Circular Economy and Circular Business Models

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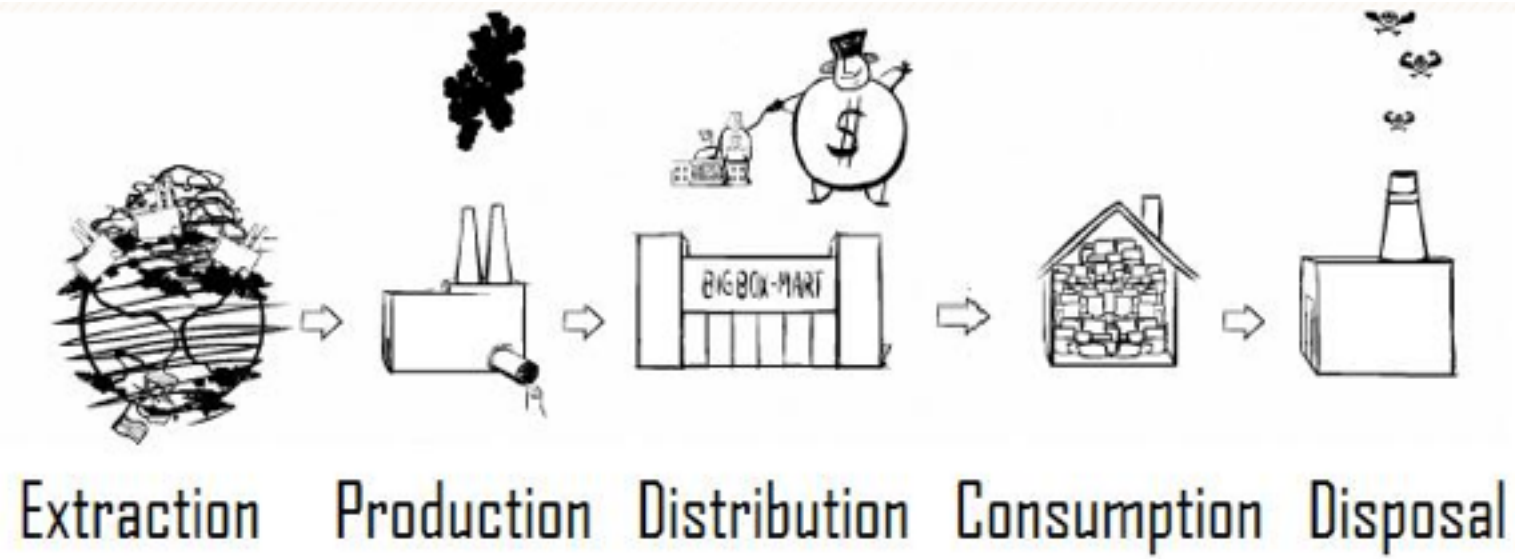
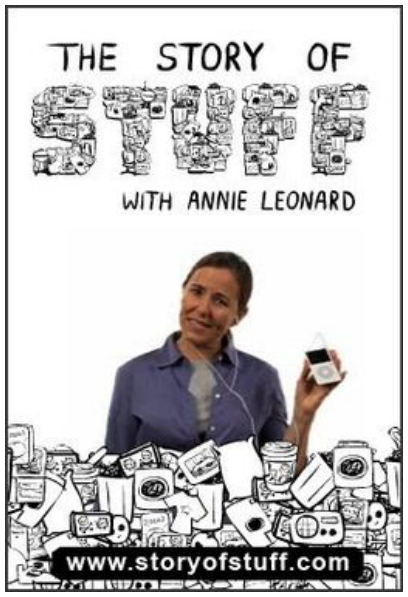
Introduction

Endorsements

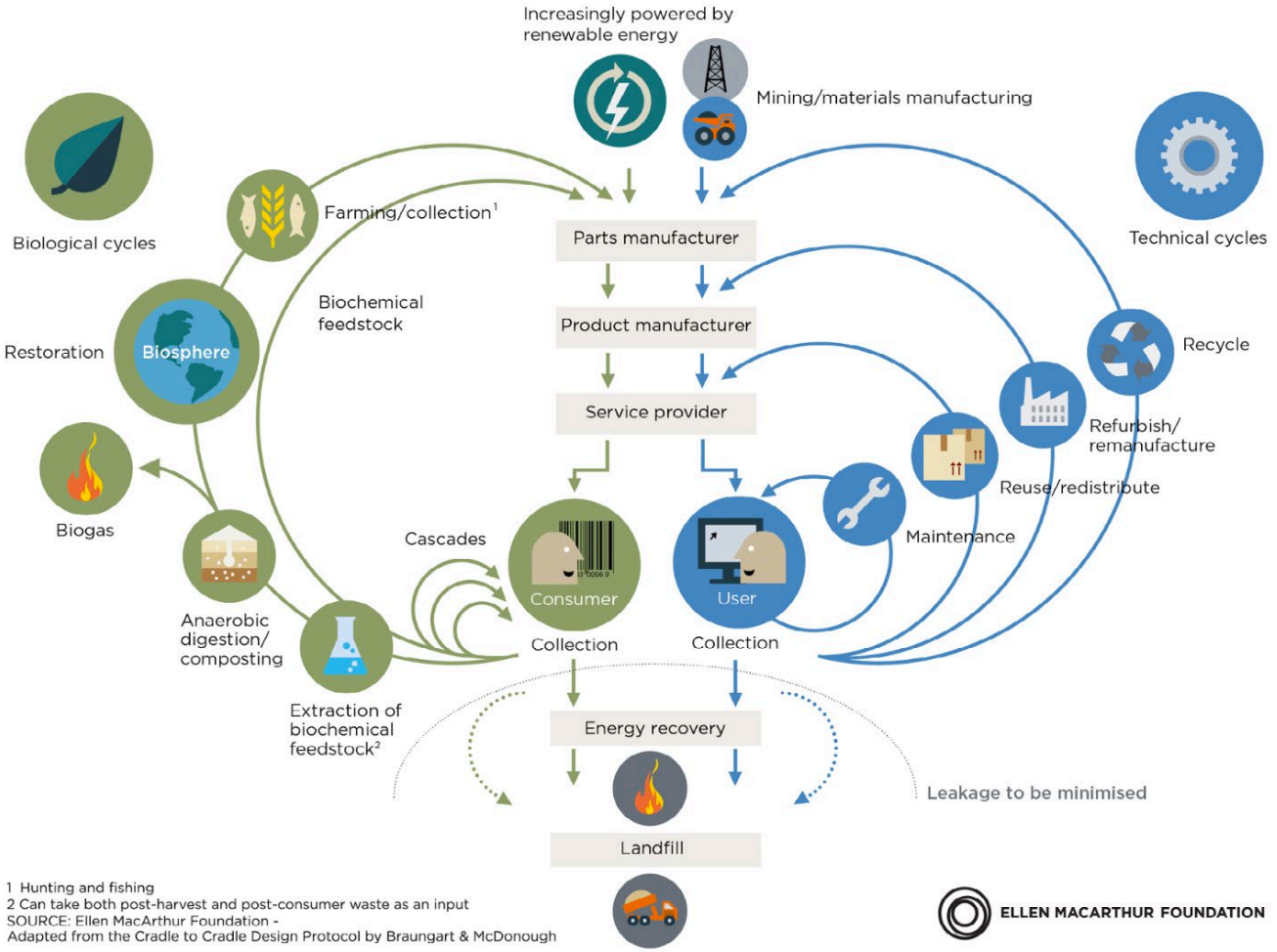
- People's Republic of China
- European Union
- World Commission on Environment and Development
- World Economic Forum
- IKEA, H&M, Renault, Danone, Philips, Google, Unilever, Sun, Nike, Intesa Sao Paolo, …





Against Linearity

“An industrial system that is restorative by design”



- **A concrete and ambitious programme of action, with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials and a revised legislative proposal on waste.**

- **The proposed actions will contribute to "closing the loop" of product lifecycles through greater recycling and re-use, and bring benefits for both the environment and the economy.**

https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0614&from=EN

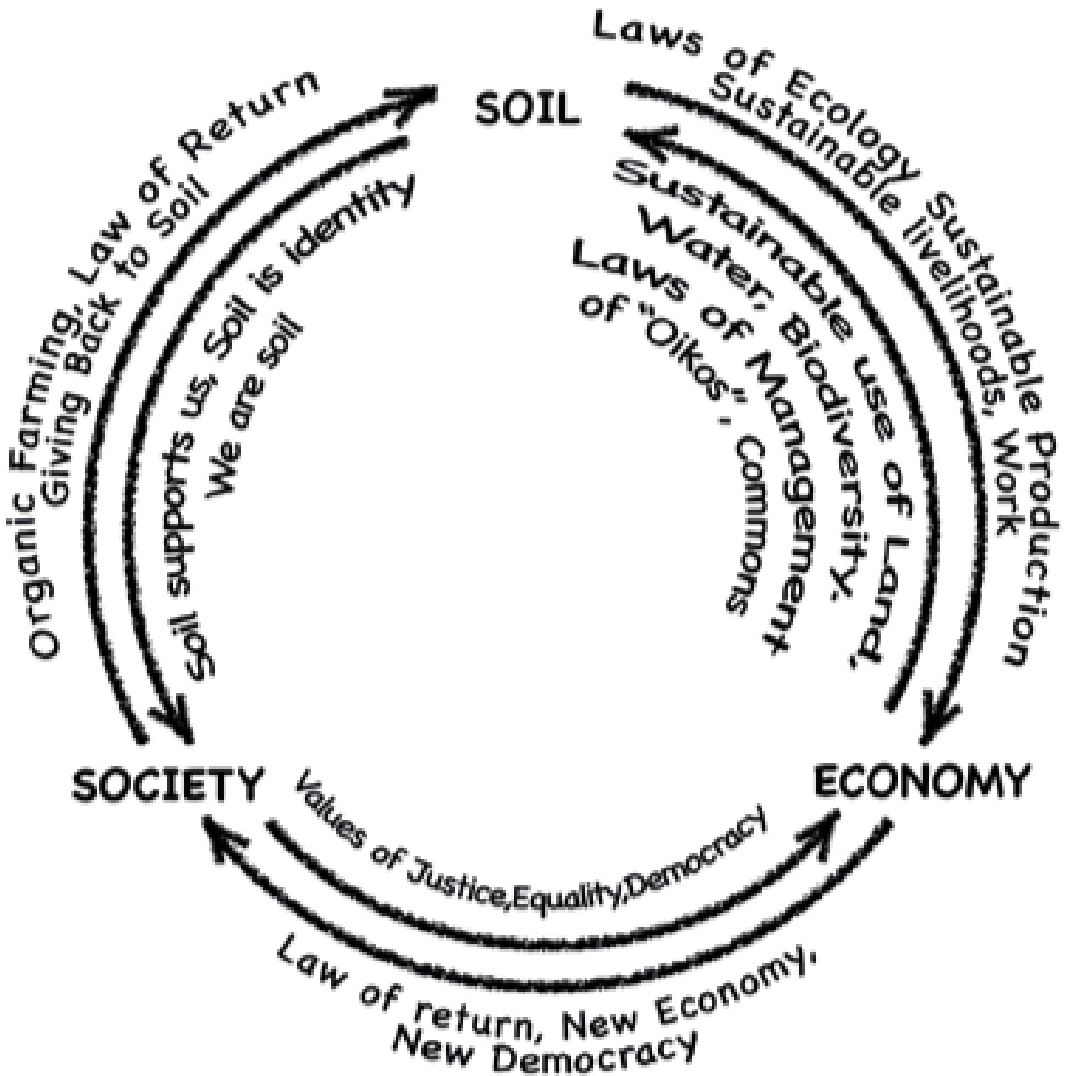
- **The transition to a more circular economy, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized.**
- **The circular economy will boost the EU's competitiveness by protecting businesses against scarcity of resources and volatile prices, helping to create new business opportunities and innovative, more efficient ways of producing and consuming.**
- **It will create local jobs at all skills levels and opportunities for social integration and cohesion.**

- It will save energy and help avoid the irreversible damages caused by using up resources at a rate that exceeds the Earth's capacity to renew them in terms of climate and biodiversity, air, soil and water pollution.
- By stimulating sustainable activity in key sectors and new business opportunities, the plan will help to unlock the growth and jobs potential of the circular economy.
- It includes comprehensive commitments on ecodesign, the development of strategic approaches on plastics and chemicals, a major initiative to fund innovative projects
- It includes targeted action in areas such as plastics, food waste, construction, critical raw materials, industrial and mining waste, consumption and public procurement.

1. Where is the idea of a circular economy coming from?

The circle as metaphor for life

Vandana Shiva (2017)

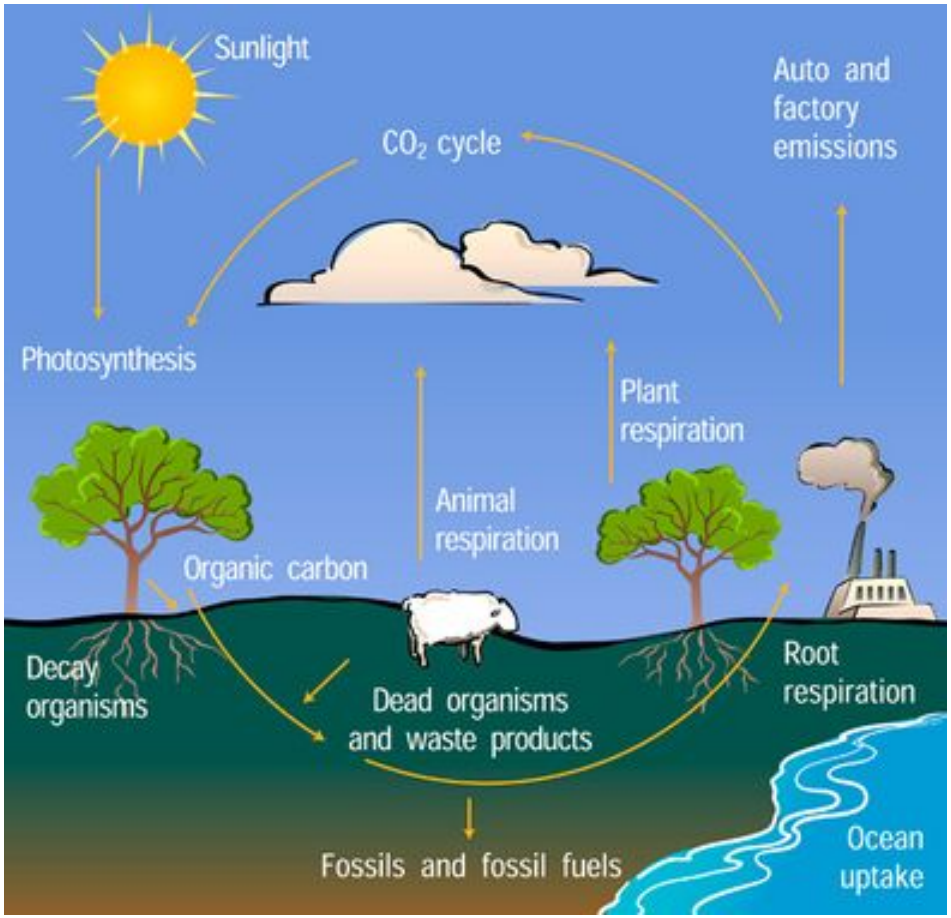


http://www.europarl.europa.eu/cmsdata/115353/Speech%20Vandana%20Shiva_EN.docx

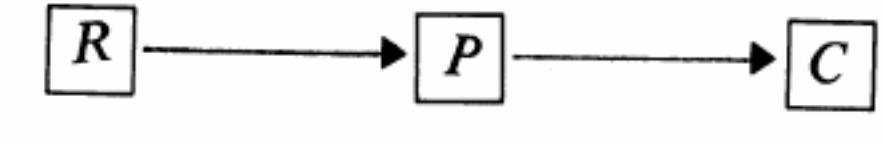
The circular logic of Law of Return, mutuality, reciprocity and regeneration

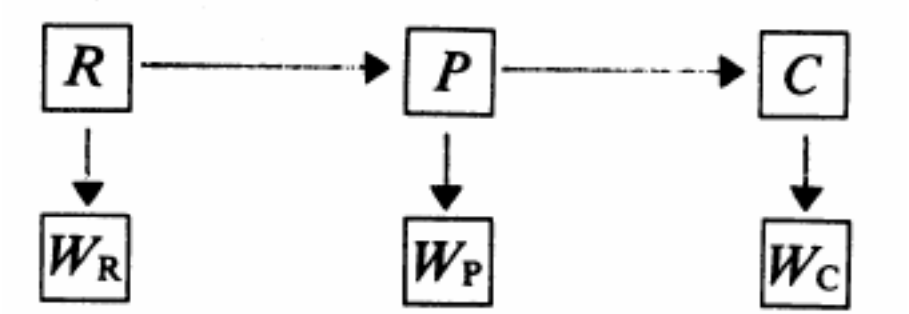
Ecology

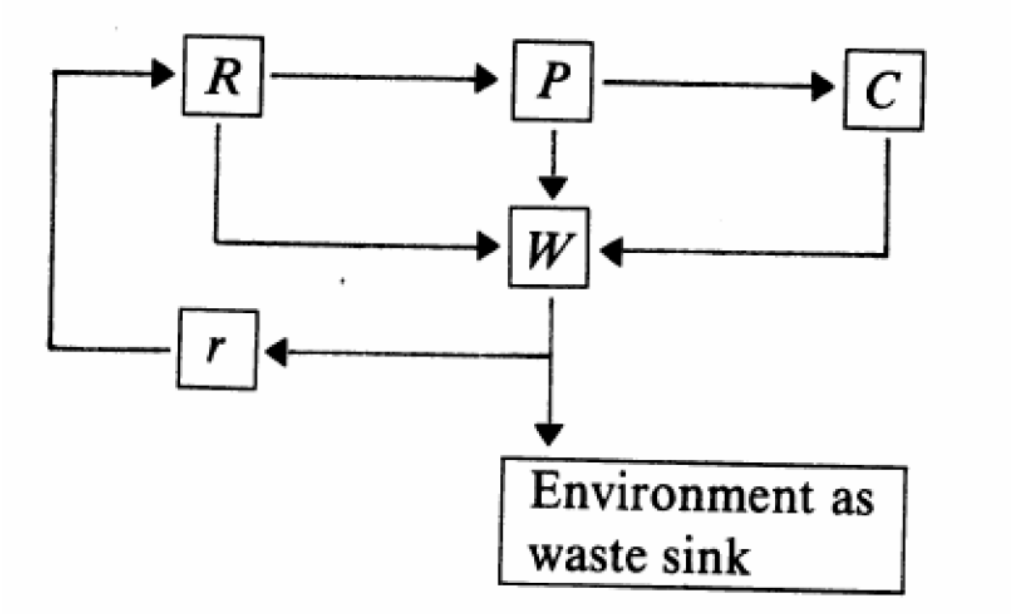
The Carbon Cycle



Environmental economics







Pearce and Turner 1990

R: Resource; P: production; C: consumer goods; W: waste; r: recycling

Varied school of thoughts

(Ellen Mac Arthur Foundation)

- Cradle to Cradle
- Performance economy
- Biomimicry
- Industrial Ecology
- Natural Capitalism
- Blue Economy
- Regenerative Design
- Cascaded uses

https://www.ellenmacarthurfoundation.org/circular-economy/concept/schools-of-thought

Two other good reasons

- **Secure supply**
  - **National safety**
  - **Corporate safety**
- **Control cost of supplies**

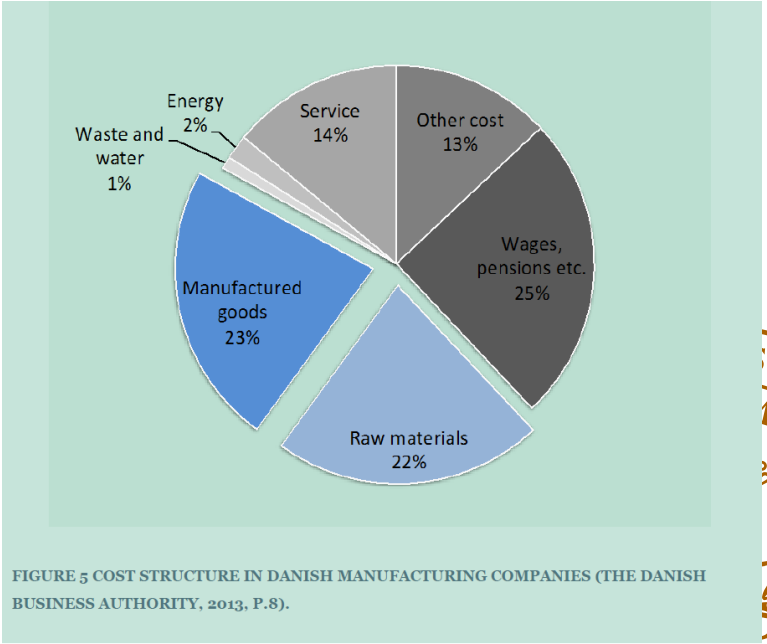
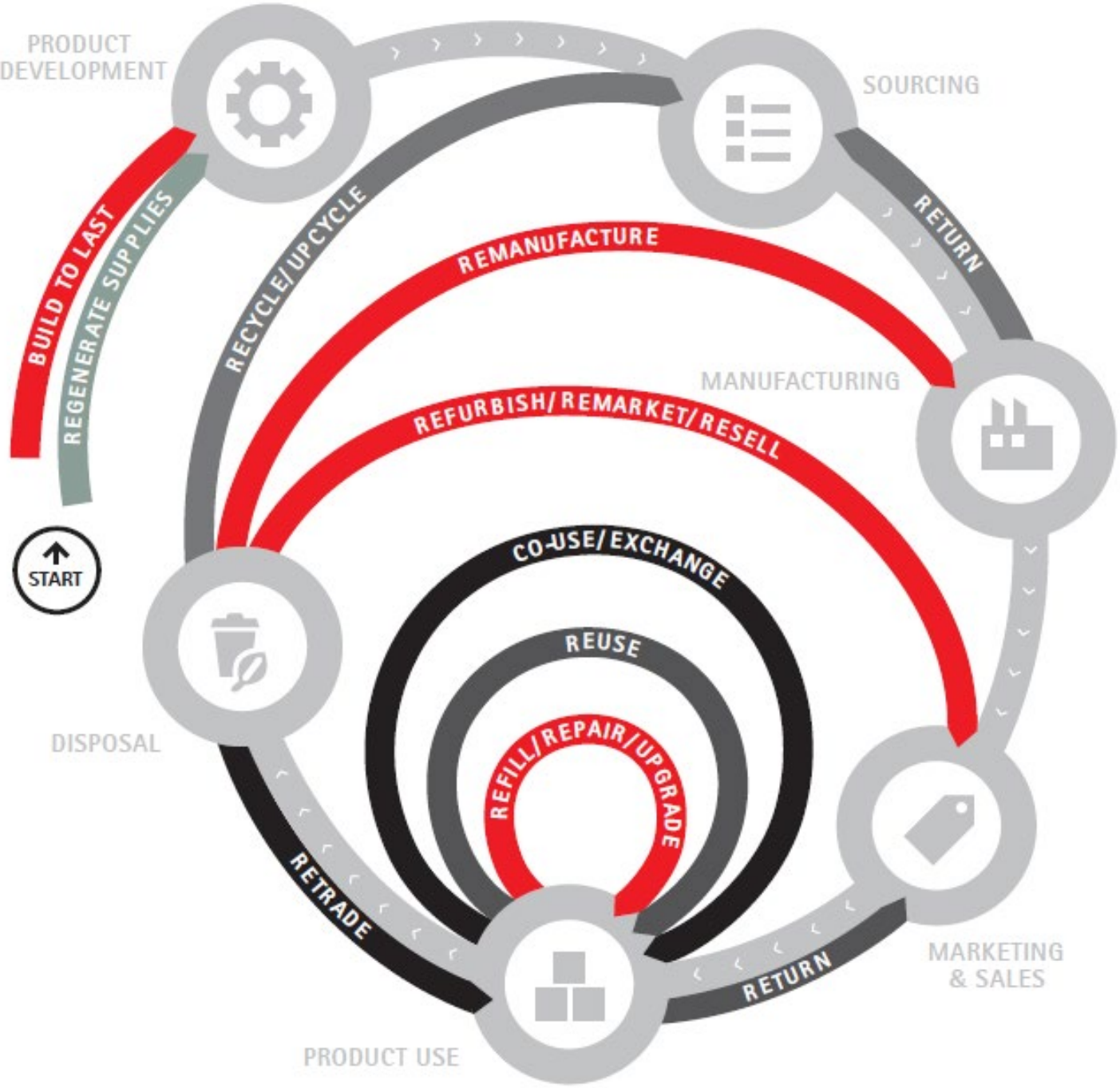


FIGURE 5 COST STRUCTURE IN DANISH MANUFACTURING COMPANIES (THE DANISH BUSINESS AUTHORITY, 2013, P.8).

2. Circular Business Models

Examples of circular economy business models

- Hire & Leasing
- Performance/Service System
- Incentivised Return
- Asset Management
- Collaborative Consumption
- Long Life



Lacy & Rutqvist (2015)

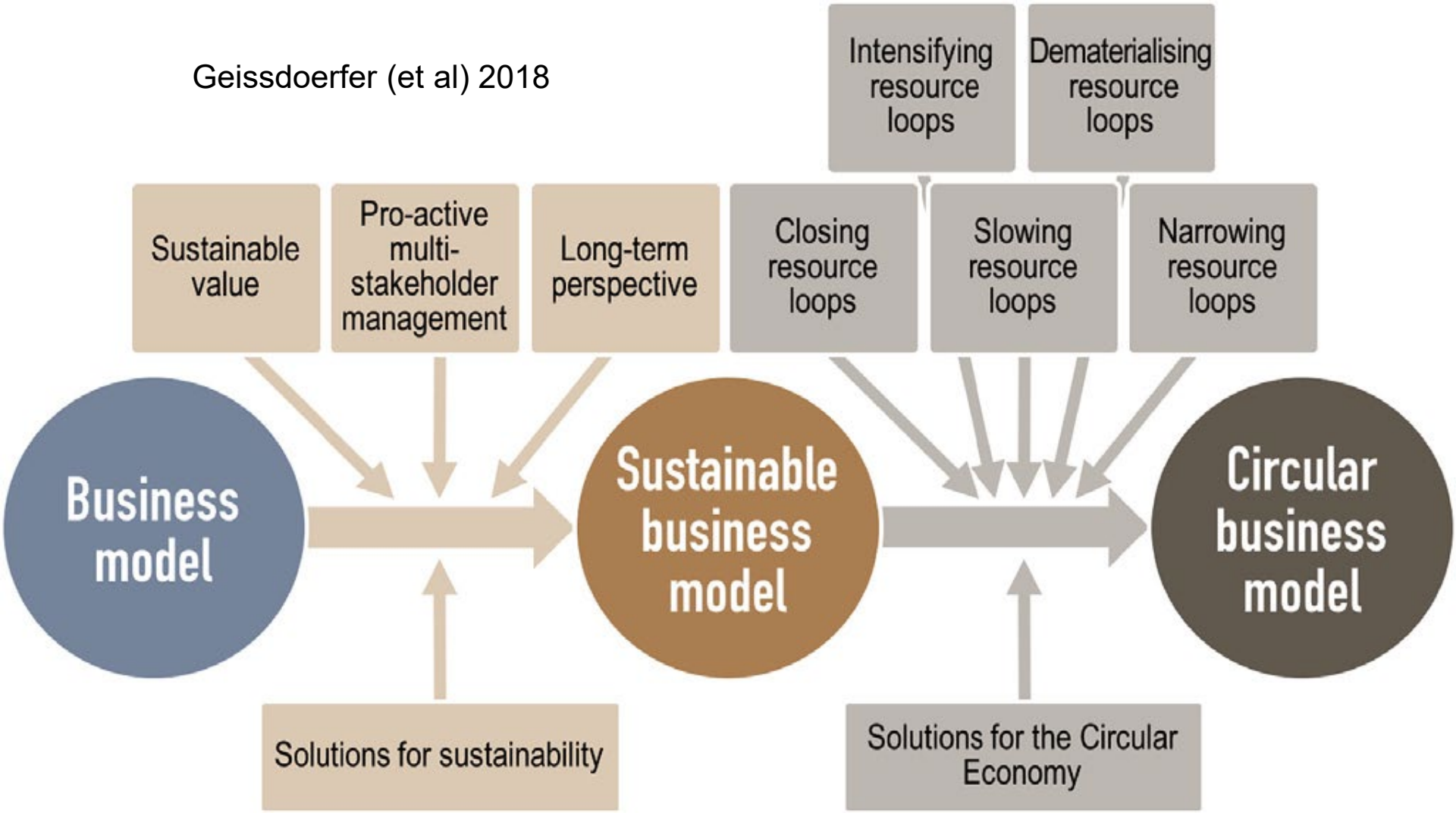
Slowing and *Closing*

- *Slowing* refers to prolonging the use and reuse of goods over time:
  - design of long-life products,
  - product life extension techniques (e.g., repair, and refurbishing
  - pay-per-use or time-based solutions
- *Closing* refers to returning products to production after use:
  - thanks to reverse logistics that take products back from consumers to producers
  - reuse materials through recycling.

Bocken, N. M. P., de Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, *33*(5, SI), 308-320.

Comparison of traditional, sustainable, and circular business models

Geissdoerfer (et al) 2018



Centrality of services

- Repair, refurbish, recycle
- Reverse logistics
- Sharing plattforms, shops, and communities
- Services at the service of extended product lives
- Personal intensive activities
- Dematerialisation/Servification

3. Examples of circular (elements in) business models

CASE STUDY:
NIAGA CARPET

Carpet manufacture has been re-imagined by Niaga. According to Niaga (the word 'again' spelled backwards) adding more and more complex combinations of materials to everyday products will not solve today's product performance, health and environmental challenges. That's why they developed a carpet production technology to make carpets out of one material only, or two materials bound together with an adhesive that can decouple on demand. This allows carpet producing companies to sell or lease carpets that can be 100% recycled to new carpets after use.

The core of the Niaga product design philosophy is to work with a drastically simplified set of known and pure materials. In effect, carpet producers cannot choose the cheapest possible material for different parts, like latex for glue, or bitumen for backing. This additional cost has to come with some financial benefits to make it work in the market place. These benefits present themselves over the full value chain, so they materialise differently in different countries. The product is being trialled in BAM's offices in Bunnik in the Netherlands, where the business case will be evaluated.

"The innovation challenge of full recyclability resulted in a product that also performs better. For everyone in the supply chain it offers something that has the same look and feel but is easier to handle, safer, and future proof."

Lukas Hoex, Niaga

https://www.arup.com/

CASE STUDY: NIAGA CARPET

90 %

Reduction of energy consumption and no use of water compared to traditional carpets

50 %

Reduced time for installation of the carpet, thus generating a significant cost reduction

100 %

Percentage recyclable without losing volume and materials quality

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https://www.arup.com/

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CASE STUDY:
ABN AMRO PAVILION

The Circular Pavilion in Amsterdam creates an accessible entrance to the existing head office of the ABN AMRO bank and contains conference and catering facilities. ABN AMRO developed the building together with BAM, Architects CIE and co-makers and consultants. The circular pavilion of ABN AMRO is engineered with the aim that all 'lights are green' to continue to (re)use the materials in the future. The building is almost completely remountable. A lot of elements consist of virgin material, which have been selected for low environmental impact. There are reused components integrated into the building and interior design, e.g. Inner walls, doors, cables and fire hose reels, and also old jeans, collected from ABN AMRO employees, which have been used to produce acoustic ceilings.

Design and production are no longer considered separately from each other. It is a process in itself to select the best co-creators and partners. This collaborative approach leads to a better utilisation of expertise.

"The value proposition for the ABN pavilion is that we want to experiment with the circular economy how it works in the built environment and learn from the challenges we run into. The real impact is created by sharing these lessons and inspiring our clients to start with the circular economy."

Mark van Rijt, ABN AMRO

https://www.arup.com

ABN AMRO PAVILION

60 %

Good design and collaboration result in up to 60% residual value at end of first life

100 %

Higher ROI for asset owners rather than considering only disposal cost

50 %

BAM's real estate evaluation methodology has evidenced products with >50% residual values after initial use

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Mark van Rijt, ABN AMRO

https://highlights.ikea.com/2017/circular-economy/

INREGO

1. We buy computers mobile phones and other IT products which organisations do not need anymore.
2. We erase all data, we test and upgrade the products and make them ready for a new life.
3. Then we sell and rent the products covered by a warranty to companies, organisations, schools and individuals

https://youtu.be/5dQLP9y7y5s

GIAB®

GODSINLÖSEN NORDIC AB

- **Customer with an insurance claim about mobile phones are asked to send their product to GIAB**
- **GIAB check if the damages to the product correspond to the claim and only then is the insurance payment authorized**
- **GIAB repairs the material and re-sell it in via Blocket, Tradera or its own shop**

http://www.godsinlosen.se/home/om-oss/sahar-fungerar-det-2/ (in Swedish)

4. Unanswered questions

Waste resists

Hazardous


Fluka
Hydrochloric acid
B-1
(B-240)
BENZOL
GIFT
POISON
Natriumhydroxid
NaOH
Strium chloratum pur.
SIEGFRIED — ZOFINGEN

Spread and diverse

INGREDIENTS: HYDROGENATED STARCH HYDROLYSATE, AQUA, HYDRATED SILICA, LAURYL GLUCOSIDE, XANTHAN GUM, MENTHA PIPERITA OIL, SODIUM FLUORIDE, ZINC GLUCONATE, MENTHOL, STEVIA REBAUDIANA EXTRACT, ALOE BARBADENSIS LEAF JUICE POWDER, SALVIA TRILOBA LEAF EXTRACT, CHAMOMILLA RECUTITA FLOWER EXTRACT, COMMIPHORA MYRRHA RESIN EXTRACT, LIMONENE, CI 77891

EN Toothpaste. Only for adults. Contains sodium fluoride (1450 ppm F). **SE** Tandkräm. Endast för vuxna. Innehåller natriumfluorid (0.32% = 1450 ppm F). **NO** Tannkrem. Egner seg kun for voksne. Inneholder natriumfluorid (1450 ppm F). **FI** Hammastahna. Soveltuu vain aikuisille. Sisältää natriumfluoridia (1450 ppm F). **DK** Tandpasta. Kun til voksne. Indeholder natriumfluorid. (1450 ppm Fluorid). **NL** Tandpasta. Alleen voor gebruik door volwassenen. Bevat natriumfluoride (1450 ppm F). **DE** Zahncreme. Nur für Erwachsene geeignet. Enthält Natriumfluorid (1450 ppm Fluorid). **TR** Diş macunu. Sadece yetişkinler içindir. Sodyum florür içerir (1450 ppm F). **FR** Dentifrice. Produit réservé aux adultes. Contient: Sodium fluoride (1450 ppm F). **ES** Pasta de dientes. Apto solo para adultos. Contiene sodium fluoride (1450 ppm F). **IT** Dentifricio. Indicato soltanto per adulti. Contiene fluoruro di sodio (1450 ppm F). **EE** Hambapasta. Ainult täiskasvanutele. Sisaldab naatriumfluoriidi (1450 ppm F).

Composed of several materials

Old and worn out

Energy

Time

Space

Circularity is a bet on the future

Yet, how many laps are we speaking of?

Producers' power
New roles for consumers
Protection of consumers

New social norms

5. Criticisms

Criticism 1/4

- Many different definitions, often developed based on local solutions that have been renamed circular
- Many sources of inspiration which moves at different levels, has different starting points, and different goals
- Vague concept: umbrella concept, empty signifier, floating signifier,

Criticisms 2/4

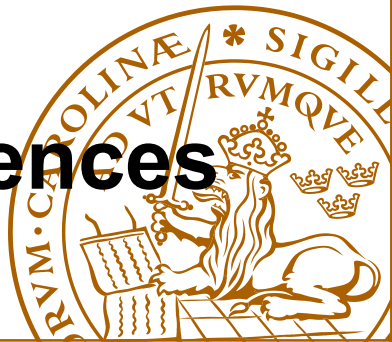
- The circular economy as a global / regional economic system - but how should economic inequalities within these systems be handled?
- Unclear geographical scales: global or micro?
- Unclear time scales: how fast should circles be?

Criticisms 3/4

- **Circular business models - but how should they add to a circular economy?**
- **Circular products - but should companies continue to produce linear products as well?**
- **Circular parts - but what will be the global environmental consequences?**

Criticisms 4/4

- Circular democracy or circular dictatorship: how should circularity come about?
- How should circularity be measured?
- How should consumers be attracted to switch from today's linear to tomorrow's circular solutions?
- What will be the social consequences - gig jobs for everyone?



Unanswered questions

- For the environment ?
- For growth ?
- For national security ?
- For the consumer?
- For more ethics?
- For minor inequalities in the world?

6. Why such a political success?

The circle metaphor

- Something that is closed
- The symbol of perfection
- Metaphysics of totality
- Eternal return
- Mystical protection

A Reformist Model with a Radical Rethoric

- A promise of endless material growth and welfare within environmental boundaries
- An ideological defense of material-energy-and-waste intensive business models
- A model that suits corporate interests and competence
- A model for security of supply

Kind of a “positive” alternative to sustainability

An incantation?

A magic expression that draws on the mystical signification of the circle to protect material welfare and the environment, but also material-and-energy-intensive business models and political promise of endless growth.

But that ignores the material rationales of time, space, and energy. And is not easy to combine with the economic logics of competition and consumption.

Thank you for your kind attention

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Appendix: Four theses on the circular economy

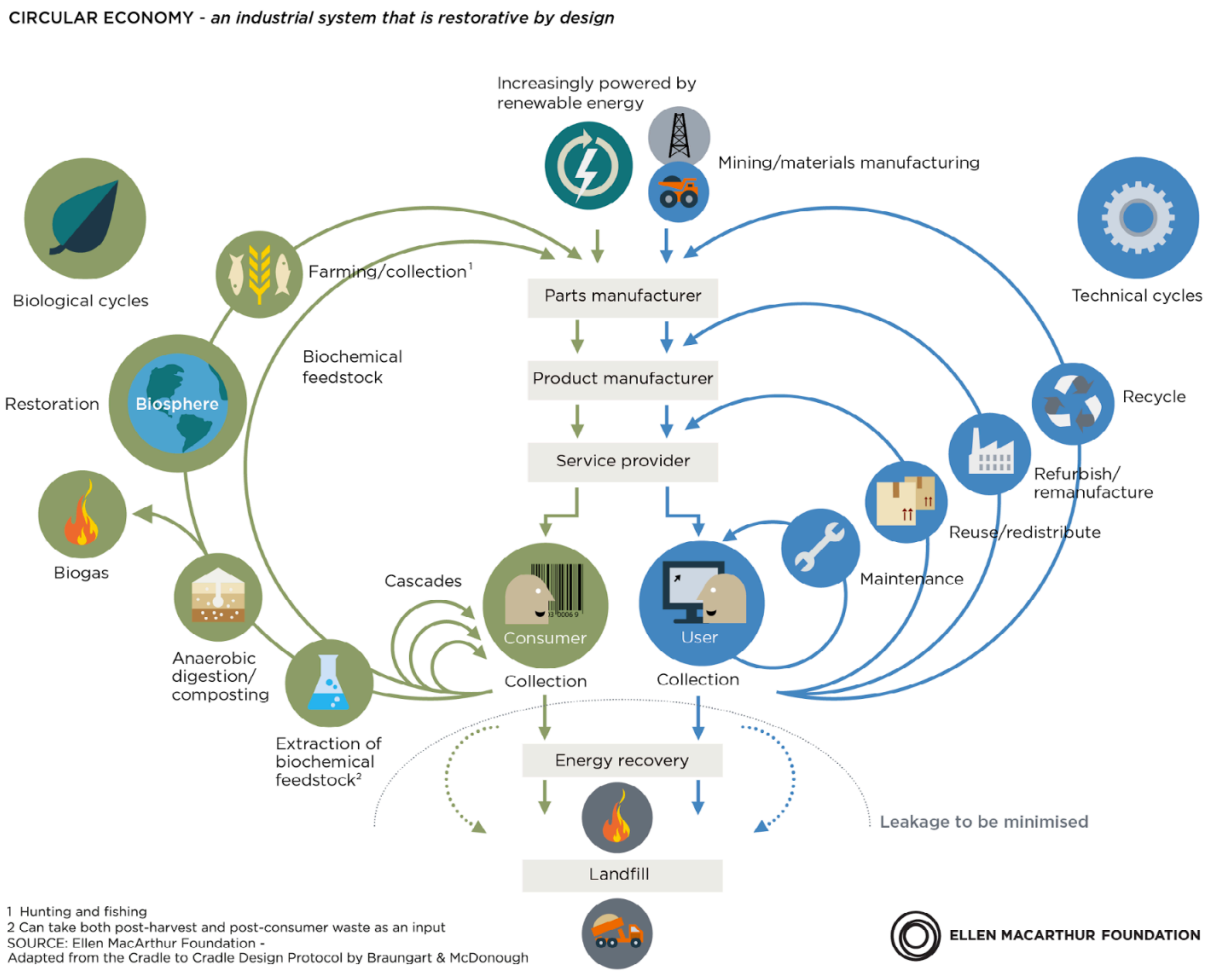
Thesis #1:

The circular economy is a model for material flows.

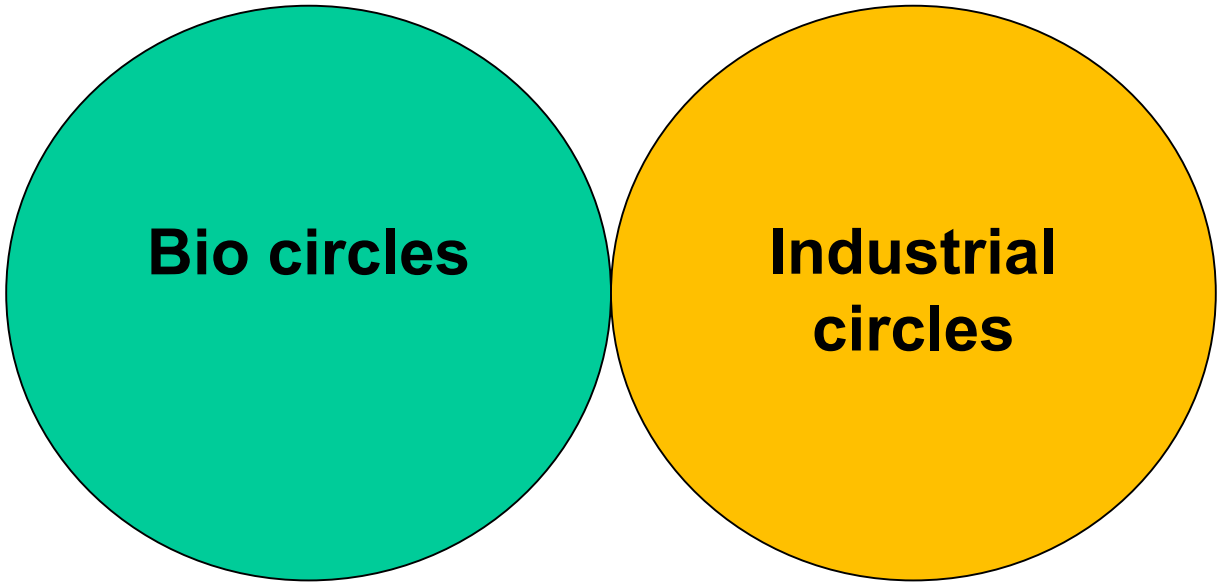
Not a model for economic flows.

Perfect material flows.

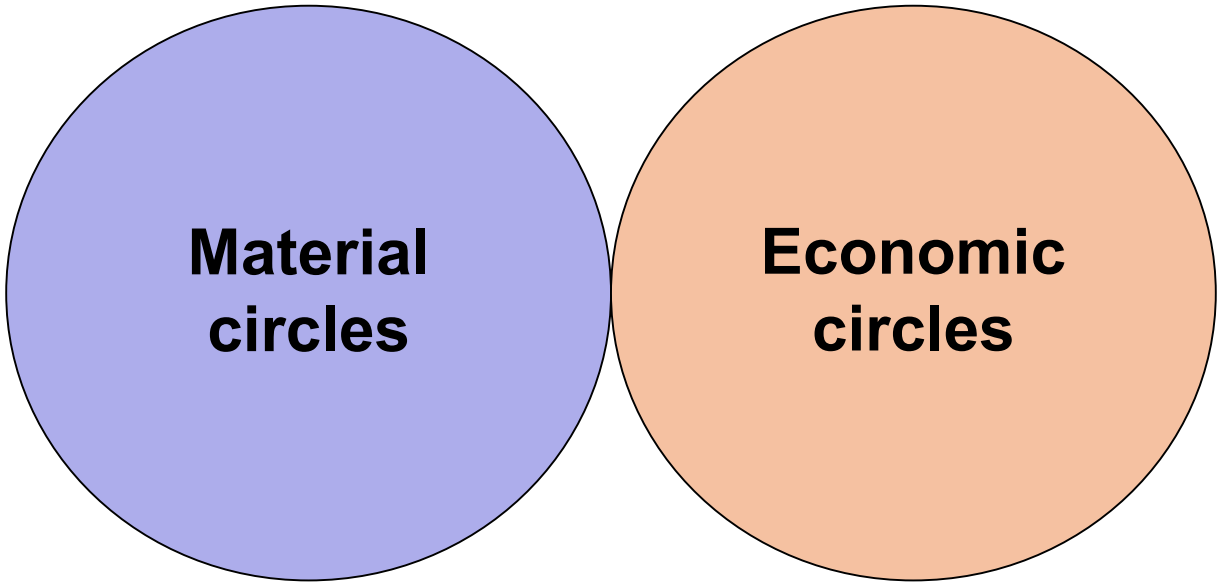
Revisiting the “butterfly diagram”



Bio / Industrial



Circular + Economy



Thesis #2:

As model for material flows, the circular economy needs to encompass the energy, time, and space dimensions of material flows.

Energy

Time

Space

Thesis #3:

As model for material flows, the circular economy needs to / will transform social norms and relationships.

New social norms

Thesis #4:

Linear solutions will not disappear by themselves. To suceed, the circular economy needs that the competitive advantage of linear solutions is systematically limited.

国家电网公司
STATE GRID
CORPORATION OF CHINA

C100 M5 Y50 K40
PANTONE 3292C

3% C100 M5 Y50 K40 PANTONE 3292C 100%

Source: https://www.vanndigit.com/top-10-worlds-largest-companies/