Sustainability, circular economy and legumes:

Economic and financial aspects of change

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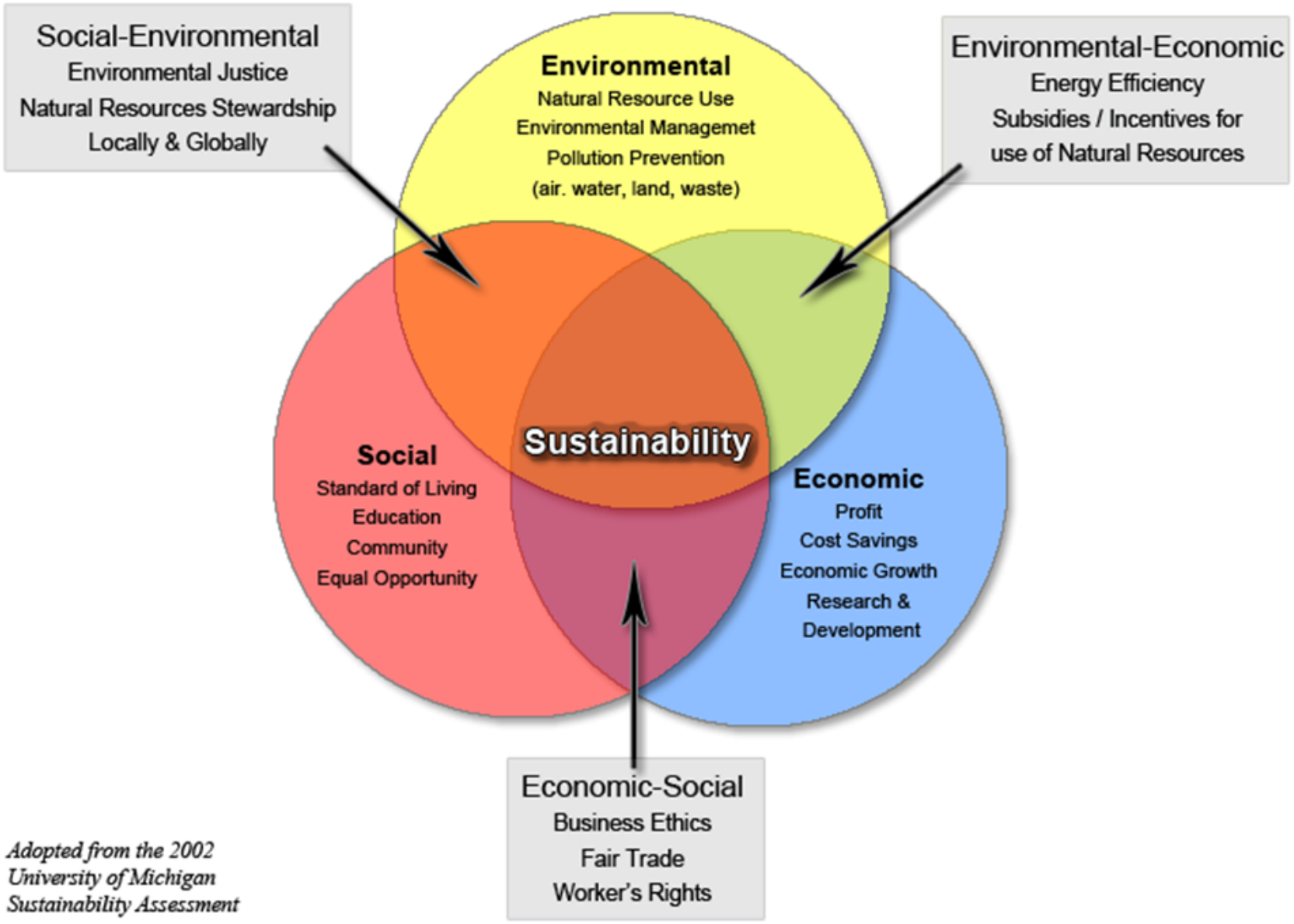
PARTNERS IN CHANGE

Three spheres of sustainability



Adopted from the 2002 University of Michigan Sustainability Assessment

UN Sustainable Development Goals

On September 25th 2015, countries adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda. Each goal has specific targets to be achieved over the next 15 years.

http://www.un.org/sustainabledevelopment/sustainable-development-goals/

An ideal case: Coco Pallets

Discussion questions

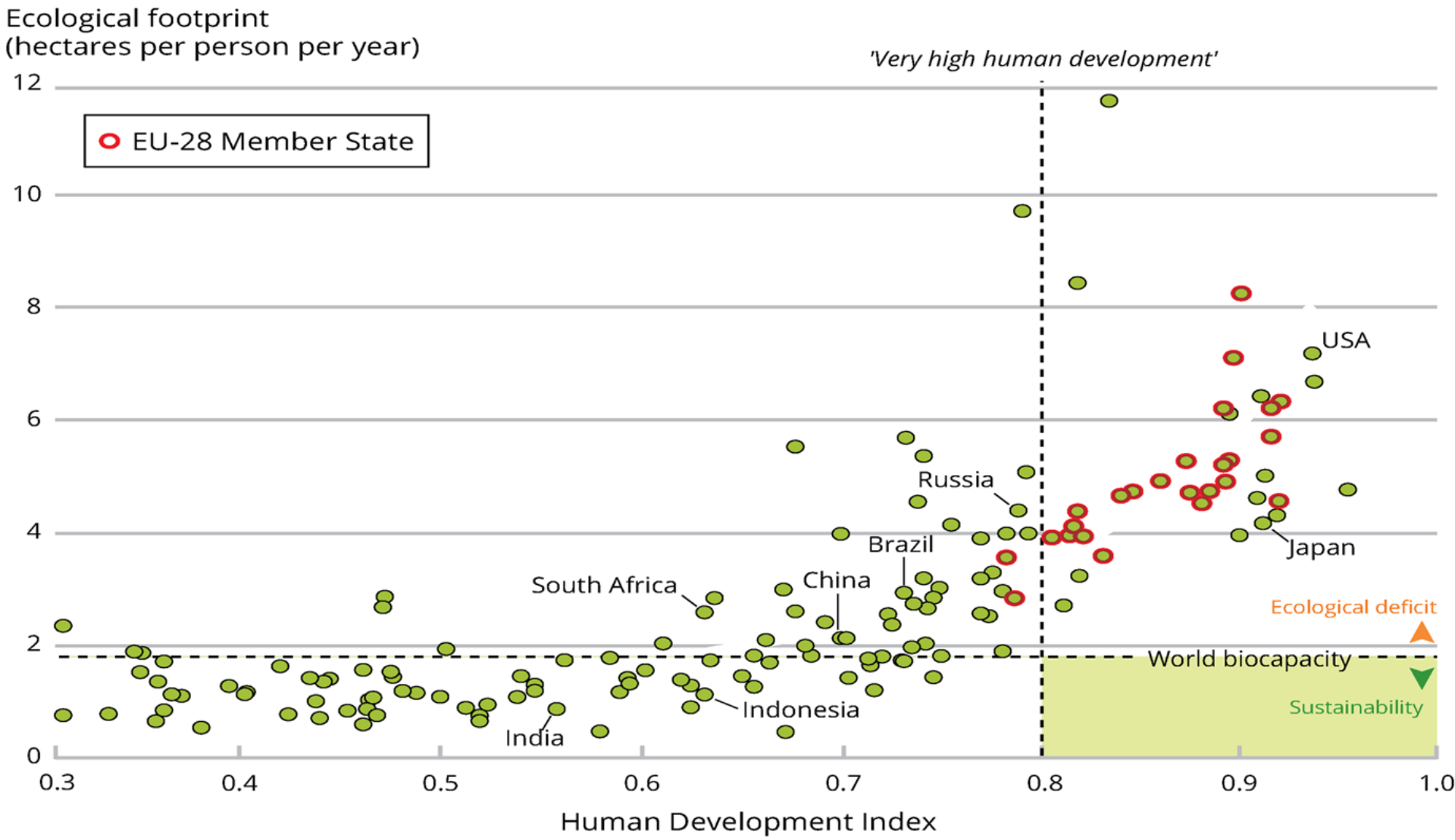
- What‘s the business model?
- Does it make a positive impact on the natural environment?
- What anbout its social component?
- So, why it is sustainable?
- Is this business model innovative?
- is it scalable?
- Is it circular? Why?

Watch:

https://www.youtube.com/watch?v=PfUpyzw4AwU

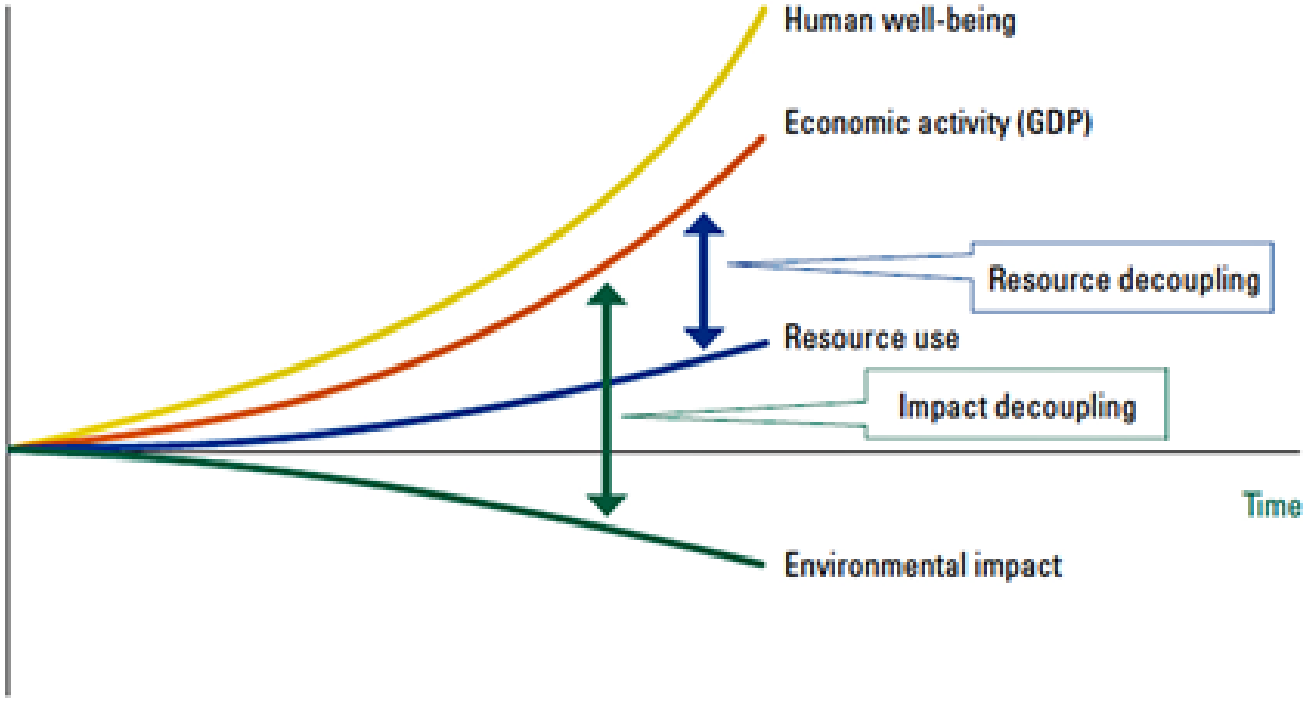
https://www.youtube.com/watch?v=qjIcVHkx_48

Humanity outside the area of sustainable development



Source: Global Footprint Network, 2012; UNDP, 2014

Two aspects of decoupling



Source: Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, UNEP International Resource Panel Report, 2011

Decoupling

The ability of an economy to grow without a proportional increase in the use of primary materials and energy.

An economy that is able to sustain GDP growth without having a negative impact on environmental conditions, is said to be decoupled.

AWARENESS AND MEASUREMENT OF SUSTAINABILITY MAY NOT BE ENOUGH TO ACCELERATE CHANGE.

Sustainability vs circularity: moral duty vs innovation?

Sustainable development (WCED, 1987):
"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Elkington (1999): Triple P (planet, people, profit):
"Finding a balance between economic prosperity, environmental quality, and the element which business has tended to overlook social justice, moves organisations in an absolute state of sustainability."

Coomer (1979):
"The sustainable society is one that lives with in the self-perpetuating limits of its environment."

Looking beyond the current "take, make and dispose" extractive industrial model, **the circular economy** is restorative and regenerative by design. Relying on system-wide innovation, it aims to redefine products and services **to design waste out**, while minimising negative impacts.

Underpinned by a transition to renewable energy sources, the circular model builds economic, natural and social capital.

Ellen MacArthur Foundation

Source: https://www.ellenmacarthurfoundation.org/circular-economy

What does it really mean - the circular economy?

Circular economy: an enonomy in which **stakeholders collaborate** in order to maximise the value of products and materials, and as such contribute to minimising the depletion of natural resources and create positive societal and environmental impact.

Christiaan Kraalijanhagen, Cecile van Oppen, Nancy Bocken: Circular Business, Collaborate and Circulate
Circular Collaboration, The Netherlands, 2016

„The transition to circular economy is not a choice. It is a must.“

Janez Potočnik EC Commissioner for Environment, 2010-14

A paradigm shift

Going circular means proactively adapting to completely new circumstances that are arising out of a systemic transition of the global economy and the global society at the same time.

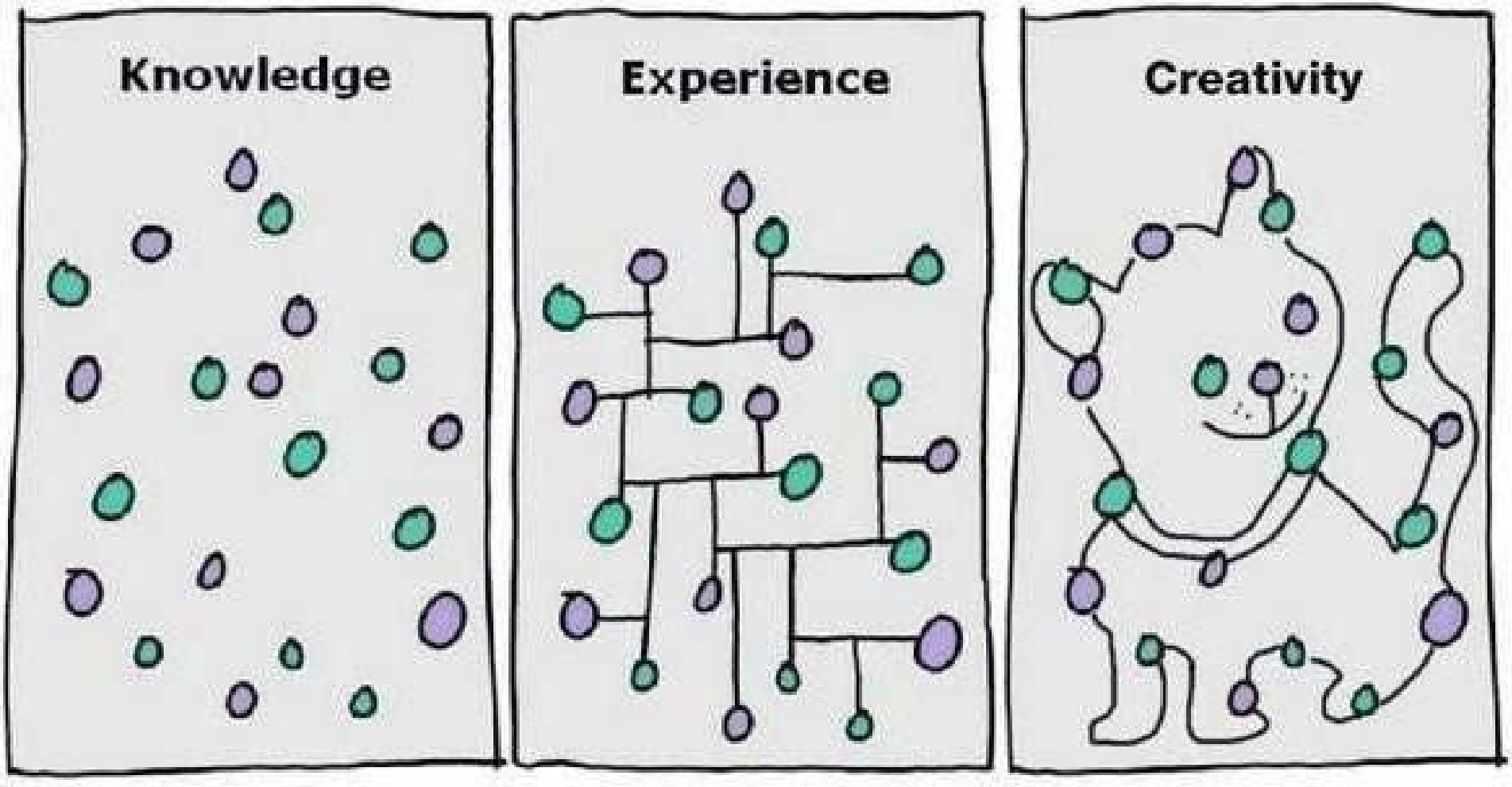
Key assumptions change:

- from bounded rationality to trans-generational rationality;

- from **competition to collaboration;**

- from profitability as the ultimate goal to resource utilisation efficiency;

- from democracy and human rights to the rights of the planet.



INNOVATION FOR SUSTAINABILITY: GOING CIRCULAR

Some constructive criticism on the economics of climate change innovation: Bjørn Lomborg

„Green innovation can solve the climate challenge, not subsidising greener consumption.“

https://www.youtube.com/watch?v=SEjNVWV5jbs

Bjørn Lomborg

is a Danish author and President of his think tank, Copenhagen Consensus Center. He is former director of the Danish government's Environmental Assessment Institute (EAI) in Copenhagen. He became internationally known for his best-selling and controversial book, The Skeptical Environmentalist (2001), in which he argues that many of the costly measures and actions adopted by scientists and policy makers to meet the challenges of global warming will ultimately have minimal impact on the world's rising temperature.

In 2002, Lomborg and the Environmental Assessment Institute founded the Copenhagen Consensus, a project-based conference where prominent economists sought to establish priorities for advancing global welfare using methods based on the theory of welfare economics.

In 2009, Business Insider cited Lomborg as one of "The 10 Most-Respected Global Warming Skeptics". While Lomborg campaigned against the Kyoto Protocol and other measures to cut carbon emissions in the short-term, he argued for adaptation to short-term temperature rises, and for spending money on research and development for longer-term environmental solutions. His issue is not with the reality of climate change, but rather with the economic and political approaches being taken (or not taken) to meet the challenges of that climate change. He is a strong advocate for focusing attention and resources on what he perceives as far more pressing world problems, such as AIDS, malaria and malnutrition. In his critique of the 2012 United Nations Conference on Environment and Development, Lomborg stated: "Global warming is by no means our main environmental threat." In 2011, and 2012, Lomborg was named a Top 100 Global Thinker by Foreign Policy "for looking more right than ever on the politics of climate change".

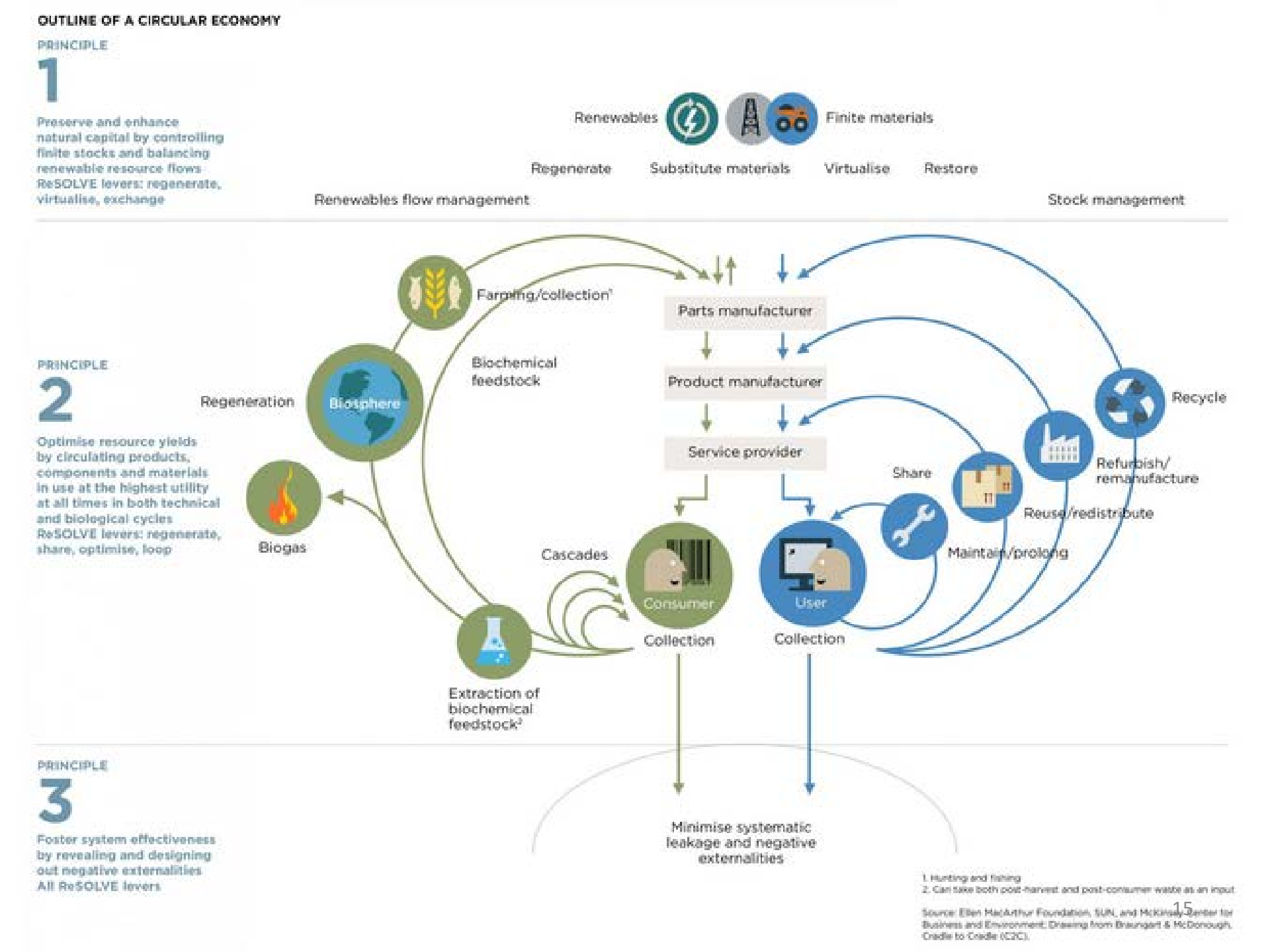
WHY IS IT SO HARD TO TRANSIT TO CIRCULAR BUSINESS MODELS?

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange



PRINCIPLE

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop

PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

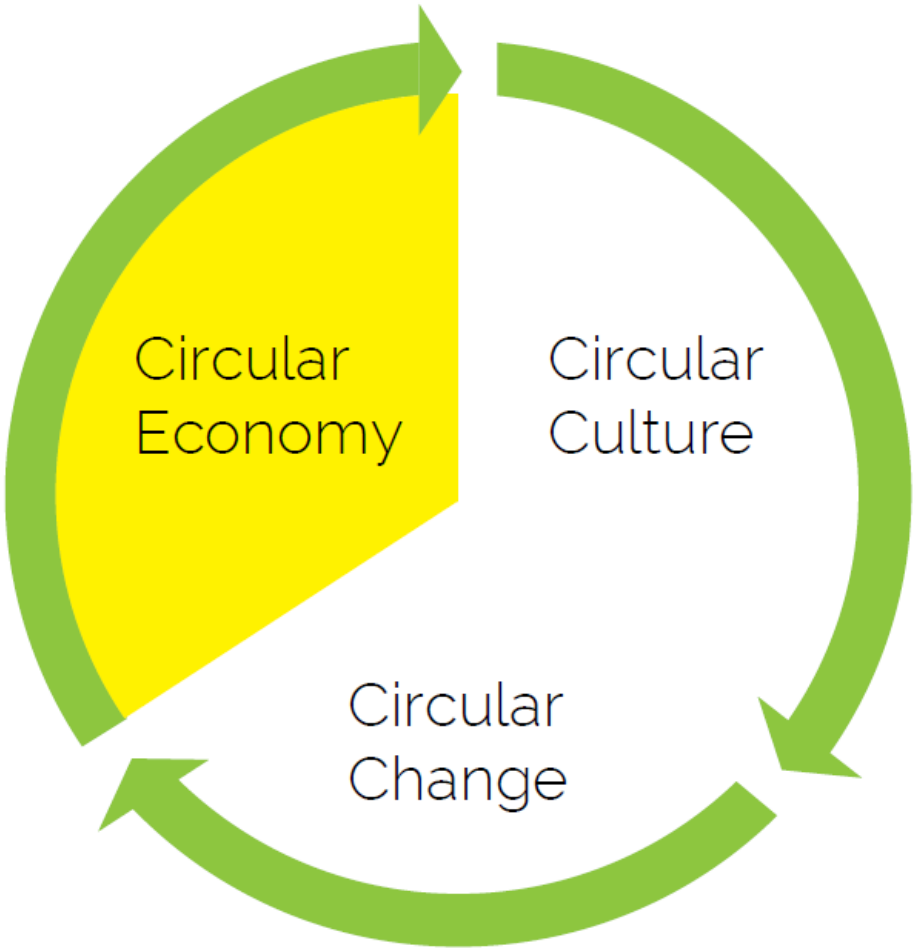
1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input

Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

The Circular Triangle

A multi-layer systemic transition:

A journey through technological discontinuities, emerging regulatory issues, shift in fiscal (taxation), supply-side policies, targeted public investments and other incentives



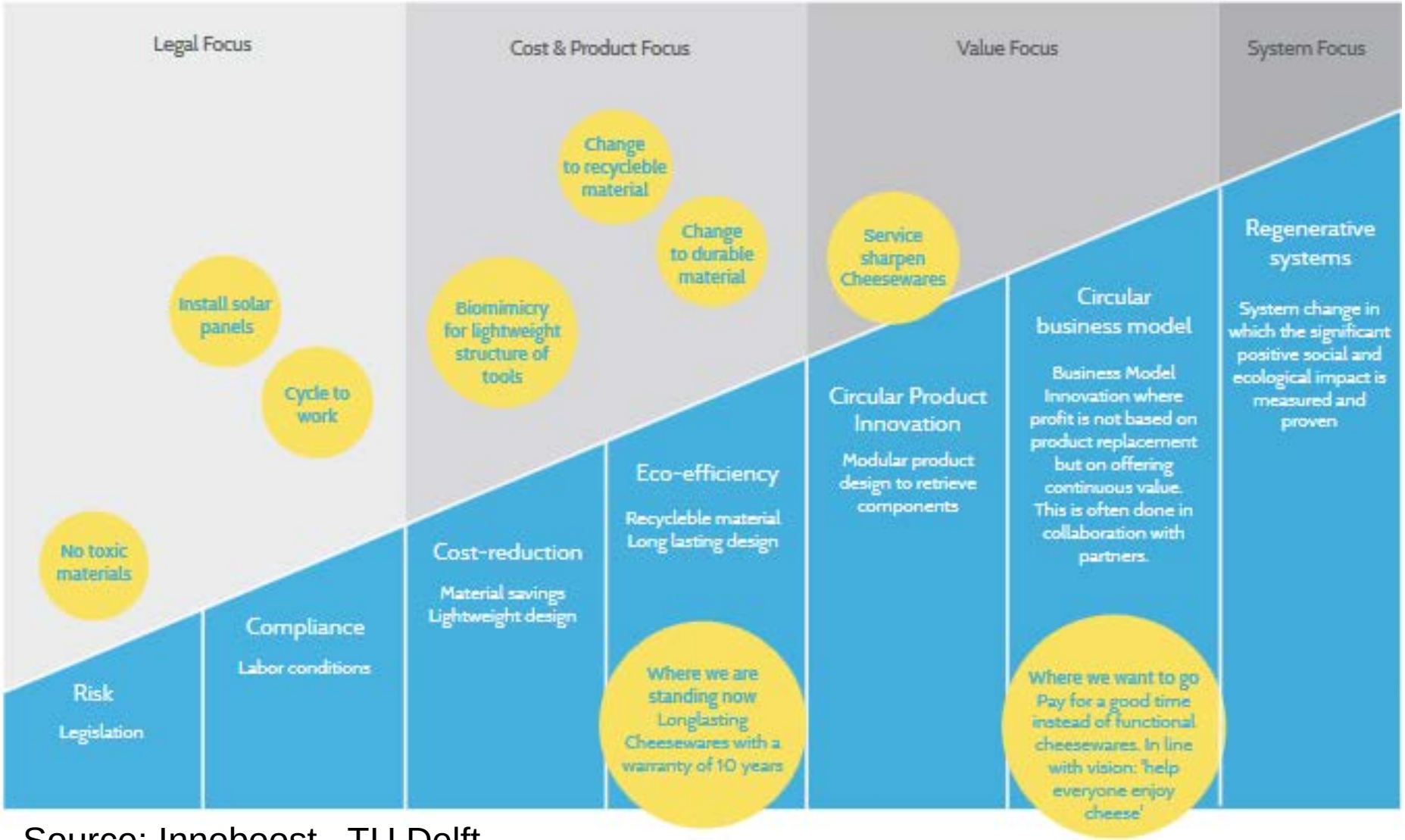
Values and societal dynamics:

Stakeholder relationships; citize actions, aggregate consumer preferencies; industry relations and the future of work

Corporate transformation:

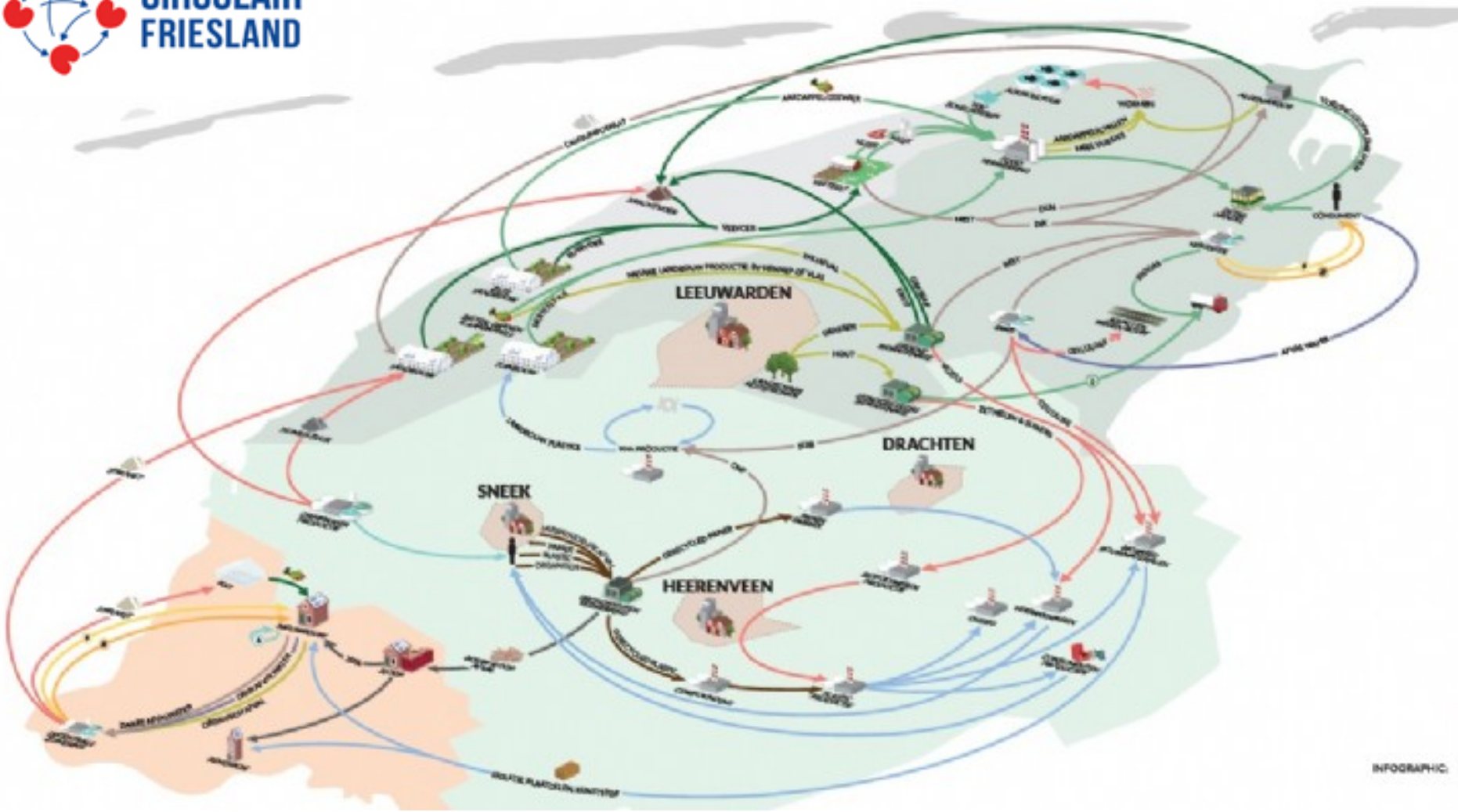
A circular business model (re)design; cross-industry value chains and cooperation; innovation management; acqusition of new competencies

Risk to opportunity map: developing a circular business model



Source: Innoboost, TU Delft

CIRCULAIR FRIESLAND



Friesland is already anticipating on a circular economy. Energy neutral houses are being built, delicious products are being grown on saline soil, and household appliances are being made from recycled plastic. It is important to work on this together, because in a circular economy loops are closed, and a wide range of sectors will use each other's resources, knowledge and skills.
Circular Friesland shows that the circular economy is not just a concept but a tangible, sustainable economy which allows companies to make a profit and create jobs.

Challenges in collaboration upstream and downstream the value chain

SUPPLIERS

EMPLOYEES

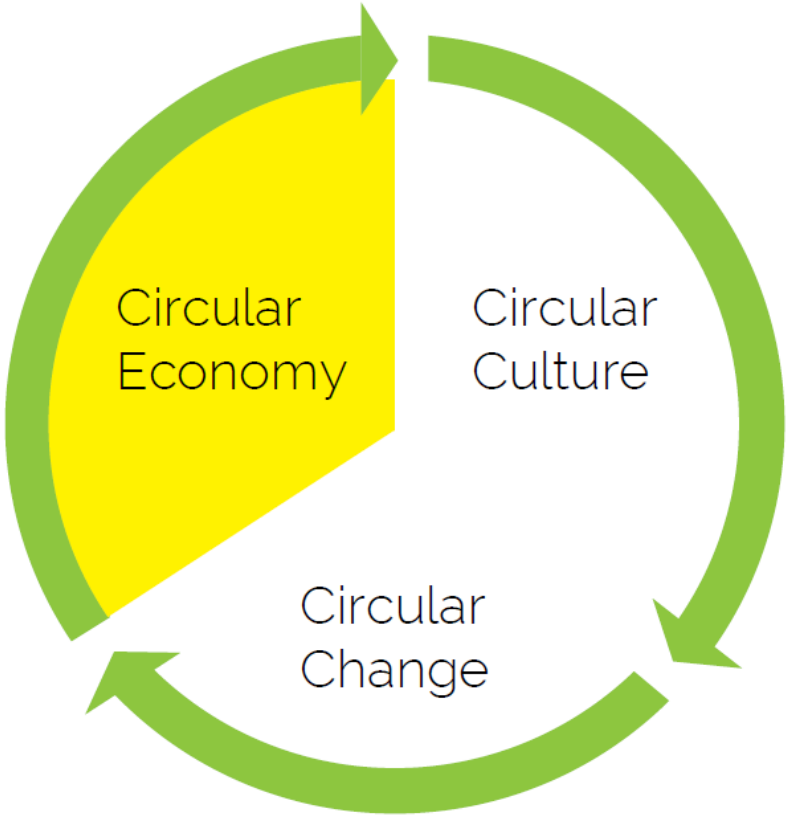
DEVELOPMENT PARTNERS

- - -

CLIENTS

INSTITUTIONAL STAKEHOLDERS

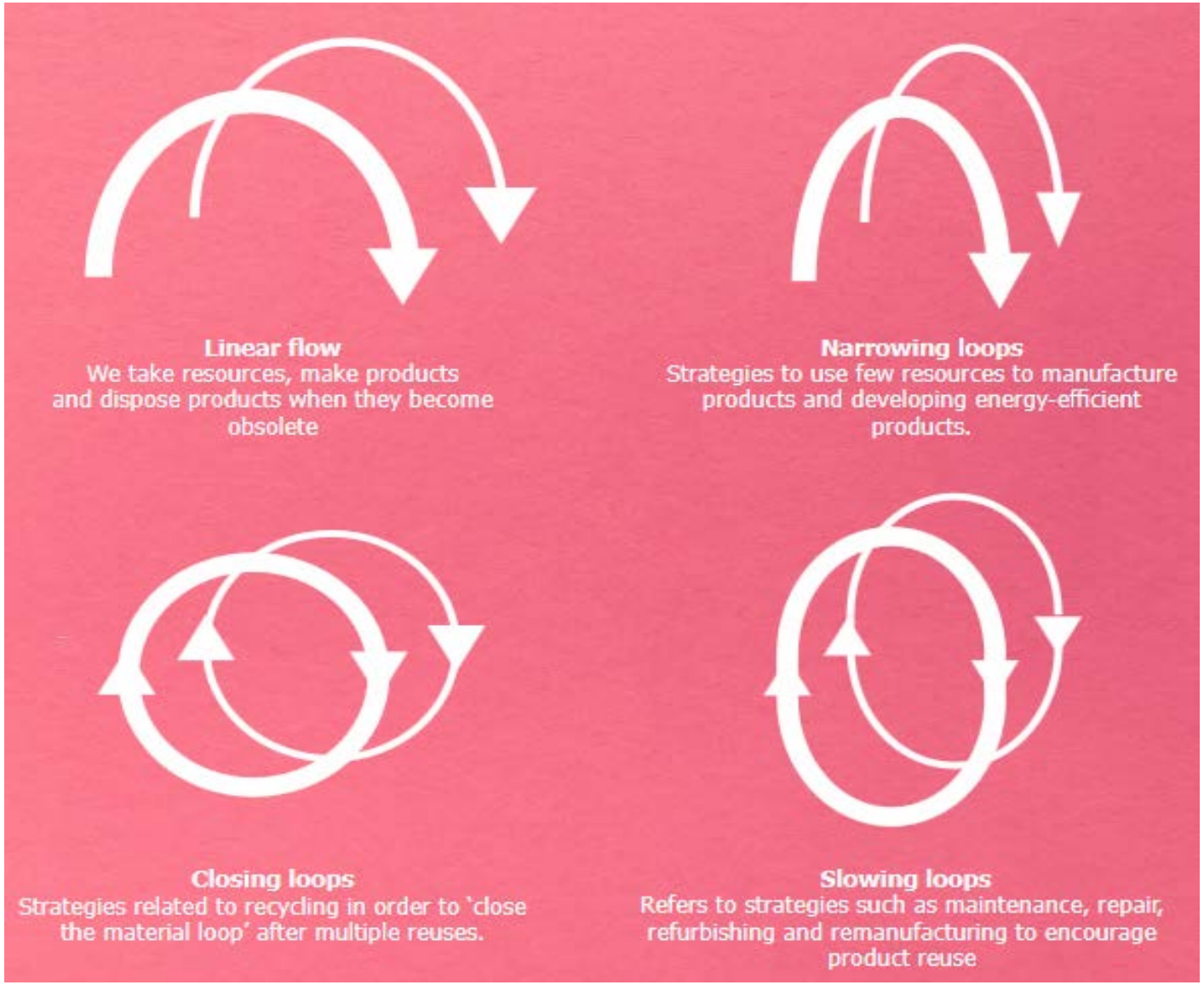
GENERAL PUBLIC



Three dimensions of the circular transition: systemic, organisational and cultural

Concept and scheme :intellectual property of Gm, Circular Change

Developing a circular business model: closing, narrowing and slowing the loops



Kickstarting Circular Business Experimentation
From product ownership to customer experience

Innoboost, TU Delft

http://media.wix.com/ugd/b93010_dba7c3f76b024d3d9d5a0d2357c4aee3.pdf

Essencial challenge: broadening the market for legume-based business

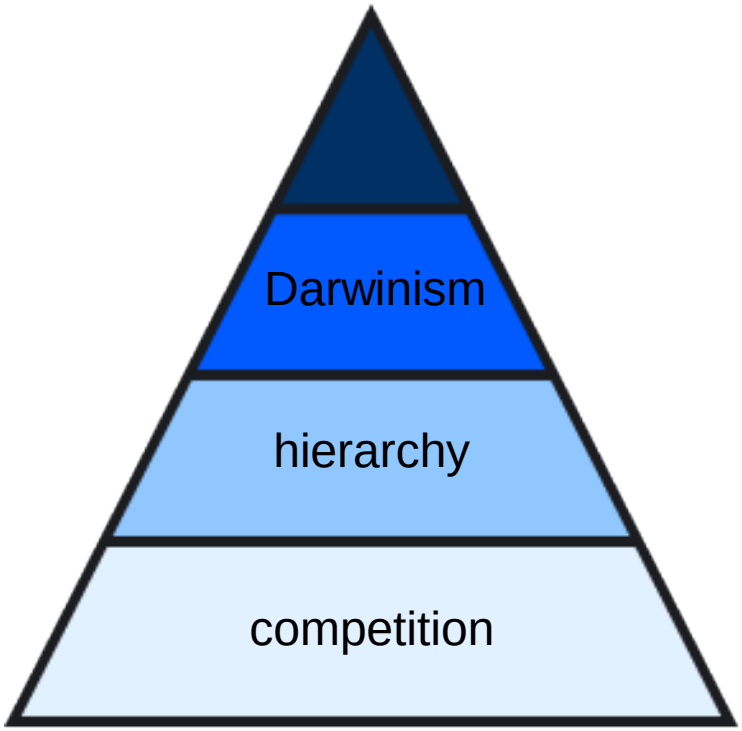
1. REFORM EU AGRICULTURAL POLICY: COMMITTMENTS AND INCENTIVES
2. NATIONAL AND REGIONAL STRATEGIES: COMBINE ENVIRONMENT – TERRITORY with AGRICULTURE and FOOD INDUSTRY
3. WHAT ABOUT HEALTH SYSTEM?
4. ACCELERATE RESEARCH EXPLOITATION THROUGH INCENTIVES: e. g.: SMART SPECIALISATION STRATEGY
5. **<u>CREATE BUSINESS OPPORTUNITIES AND COLLABORATE..!</u>**

- Create fashion, unique experience and reinforce identities of legumes consumption.

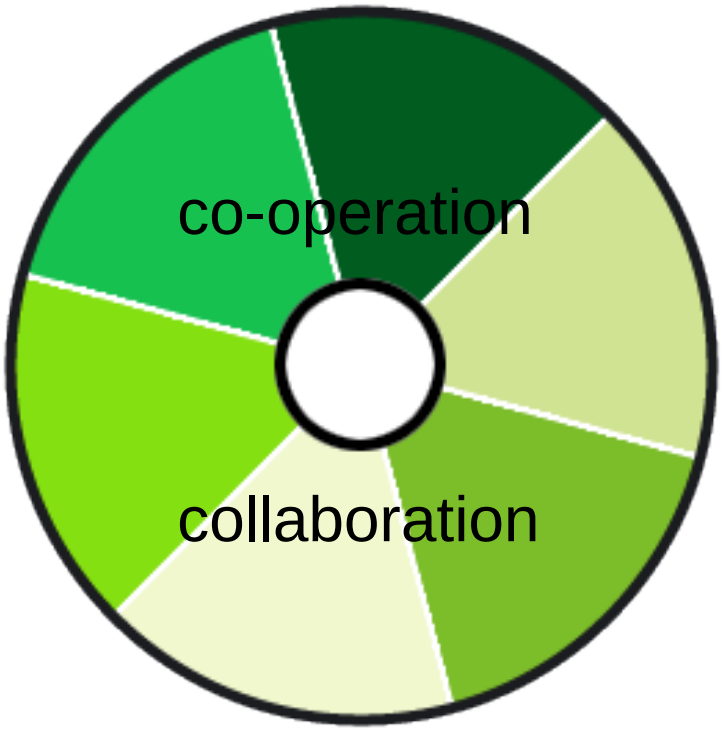
- Concrete examples of public and private actions:

- - innovation partnerships;
- - dedicated incubation programmes and accelerators developing new business models, startups;
- - work on dedicated cooperatives
- - engage private investors (angels);
- - create a dedicated VC fund (calling for EIF!)

Collaboraiton: going beyond scarcity



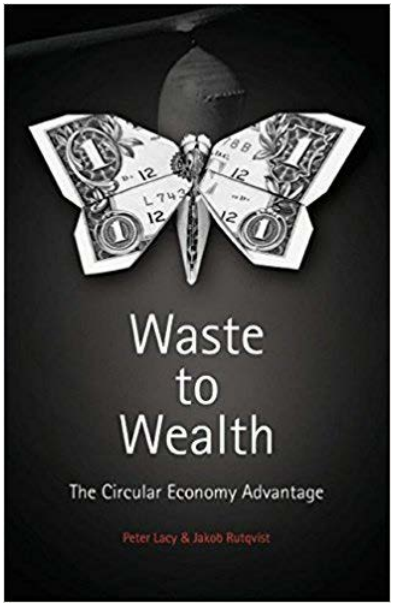
Scarcity



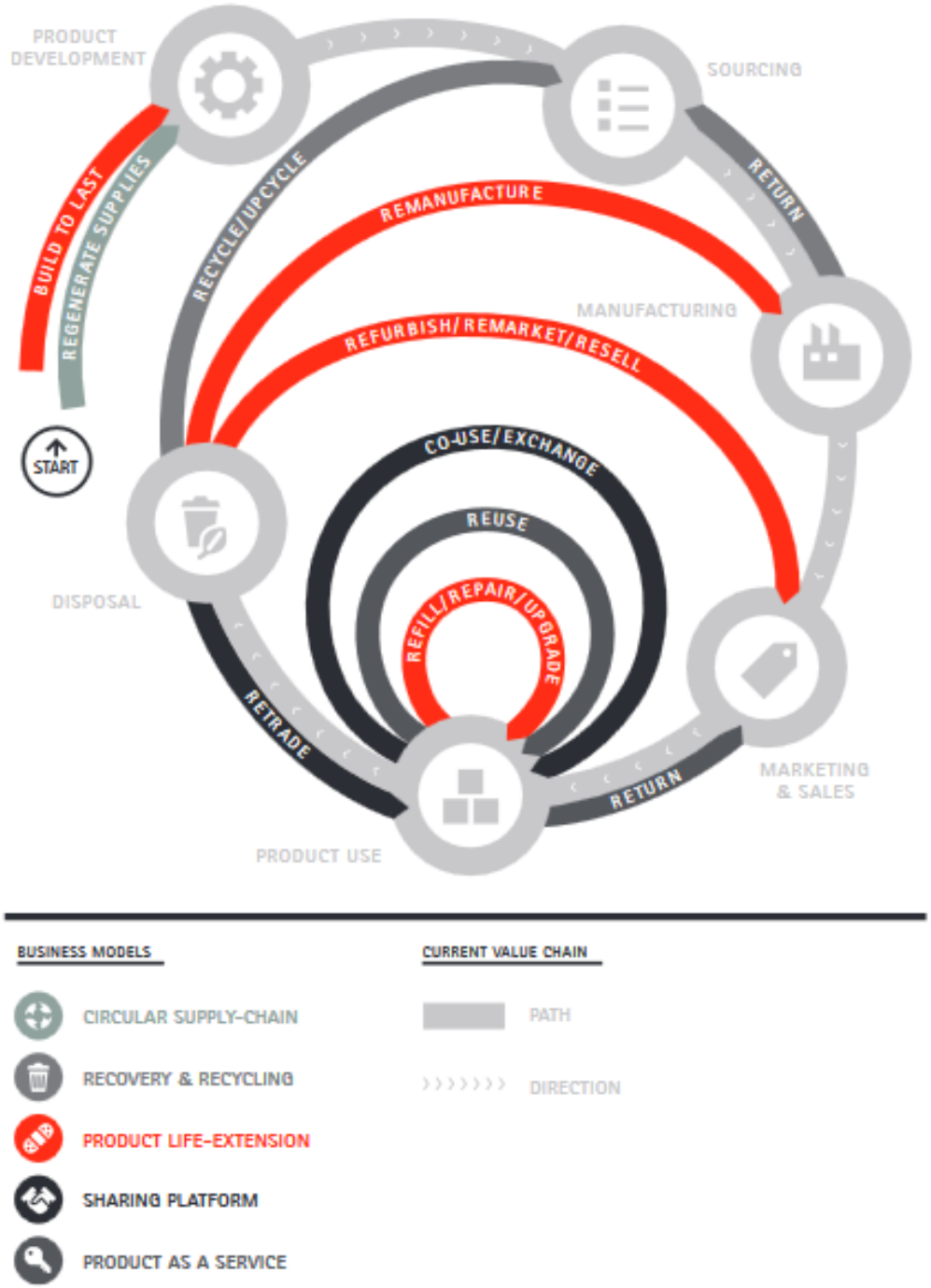
Abundance

Discussion

INNOVATION: START WITH RESEARCH RESULTS EXPLOITAITON AND TRANSFORM BUSINESS MODELS INTO MORE CIRCULAR!



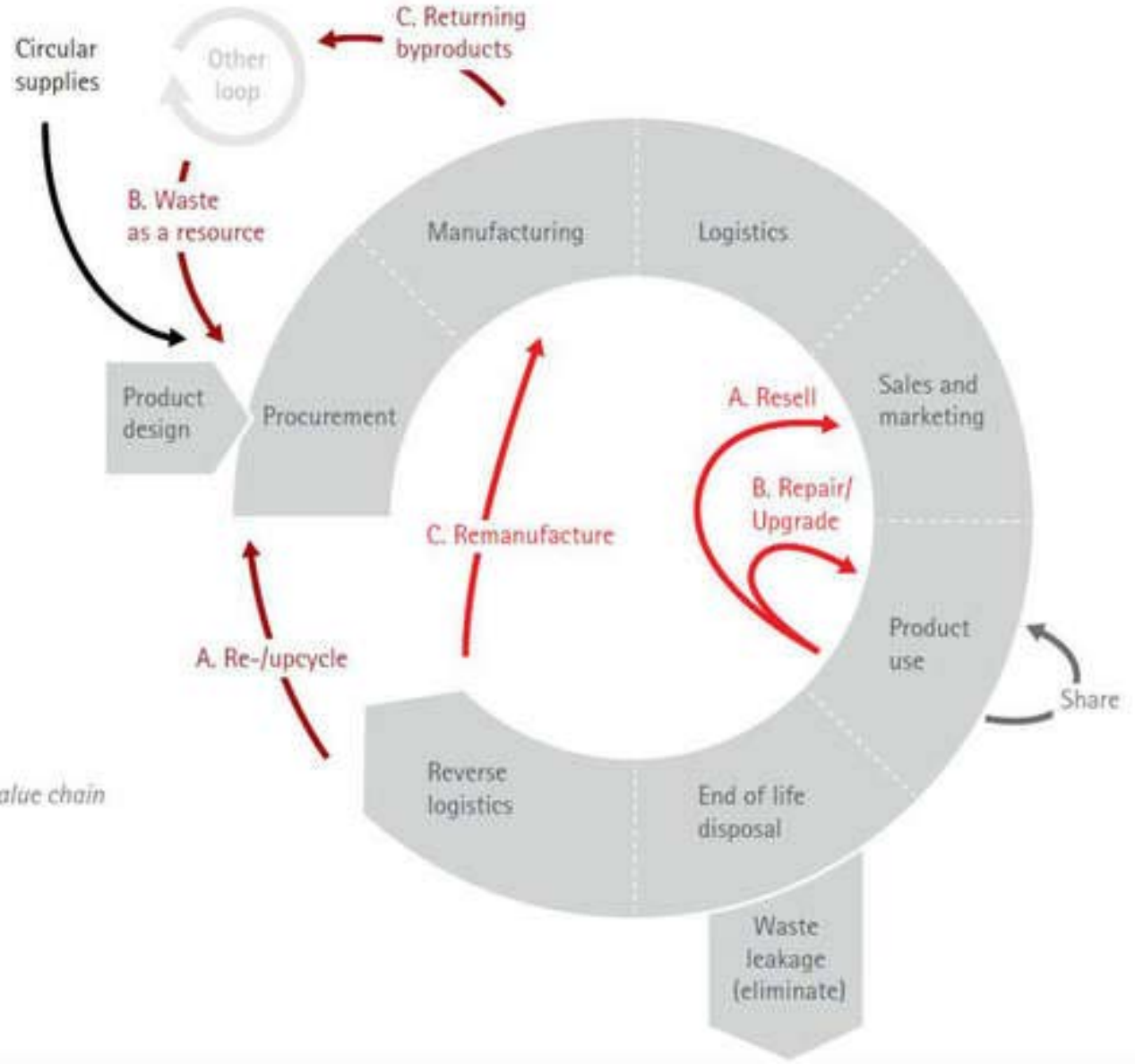
Peter Lacy, Jakob Rutqvist, Accenture 2015



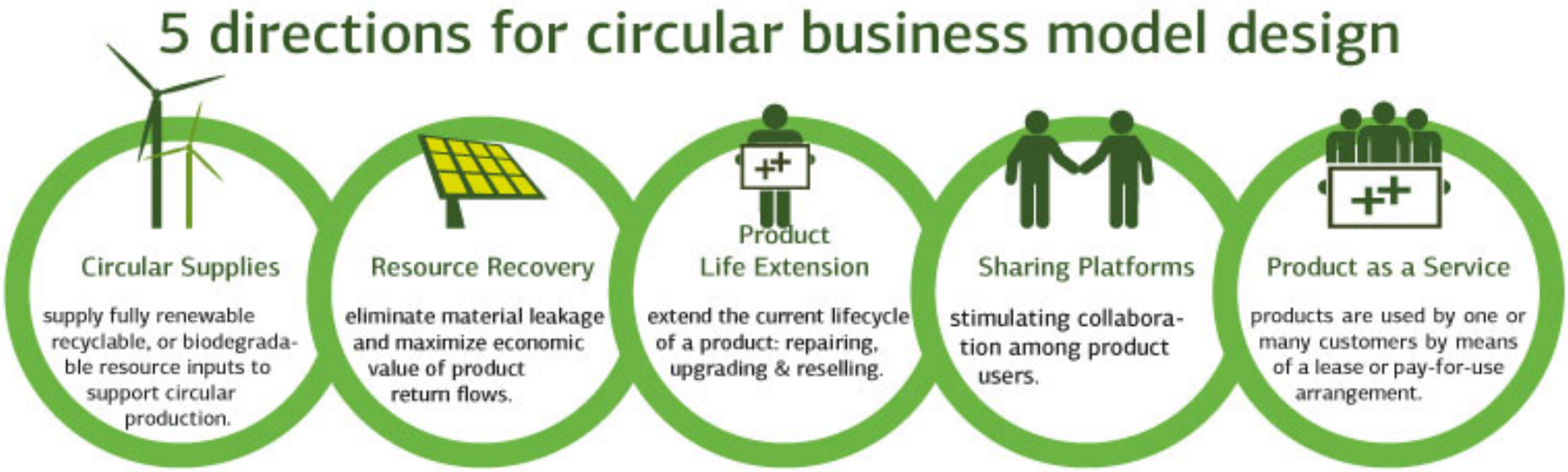
Business Models

- **Circular Supplies:** Provide renewable energy, bio based- or fully recyclable input material to replace single-lifecycle inputs
- **Resource Recovery:** Recover useful resources/energy out of disposed products or by-products
- **Product Life Extension:** Extend working lifecycle of products and components by repairing, upgrading and reselling
- **Sharing Platforms:** Enable increased utilization rate of products by making possible shared use/access/ownership
- **Product as a Service*:** Offer product access and retain ownership to internalise benefits of circular resource productivity

** Can be applied to product flows in any part of the value chain*

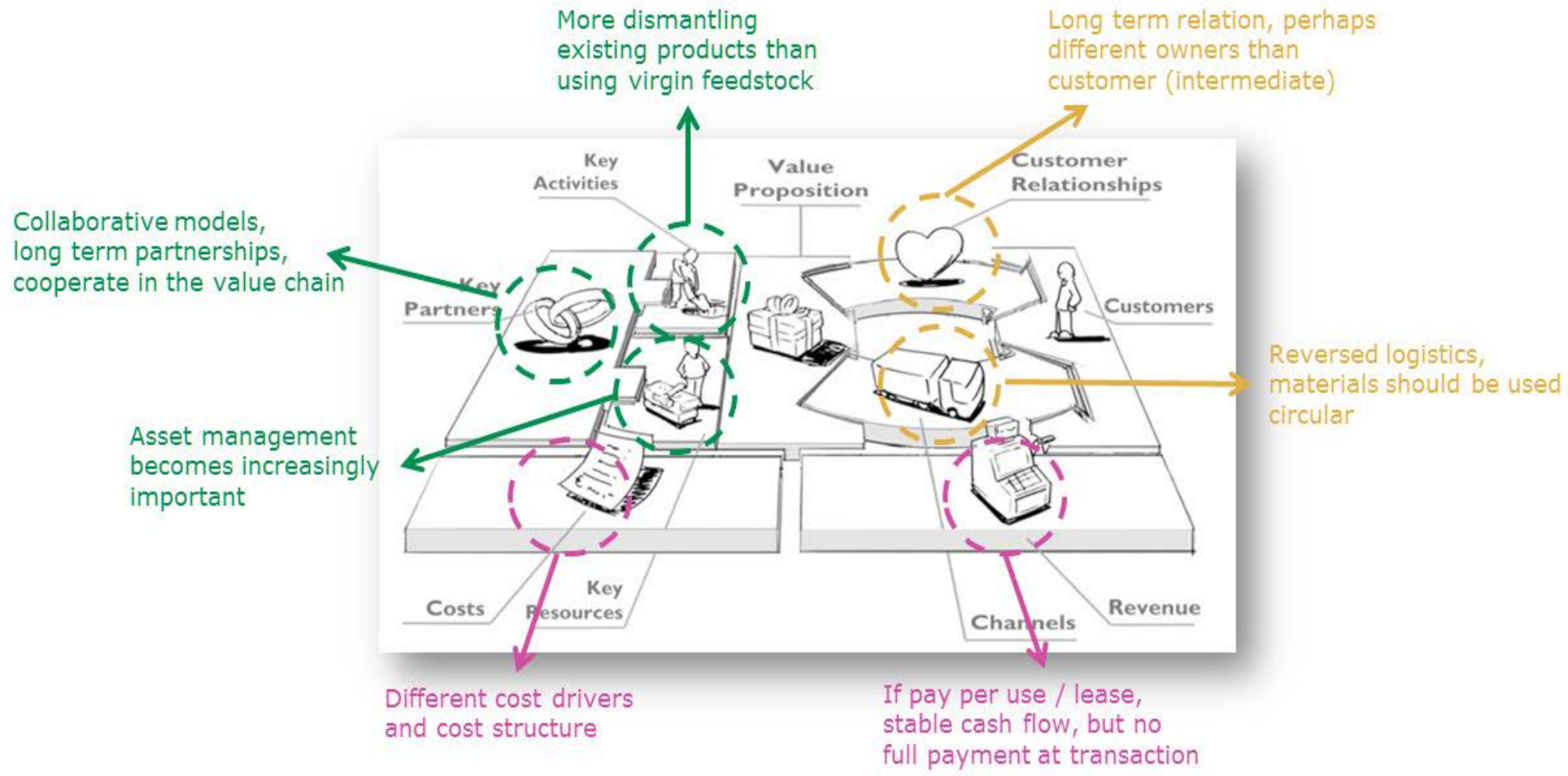


From systemic circularity to circular business models



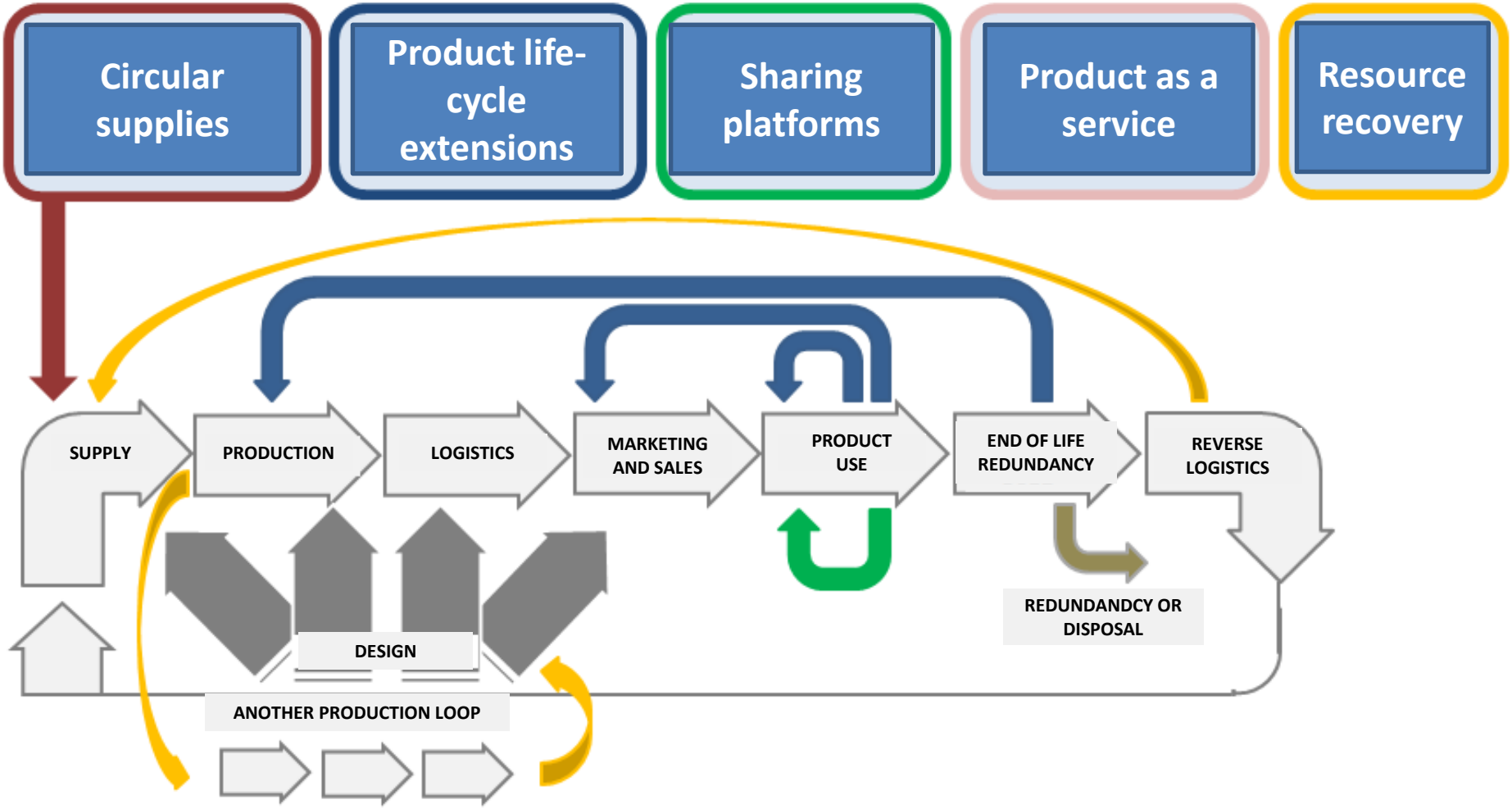
A look into the business model canvas: 7 questions

Seven implications of circular business model transformation



Business model canvas (source: Osterwalder & Pigneur, 2010).

Five generic circular business models in the value chain

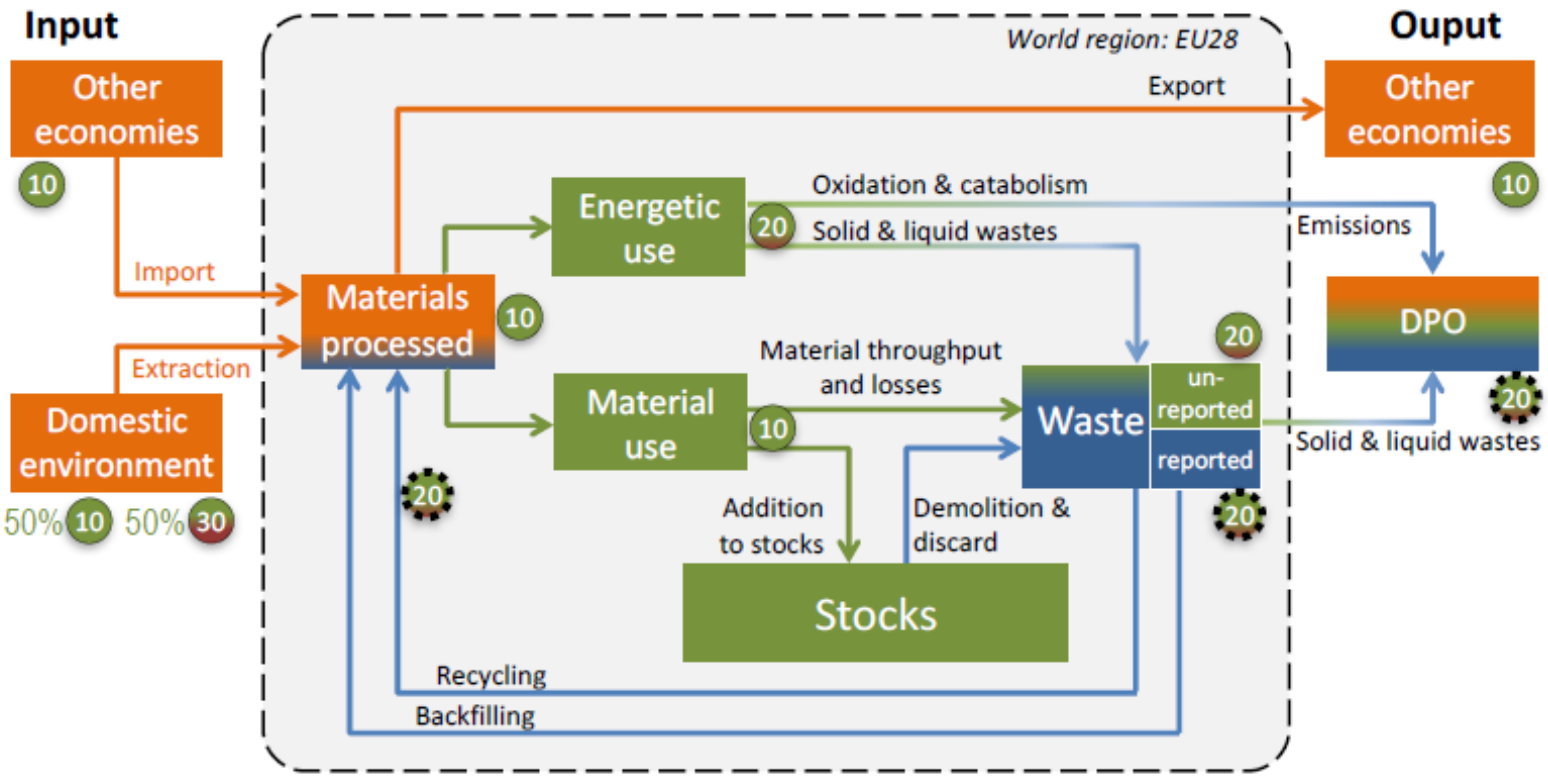


Adapted by Circular Advantage, Accenture, 2014

Case 3: Aquafil‘s road to sustainability

Data for assessing the circularity

2014



EUROSTAT Material flow data

- Biomass 10 (20)
- Fossil energy carriers 10
- Metals & waste rock 10
- Industrial & construction minerals 30

52 sub-categories

Uncertainties:

	Range	Lack of completeness
+/- 10% low	10	10
+/- 20% medium	20	20
+/- 30% high	30	30

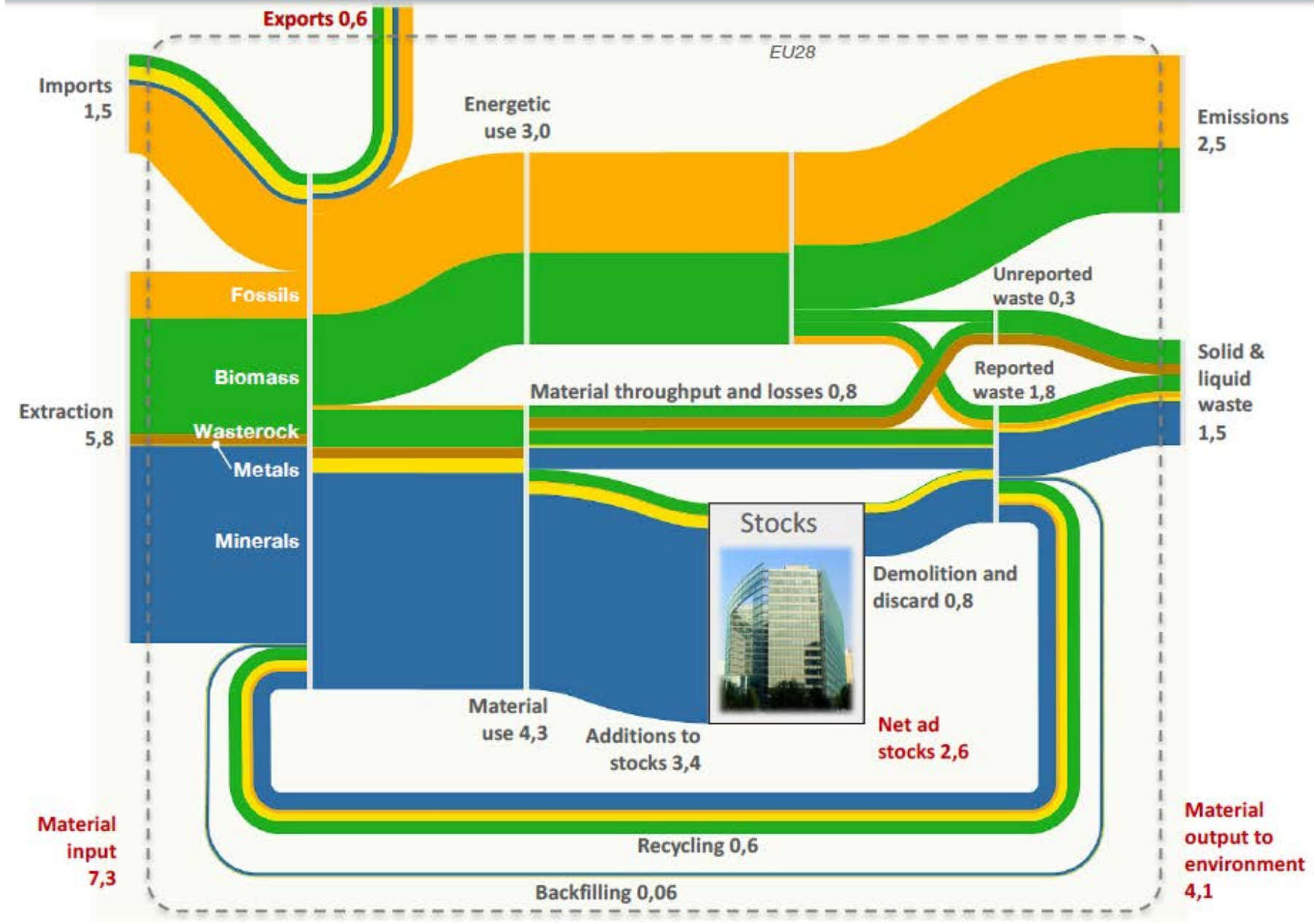
EUROSTAT Waste statistics

- Chemical and medical
- Recyclable
- Equipment
- Animal and vegetal
- Mixed ordinary
- Mineral and solidified
- Metallic

33 sub-categories

Law of Conservation of Mass

EU28 Material Flows in Gt in 2014



Global economy is only 9% circular

The Circularity Gap Report 2019 finds that the global economy is only 9% circular - just 9% of the 92.8 billion tonnes of minerals, fossil fuels, metals and biomass that enter the economy are re-used annually.

Climate change and material use are closely linked. Circle Economy calculates that **62% of global greenhouse gas emissions** (excluding those from land use and forestry) **are released during the extraction, processing and manufacturing of goods to serve society's needs**; only 38% are emitted in the delivery and use of products and services.

Yet global use of materials is accelerating. It has more than tripled since 1970 and could double again by 2050without action, according to the UN International Resource Panel.

Circle Economy's CEO, Harald Friedl, said: "**A 1.5 degree world can only be a circular world**. Recycling, greater resource efficiency and circular business models offer huge scope to reduce emissions. A systemic approach to applying these strategies would tip the balance in the battle against global warming.

Three key strategies for the circular economy

1. Optimising the utility of products by maximising their use and extending their lifetime.

Ridesharing and carsharing already make it less important to own a car. Autonomous driving will accelerate this trend, potentially increasing the usage of each vehicle by a factor of eight. At the same time electric powertrains, intelligent maintenance programmes and software integration can enhance the lifetime of cars.

2. Enhanced recycling, using waste as a resource.

By 2050 there will be an estimated 78 million tonnes of decommissioned solar panels. Modular design would enable products to be easily disassembled, components to be re-used and valuable materials to be recovered to extend their economic value and reduce waste.

3. Circular design, reducing material consumption and using lower-carbon alternatives.

Bamboo, wood and other natural materials have the potential to reduce dependence on carbon-intensive materials such as cement and metals in construction. Instead of emitting carbon, these materials store it and will last for decades. They can be burnt to generate energy at the end of their life.

Some recommendations to governments

- Abolish financial incentives which encourage overuse of natural resources, such as subsidies for fossil fuel exploration, extraction and consumption;
- Raise taxes on emissions, excessive resource extraction and waste production, for example by implementing a gradually increasing carbon tax;
- Lower taxes on labour, knowledge and innovation and invest in these areas.
- Lower labour taxes will encourage labour-intensive parts of a circular economy such as take-back schemes and recycling.

HOW CAN WE CHANGE BUSINESS MODELS TO BECOME MORE SUSTAINABLE AND MORE CIRCULAR?

Business model design

The Business Model Canvas

Designed for:

Designed by:

On:

Iteration:

Key Partners

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

Key Activities

What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

Value Propositions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

Customer Segments

For whom are we creating value?
Who are our most important customers?

Key Resources

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

Channels

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

Cost Structure

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

Revenue Streams

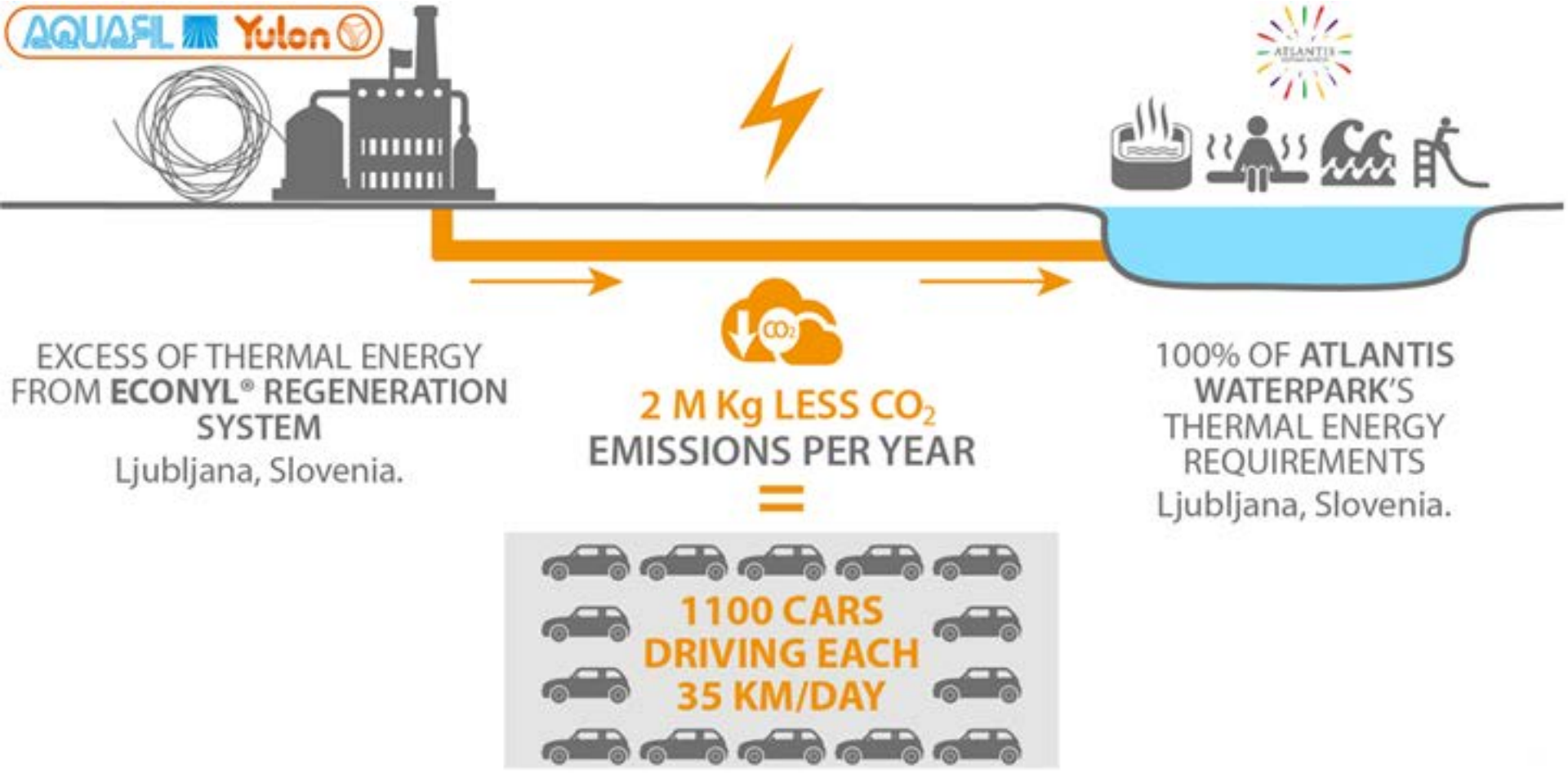
For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

www.businessmodelgeneration.com

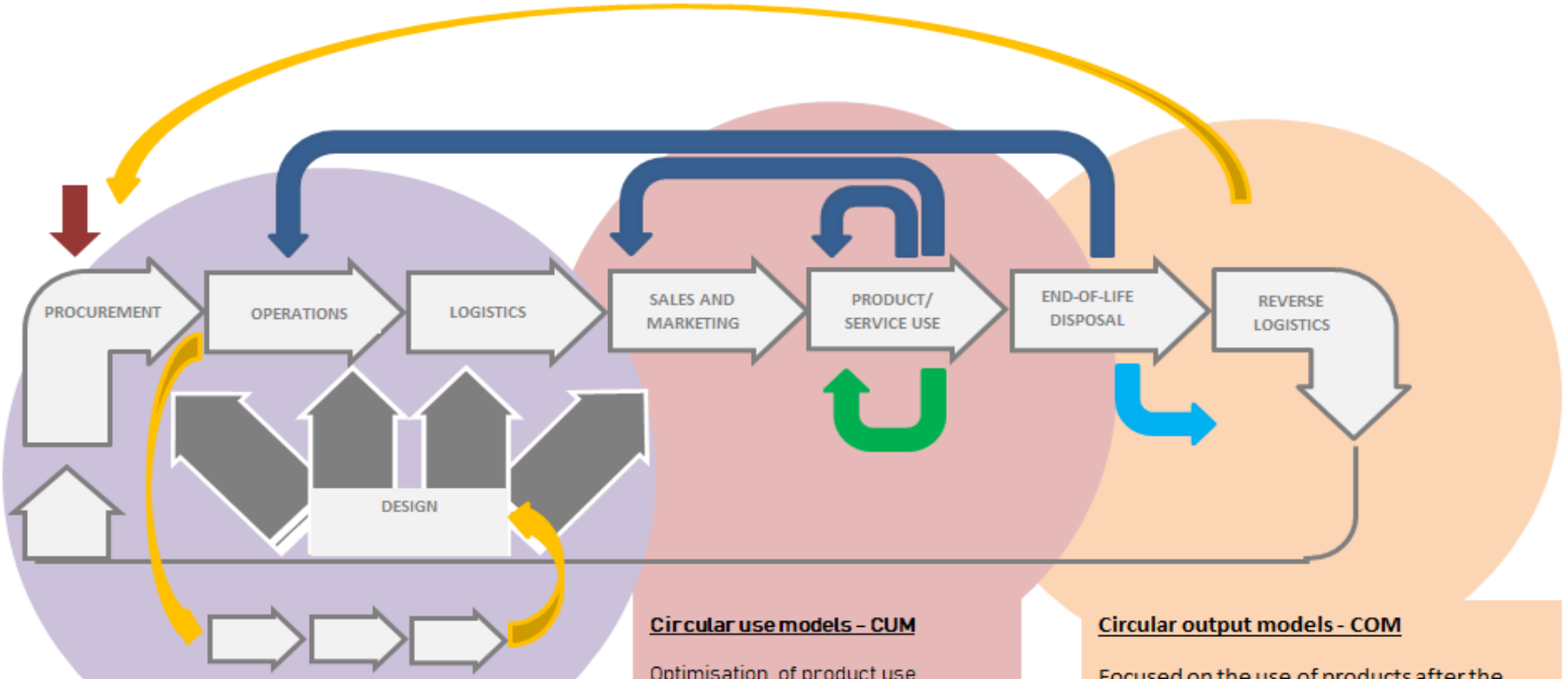
The ECONYL® Regeneration System

One very simple example of a cross-sector collaboration

THE ART OF COLLABORATION BECOMES FUNDAMENTAL IN EVERY ORGANISATION



Five generic business models and three financing profiles in a value chain



Circular innovation models - CIM

Product- and process- related innovation, enabling reuse and regeneration of end-of-life disposal from other value chains.

Circular use models – CUM

Optimisation of product use, maintenance of the added value of the product (life extensions, maintenance); focused on total lifecycle ownership and liability; or product-service systems or sale-and-lease-back models.

Circular output models - COM

Focused on the use of products after the end of their life cycle, regeneration and reuse in subsequent value chains.

Evolutionary practices

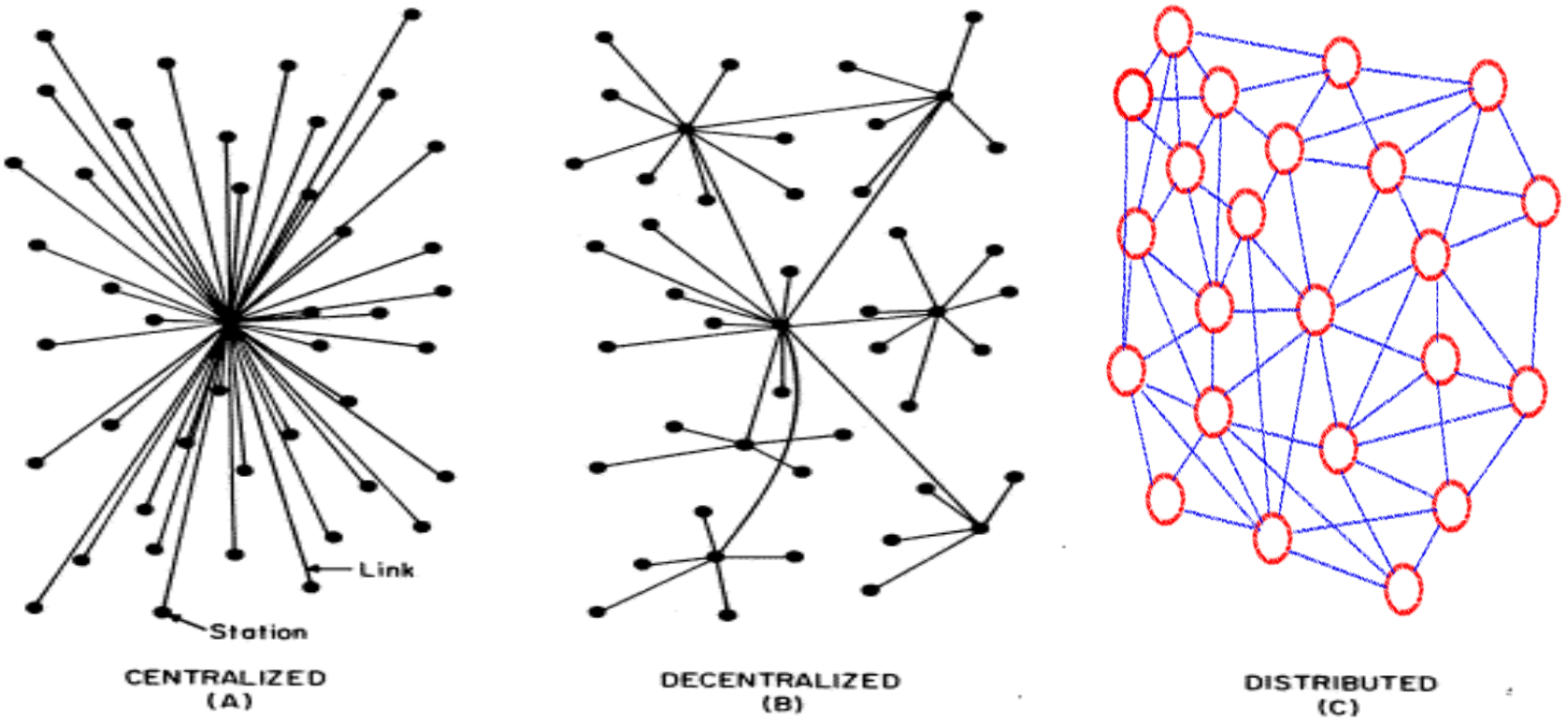
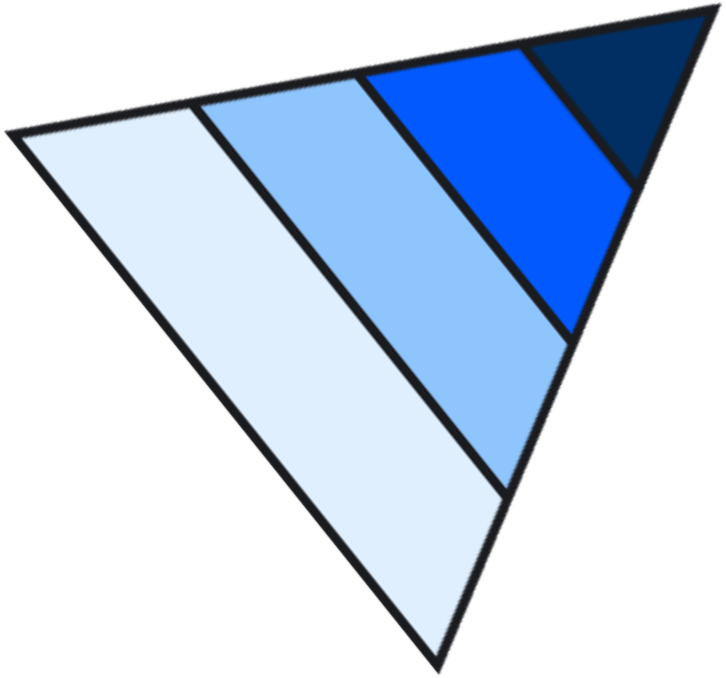
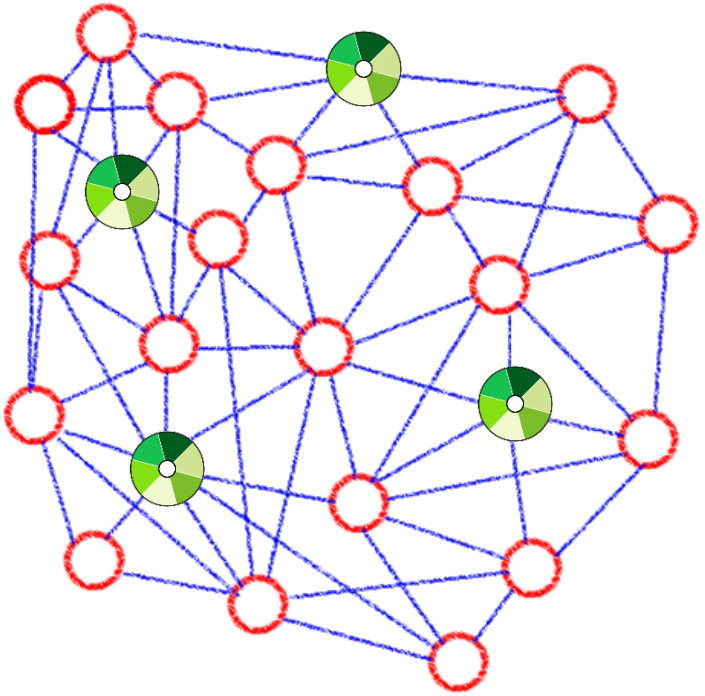


FIG. 1 — Centralized, Decentralized and Distributed Networks

Distributing complexity enables people to think and act with agility in the moment, to create, to innovate, to solve problems. **More is more.**

Beyond Hierarchy





The Evolutionary Leap:

Less is more ⟶ More is more