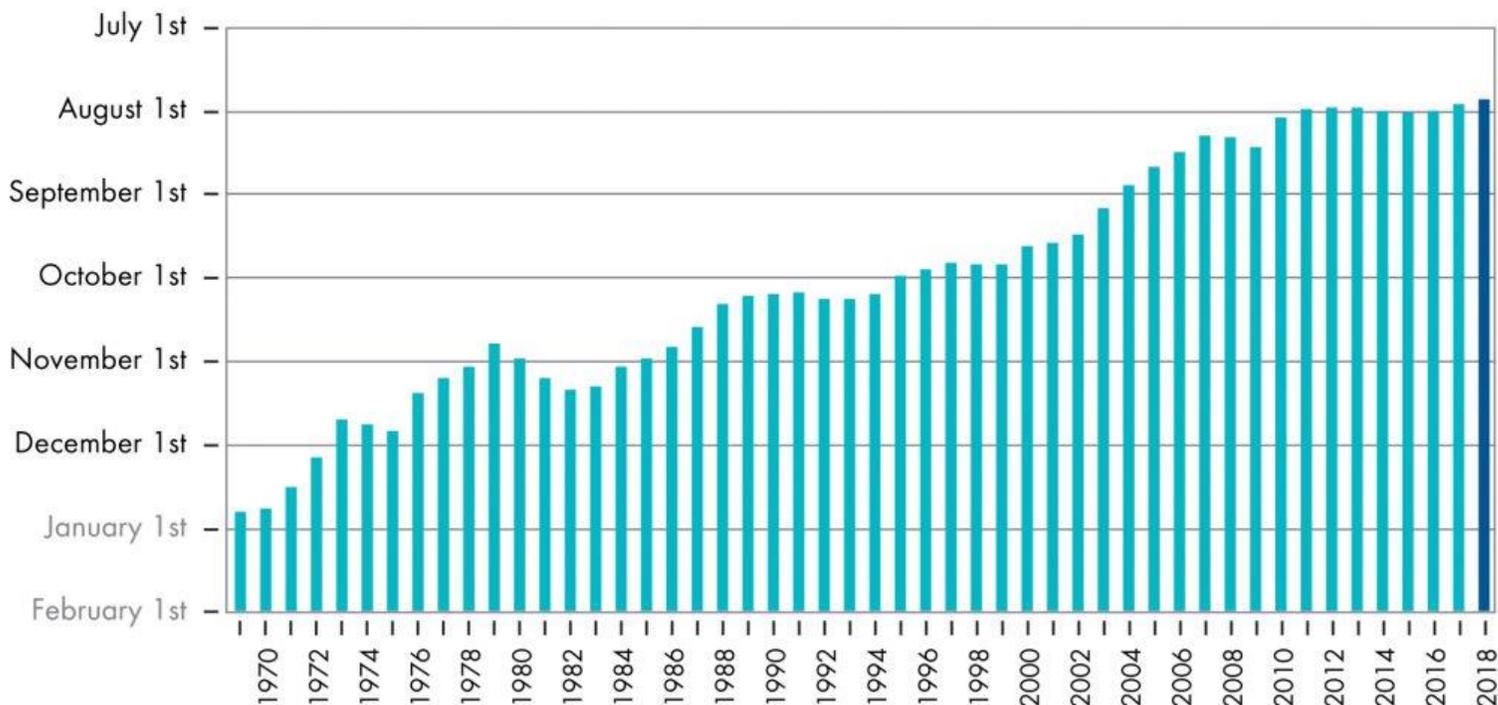


1 Earth

Earth Overshoot Day 1969-2018



1.7 Earths



Source: Global Footprint Network National Footprint Accounts 2018



What is Circular Economy?





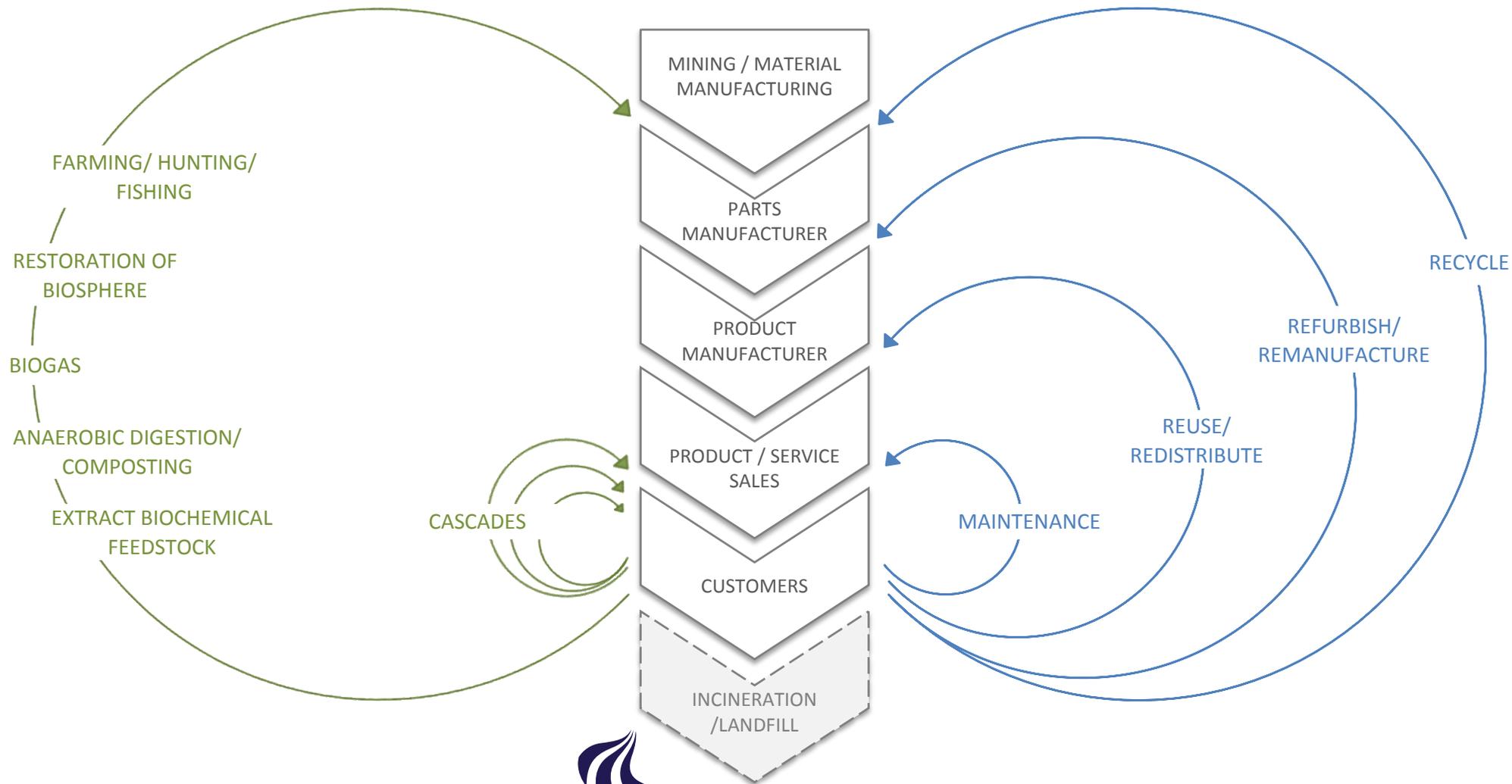
One definition

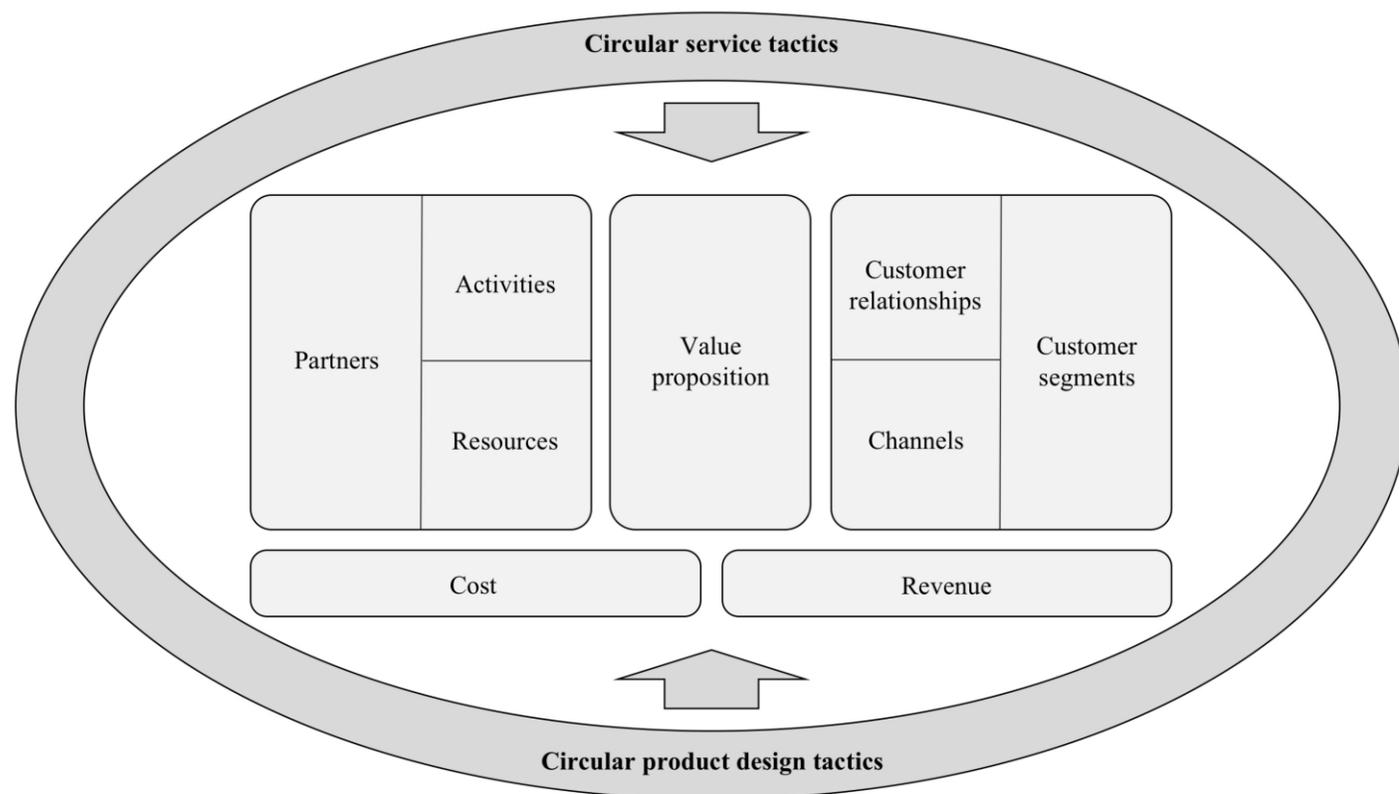
”A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the ‘end-of-life’ concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models.”

(Ellen MacArthur Foundation, 2012, p.7).



Resource loops





5 Redesign principles

- ▶ inner circles
- ▶ circling longer
- ▶ cascading use
- ▶ pure flows
- ▶ renewable inputs



Barriers

Case companies	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	C start up	C start up	B micro	B micro	B micro	C small	B small	C small	B medium	B large	B large	B large	
Customer segment													



Description	Selected references
Lack of concrete, coherent, strict legislation	Rizos et al. (2016)
Taxation of labour rather than raw materials renders labour intensive reuse and recycling activities expensive	Stahel (2010); Kissling et al. (2013)
Legislation hinder CBMs, e.g. legislation on sales of waste materials and on cross-border movement of products for reuse	Singh and Ordoñez (2016); Milovantseva and Fitzpatrick (2015); Mont (2002); King et al. (2006)
Warranty legislation hinders the use of reused spare parts	Riisgaard et al. (2016)
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)
Lack of supportive public procurement policies	Rizos et al. (2016)



Detailing regulatory barriers





Regulation as a motivator

“We could see [Circular Economy] is starting to accelerate. We saw the material that came from the EU last year before Christmas regarding many of these things. It was perhaps also an attempt to have due care and diligence. To avoid getting into difficulties, because we experienced that before for example with respect to the RoHS directive.”

(Sustainability Director, large global company)





“A more circular economy could play a key role in helping Europe and the world meet our climate targets.”

(Enkvist and Klevnäs, 2018)

SUM UP

- **Companies: curious and see potential**
- **Help them circumvent barriers**
- **Regulation: provide the needed carrot and stick**
- **Keep monitoring industrial pollution**
- **Develop new indicators (e.g. level of recycling, refurbishment, reuse and maintenance)**



Publications

- ▶ Guldman, E., 2016. 'Best Practice Examples of Circular Business Models'. Copenhagen, Denmark.
- ▶ Guldman, E., Remmen, A., 2018. 'Towards Circular Business Models: Experiences in Eight Danish Companies'. Danish Environmental Protection Agency, Copenhagen, Denmark.
- ▶ Guldman, E., 2018 (forthcoming). 'Circular Business Models: Innovation Journeys Towards a Circular Economy'. PhD dissertation, Aalborg University.
- ▶ Guldman, E. and Huulgaard, R. D., 2019 (forthcoming). 'Circular Business Model Innovation for Sustainable Development', in Bocken, N. et al. (eds) *Innovation for Sustainability: Business transformations towards a better world*. Palgrave Macmillan, Hampshire, UK.



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Enkvist, P.-A. and Klevnäs, P. (2018) *The Circular Economy – A powerful force for climate mitigation*. Stockholm, Sweden. Available at: materialeconomics.com.

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Questions or comments?



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