# Circular Events 2021 Kickoff

BUSINESS FINLAND







### Agenda

- Finnish BioCircular Innovation Roadmap
- Circular Nordics 2021
   Einar Kleppe Holthe, Natural State
- Governmental circular collaboration
   Inger Johanne Wiese, Norwegian Ministry of Climate and Environment
- BioCircular Finland opening words
  Marika Ollaranta, Business Finland
- Finnish BioCircular Innovation Roadmap
  Jarmo Heinonen, Business Finland
- Future of biomaterials
  Jussi Manninen, VTT
- Kick-start your bio-based business in Finland Helvi Väisänen, Business Finland
- Bio-based solutions company cases:
  - Pyroll Packaging by Tapani Holappa
  - NordShield by Emmi Kavander
  - Spinnova by Pia Qvintus

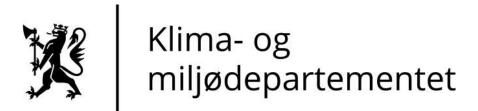
- Nordic perspective on circular economy
   Cathrine Barth, Circularities
- Circular industrial locomotives
   Susanne M. Nævermo-Sand, Celsa Nordic
- Visual intelligence as fuel for circular innovation Hanne Wetland, Knowit
- Panel discussion
   with Cathrine Barth (Circularities), Susanne M.
   Nævermo-Sand (Celsa Nordic), Hanne Wetland
   (Knowit) and Marthe Haugland (Nordic Innovation)
- The Nordic Circular Hotspot Partnership Program Einar Kleppe Holthe, Natural State
- Q&A dialogue with the audience



### Agenda

BUSINESS **FINLAND** 





































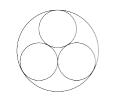




Nordic

Innovation





Natural State



### Circular Nordics 2021

Founder & CEO
Natural State





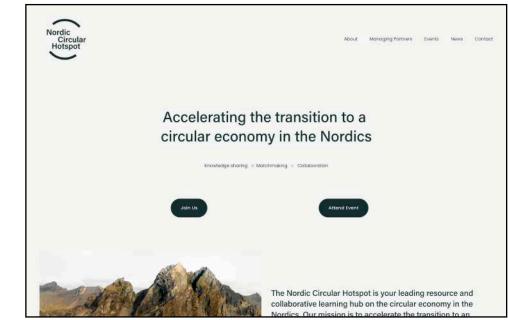


### Building a Circular Nordics

Circular economy, often referred to simply as *circularity*, is an economic system aimed to design out waste and pollution, keep products and materials in use, and regenerate natural systems. Even though global awareness is finally rising, most people don't know what circular economy is, and the market is still very fragmented and hard to navigate. With co-funding from Nordic Innovation, the Nordic Circular Hotspot aims to bridge the knowledge gap and contribute in a meaningful way to:

- Reinvent how the Nordics design, produce and market products;
- Rethink how the Nordics use and consume goods and services;
- Redefine growth in the Nordics and what is possible through reuse, reduction, repairing and regeneration.











Marika Ollaranta Business Finland (FIN)



Bjarni Herrara Circular Solutions (IS)



Einar Holthe Natural State (NO)



Cathrine Barth Circularities (NO)



Hrund Gunnsteinsdóttir Festa (IS)



Harpa Júlíusdóttir Festa (IS)



Isabella Holmgaard Lifestyle & Design Cluster (DK)



Kim Hjerrild Lifestyle & Design Cluster (DK)



Peter Michel Heilmann WholistiQ Holding (NL)



### Change Management

#### **Collaboration is key**

During three months we have hosted events with speakers from leading global companies











































































































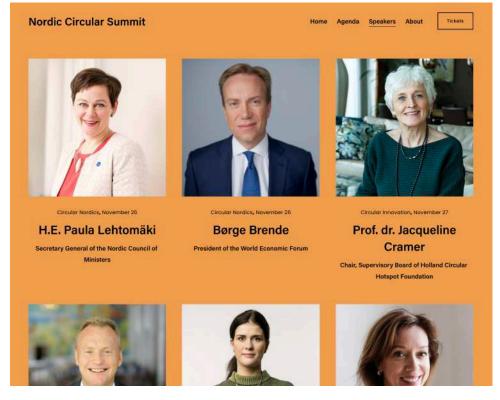


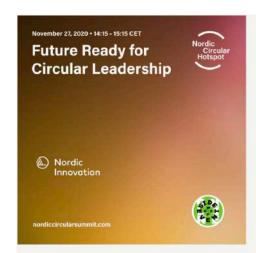


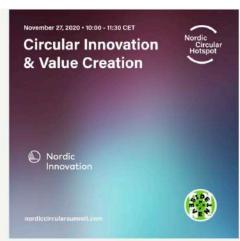


### Nordic Circular Summit 2020



















The Nordic Circular Summit is a two-day event hosted by , with a mission to explore the tremendous circular opportunities that the region has to offer.

The 2020 summit was a live event on November 26 and 27, 2020, spread over 10 different sessions with topics including circular cities, ocean solutions, fashion and furniture, finance, energy, the food sector, manufacturing and more. Nordic Circular Summit 2020 was a milestone event with over 1,000 delegates from around the world, comprising of two engaging days of interaction, inspiration, and information sharing.

The summit site had 6.8k unique visitors, and content that engaged 62800 people on Facebook.



# Governmental collaboration for a circular transition

Inger Johanne Wiese
Senior Advisor
Ministry of Climate and Environment







# BioCircular Finland opening words

Marika Ollaranta
Head, BioCircular Programme
Business Finland



BUSINESS FINLAND



# Finnish BioCircular Innovation Roadmap

Jarmo Heinonen
Senior Director, Innovation Ecosystems,
Industries, Business Finland



BUSINESS FINLAND



## FINLAND LEADS THE WAY TOWARDS BIO AND CIRCULAR ECONOMY

#### **VISION**

Finland is showing the way for solving global challenges and offers solutions for better tomorrow.

Finnish bio and circular solutions are utilized globally.

#### **PURPOSE**

Develop competitive bio and circular based solutions and ecosystems to solve global climate challenges

Finnish solutions, network and expertise matches demand and opportunities in the international markets

National and international networking, EU funding, national banks, investors

## FINNISH BIO & CIRCULAR ECONOMY BUSINESS ECOSYSTEMS

### **SUSTAINABLE TEXTILES**

1st generation cellulose fibre industrial production

1st recycled textile ecosystem operating

Utilization of recycled textiles fibres in different end-user applications

#### **PACKAGING**

Bio-based barriers

Traceability – digital elements

New business models – Package as a service

#### **PLASTICS**

Market creation, shaping of plastics

Cross-sectoral R&D together with customers in different value chains

Substitutes or radical innovations?

From mechanical to chemical recycling

Life cycle of bio-based plastics

### **BIOBASED SOLUTIONS**

Nanocellulose based biomedical solutions

Biocomposites

Biofuels

Biochemicals Ligning based binders

**Proteins** 

## CIRCULAR VALUE ADDED STREAMS

Towards zero-waste processes

Metals recycling

Batteries recycling

Carbon neutral production – minimizing CO2

Nutrient recycling

**SYNTHETIC BIOLOGY** 

NEW BUSINESS MODELS & DIGITAL TRANSFORMATION

**BUILDING & CONSTRUCTION** 

**CLIMATE** 

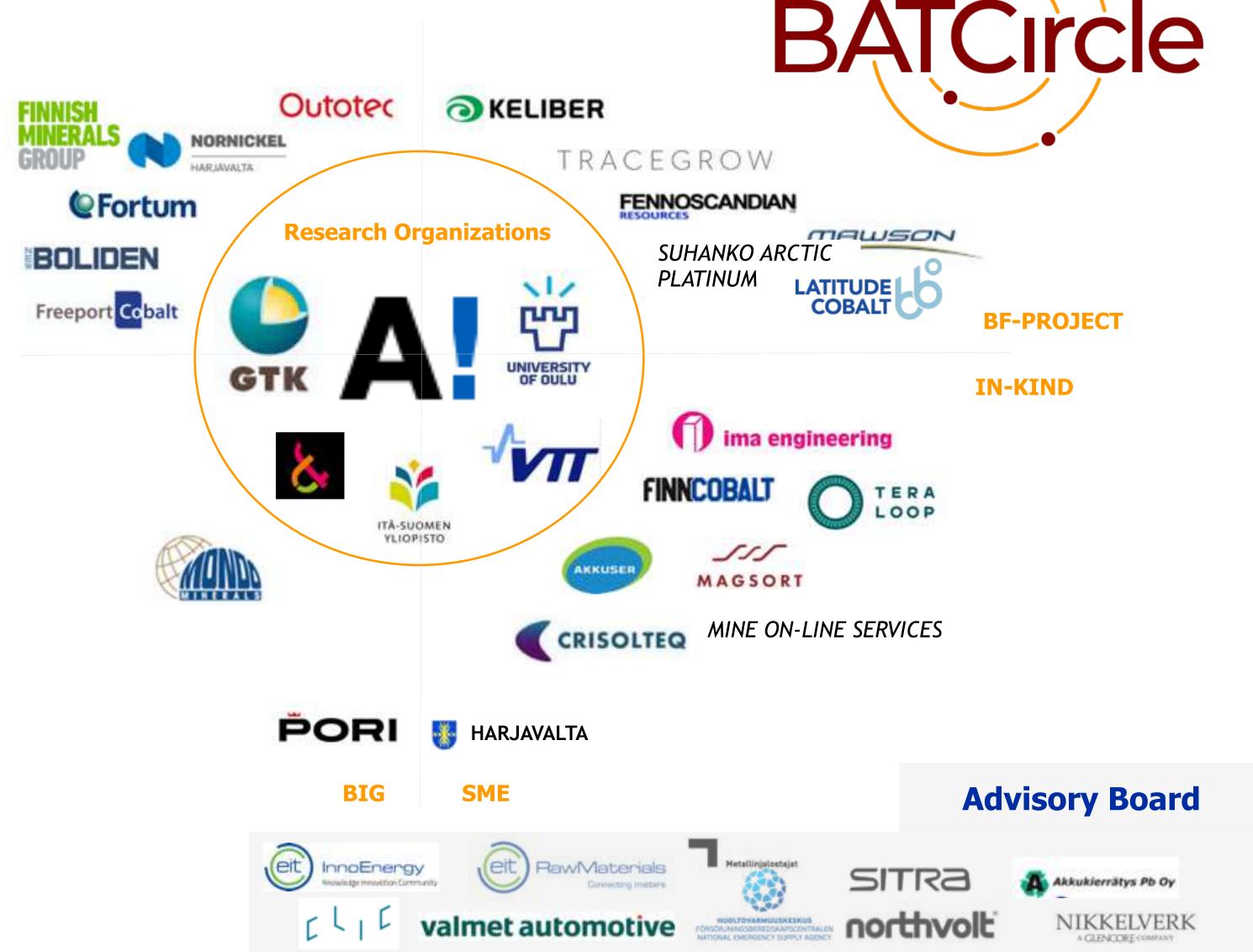
## **Example of Finland-based Circular Ecosystem**

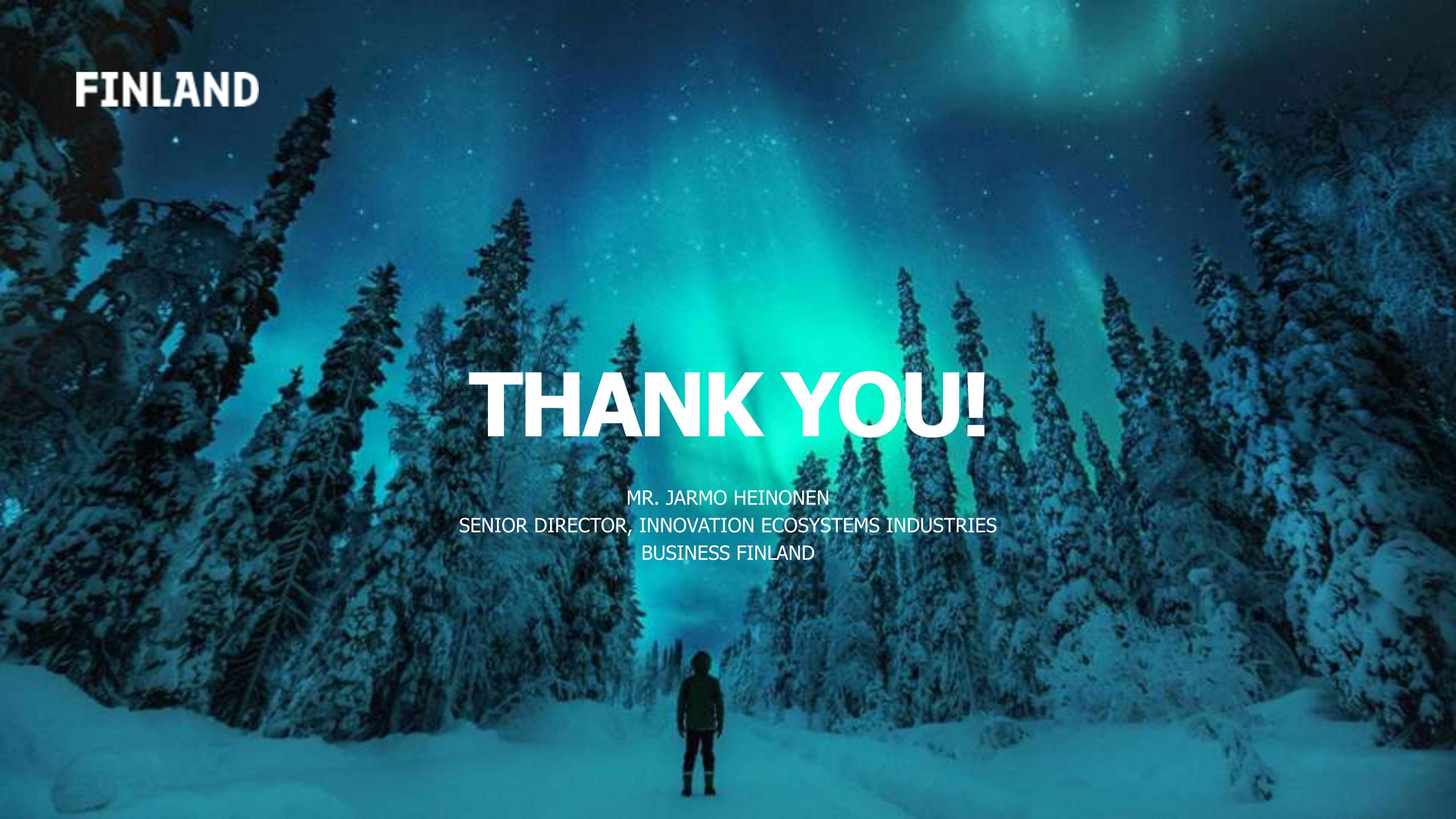
## Joint industry-academia project

- 8 large companies
- 14 SMEs
- 2 cities
- 4 universities
- 2 Research centers (GTK,VTT)
- 21 M€ budget

#### **Key topics**

- Sustainable primary resources
- Value addition in metal refining
- Battery recycling
- Precursors and active materials
- Circular business ecosystems







### Future of biomaterials

Jussi Manninen

Executive Vice President

VTT Technical Research Centre of Finland







# Kickstart your bio-based business in Finland

Helvi Väisänen Senior Adviser Business Finland



BUSINESS
FINLAND

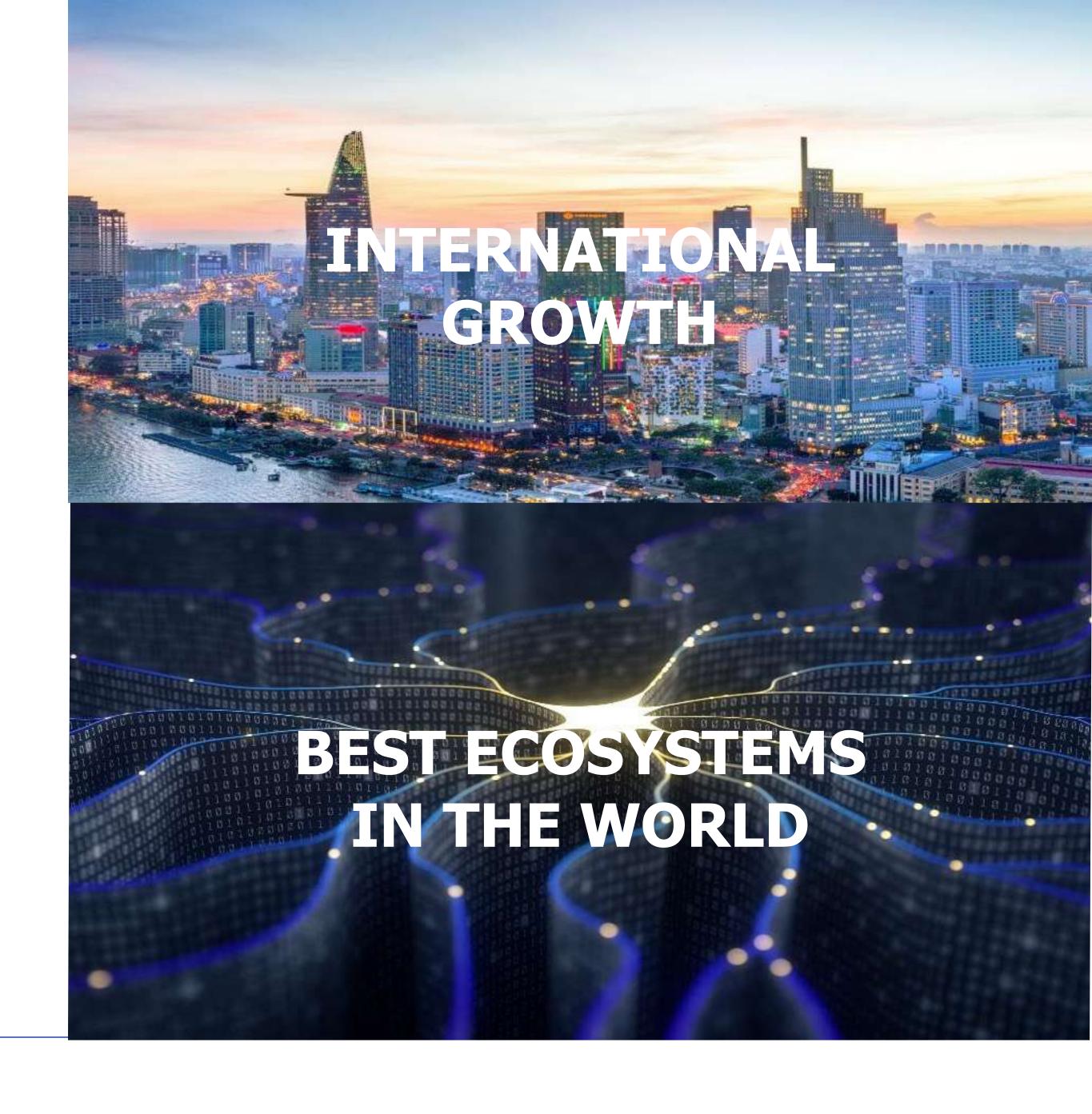


## BUSINESS FINLAND MISSION IS SUSTAINABLE GROWTH, RENEWAL AND SUCCESS

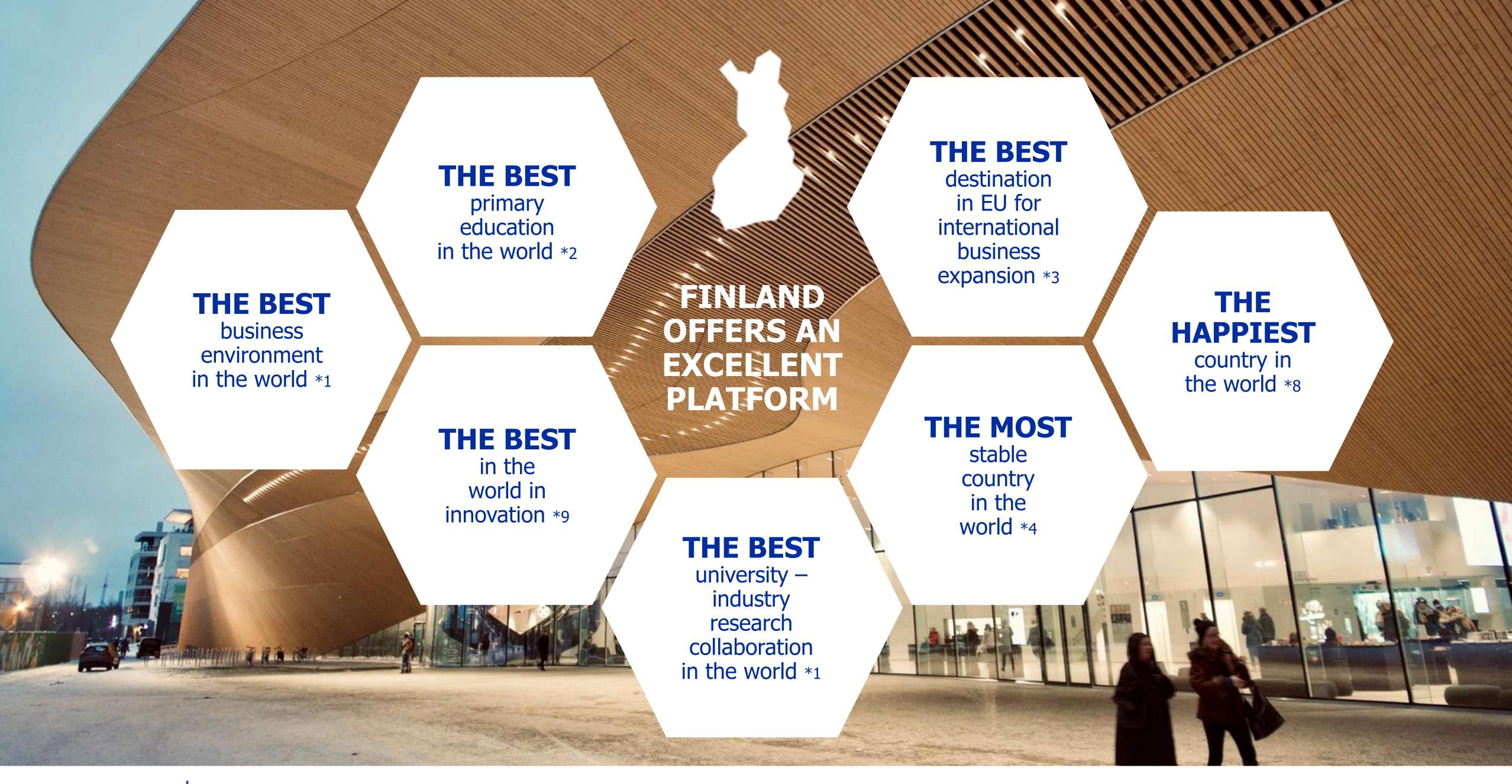
Promoting Innovation
Promoting Exports for SMEs
Attracting foreign investments and travelers

#### Tools

- Research and innovation funding
- Guidance and coaching
- Networking and contacts
- Expertise and vision of our domestic and international networks
- Theme programs







#### **BUSINESS OPPORTUNITIES IN**



## BIO & CIRCULAR ECONOMY

Kick start your bio-based business.



#### **CLEANTECH**

Greenest country in the world.



#### **HEALTH**

A living lab for global cures.



## ICT AND DIGITALIZATION

Brainpower for your next big thing.



## TRAVEL & TOURISM

Fast growing, safe and sustainable business environment



## FINLAND — BASE FOR INTERNATIONAL BIOPRODUCTS MANUFACTURERS

































## THE NEXT GENERATION OF BIOBASED PACKAGING COMES FROM FINLAND

#### **UPM**

BioVerno naphtha can be used in bioplastics for paperboard packaging.
Lappeenranta biorefinery utilises tall oil for the new bioplastic cartons.

#### **KOTKAMILLS**

ISLA® Duo is an easily recyclable cupstock based on dispersion barrier.

• Winner of the NextGen Cup Challenge 2018.

#### **STORA ENSO**

Fibre-based, 100% recyclable EcoFishBox is free from expanded polystyrene with minimal plastic content.

- World Star Winner 2017
- World Star Sustainability
   Award Gold Medal 2017

#### **HUHTAMÄKI**

Signed a deal to supply McDonald's with sustainable paper straws in the UK and across Europe.

## RESEARCH-BASED SPIN-OFFS WITH REVOLUTIONARY PACKAGING SOLUTION



#### **PAPTIC®**

is a new material replacing paper and plastic in packaging.

- Winner of Bio-basedProduct of the Year 2017
- 2nd position in Bio-based
   Material of the Year 2017
- Winner of the ExpoLive
   Innovation Award Grant

#### **WOODLY®**

is a new type of woodbased packaging material that can be used to substitute plastics.

#### **SULAPAC®**

is a biodegradable and microplastic-free material that has plastic-like properties, yet it biodegrades completely.

- World Star Winner 2017
- Winner of Green Alley Award 2017

#### **JOSPAK**

offers a recyclable cardboard tray with 85% less plastic.

WorldStar 2019 and ScanStar 2018 awards



## FINLAND - THE EPICENTER OF BIOBASED GROWTH

# NEW, COMMERCIAL ADVANCED PRODUCTS

- 100% renewable diesel
- Microfibrillated cellulose
- Pyrolysis oil
- High-quality barrier board
- Cross laminated timber
- Kraft lignin

#### NEW PRODUCT DEVELOPMENTS

- Wood based textiles
- The next generation bio-based packaging
- Bio-composites
- Lignin applications
- Bio-based chemicals

## OPEN INNOVATION ECOSYSTEMS

- ExpandFibre
- Cliq Innovation
- Telaketju- Co-Innovation of circular economy textiles
- SEED –digital transformation of biobased industry
- FinCeres



INVEST IN FINLAND

Regional industry parks Ecosystem platform O

National expertise

entre

EU research

infrastructure

National flag ship

project







# Bio-based solutions company cases









# Bio-based solutions company cases

**Tapani Holappa**Sales Director
Pyroll Packaging







# Bio-based solutions company cases

Emmi Kavander
Chief Communications Officer
NordShield (Nordic BioTech Group)







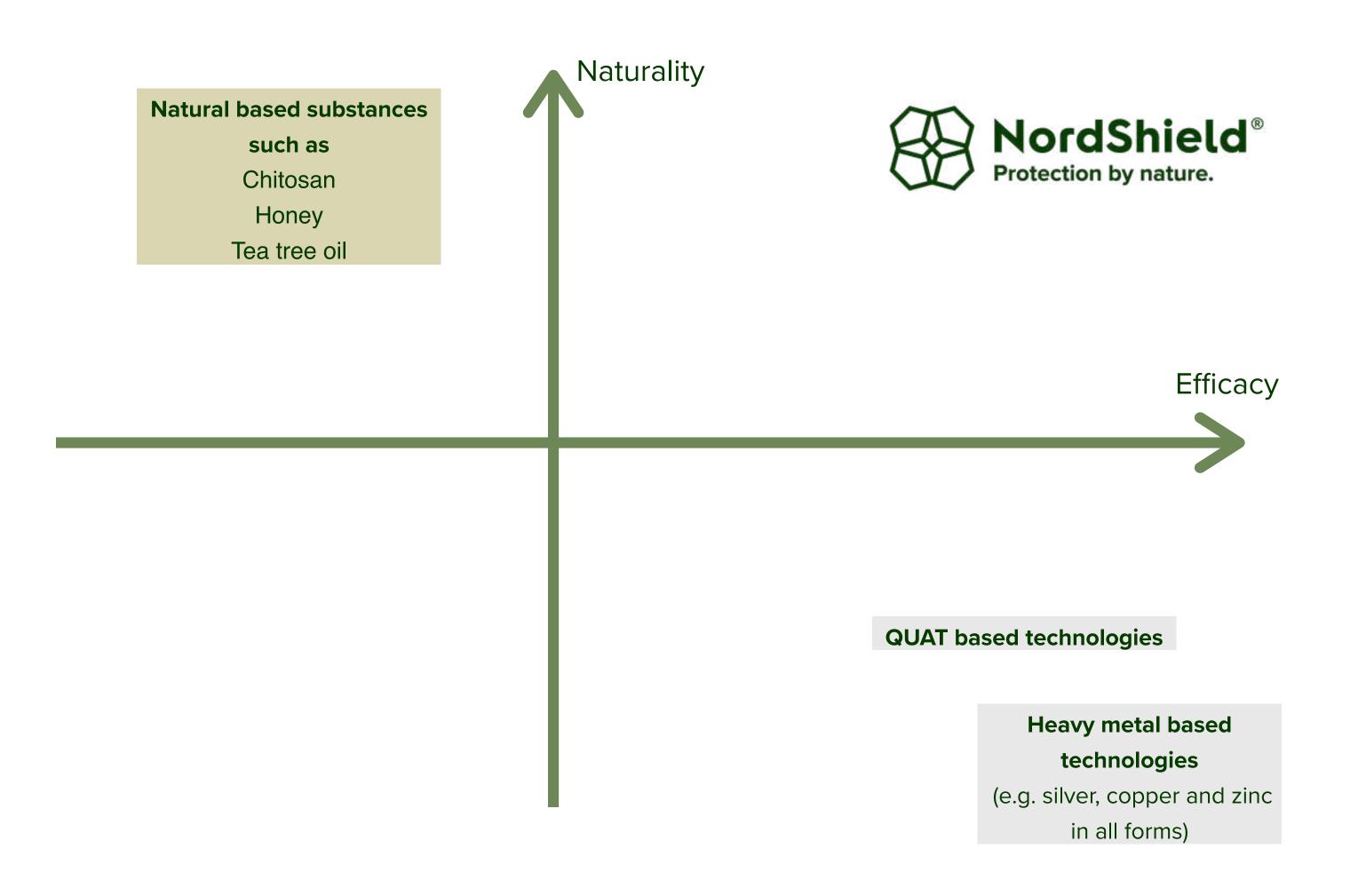






### NordShield® antimicrobial technology:

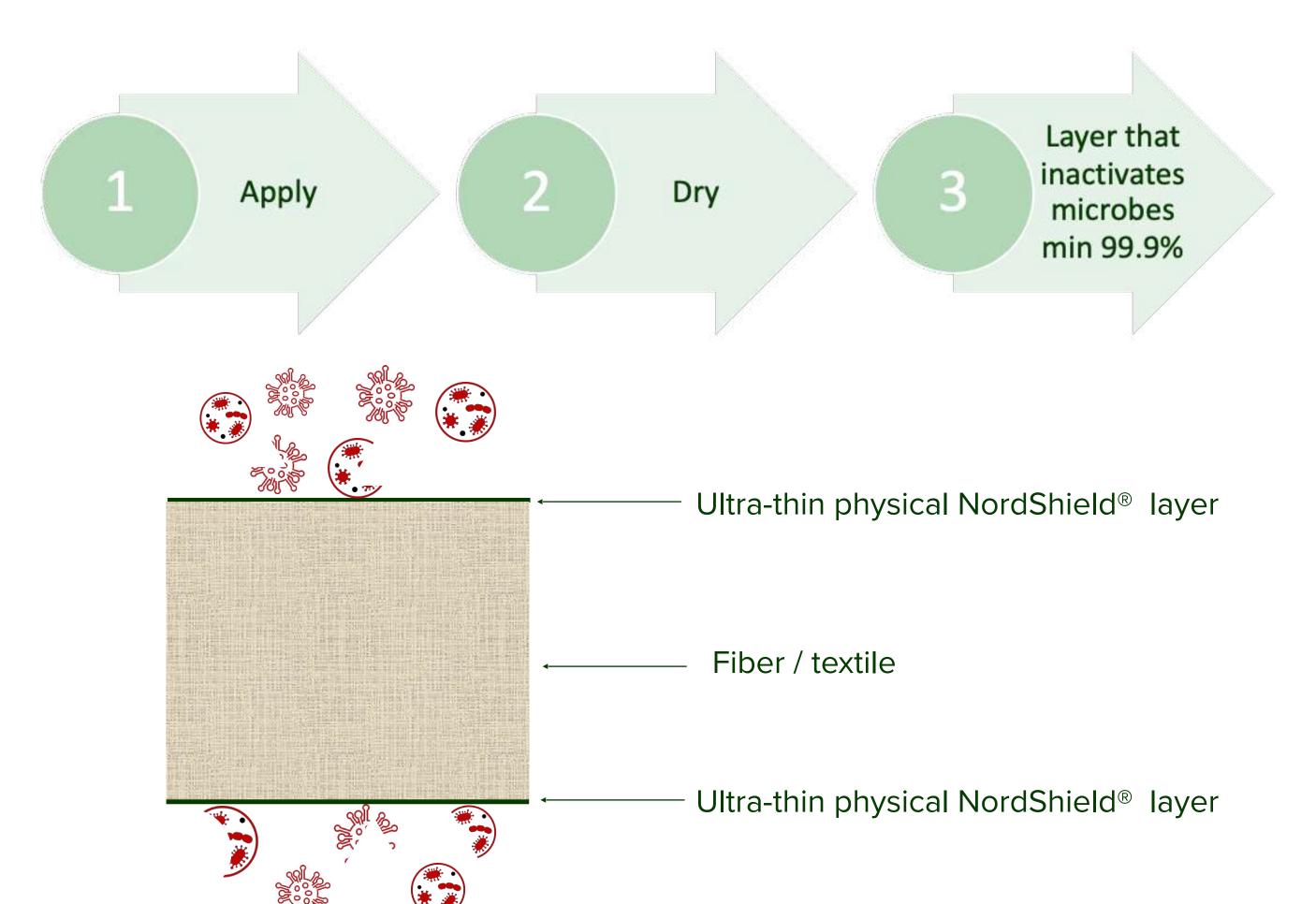
### A revolutionary, unique combination of naturality and power



NordShield® provides scalable, natural based antimicrobial technology that has the required efficacy for the market and is durable



# A physical, and yet invisible, armor to inactivate viruses and bacteria



- All qualities of the fabric incl. look, touch, feel, smell and colors remain the same
- The unique layer formation ensures seamless coverage of the fiber



### Durable protection in the textile & sports industries

#### NordShield® Fiber



#### NordShield® EcoLayr

Anti-mold treatment for transport and warehousing





#### NordShield® BioLayr

Non-biocide for consumer area:

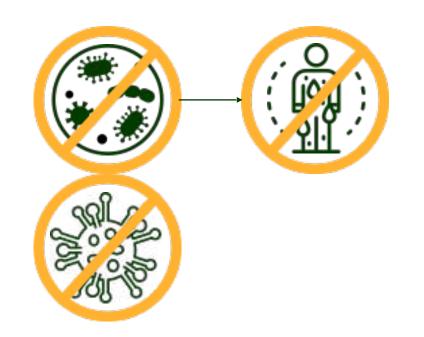
Durable antiviral and antibacterial treatment



#### NordShield® Pathogen Barrier (€

For medical area:

Durable pathogen barrier against viruses and bacteria, classified as medical device







# Antiviral and antibacterial disinfectants with long lasting NordShield® antimicrobial protection

#### NordShield® Brilliant series



**Brilliant Surfaces** 



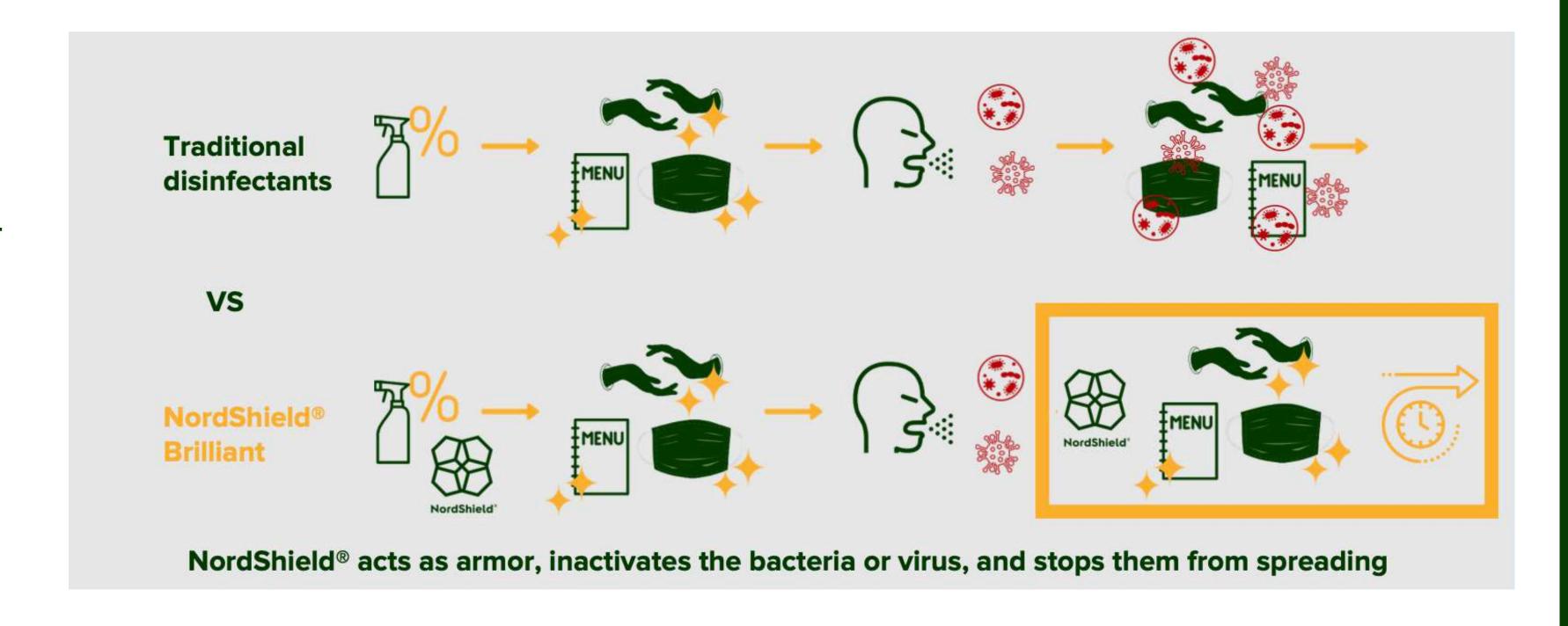
**Brilliant Mask Armor** 



**Brilliant Hands** 

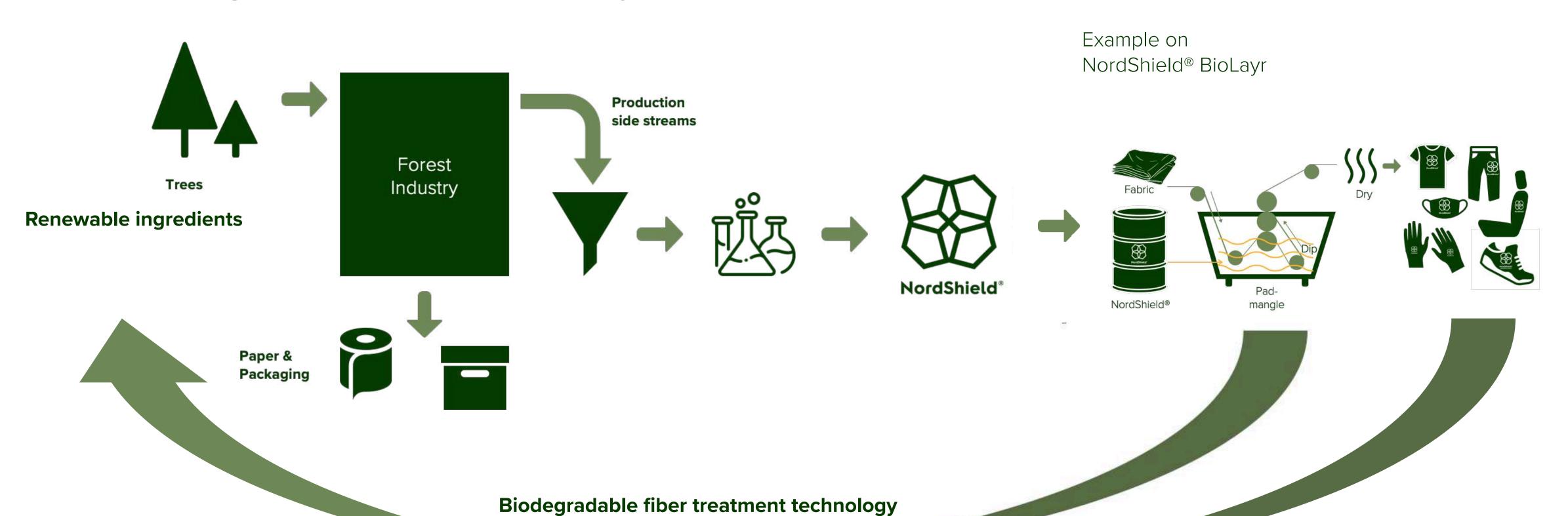


Brilliant Fresh





# NordShield® has a sustainable lifecycle, serving circular economy



**4**1



### **Summary:**

NordShield® has developed and commercialized a unique and irreplicable antimicrobial technology that solves a wide range of global environmental issues, with application areas that are nearly endless.

NordShield® offers worldwide unique, scalable, natural based antimicrobial protection.



Together with our partners and stakeholders, we want to create the best tomorrow.



# Bio-based solutions company cases

Pia Qvintus

Business Development Director

Spinnova - The Sustainable Fibre Company



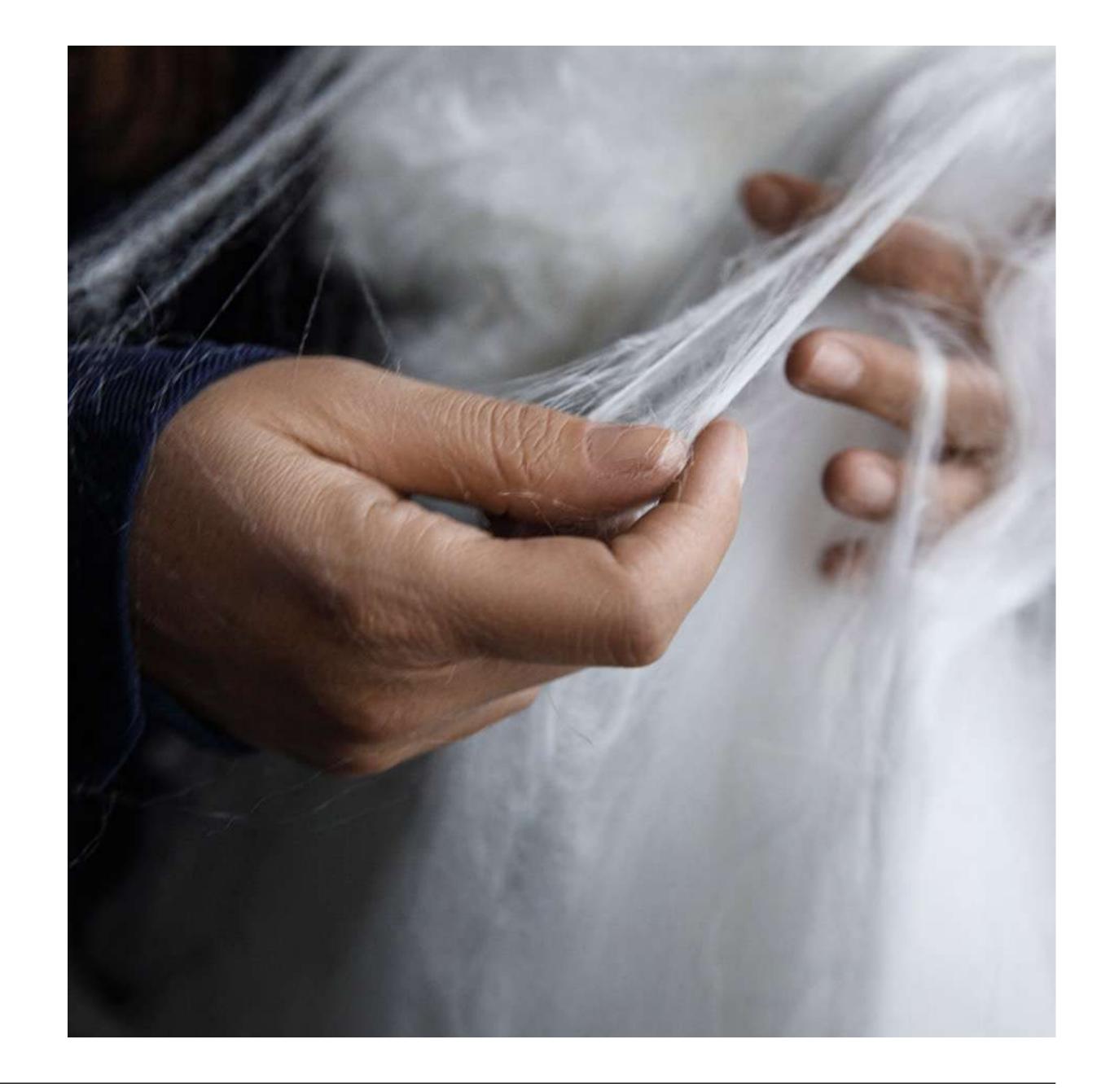
SPINNOVA®





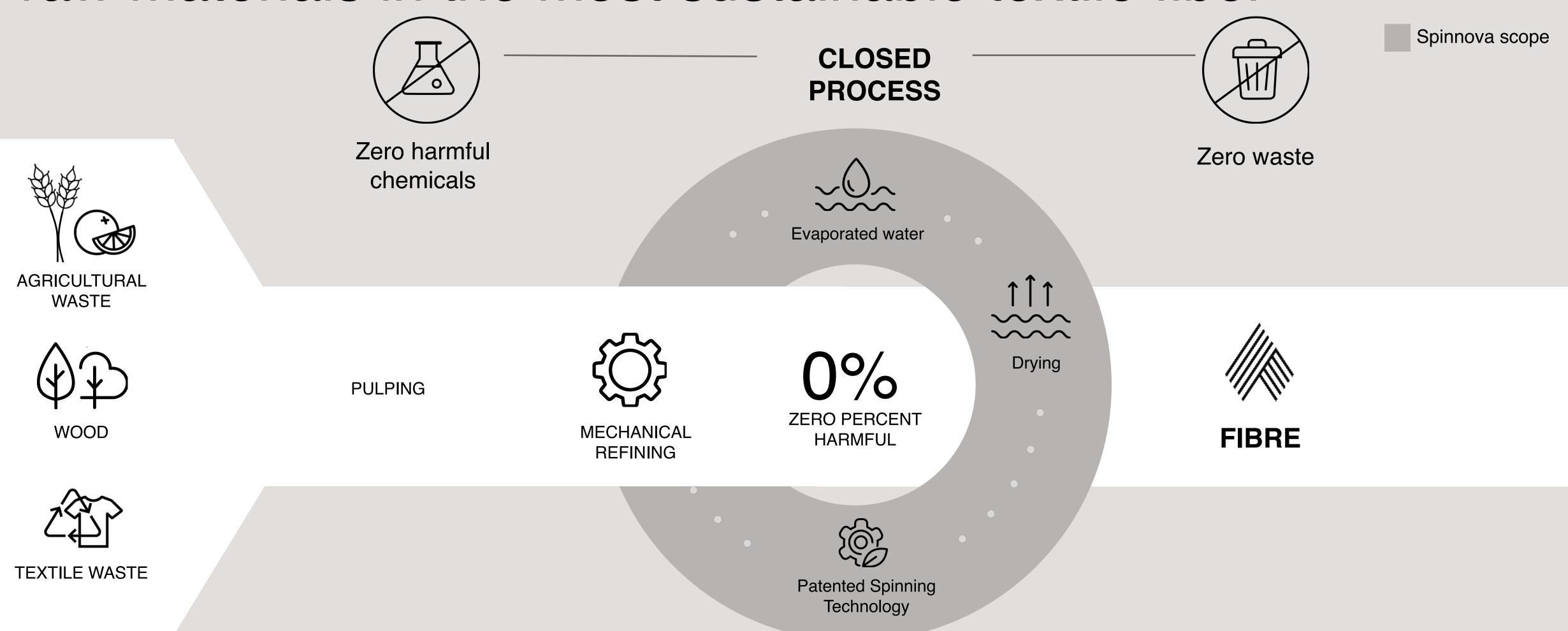
### OUR SOLUTION

A breakthrough technology for a new, environmentally friendly textile fibre made directly from wood pulp or side streams without **dissolving** and harmful **chemicals**.



46

# Spinnova is a technology platform that can convert many raw materials in the most sustainable textile fiber



# Key Technical Differentiators

### Spinnova



#### **Mechanical treatment**

Refining wood fibres into micro fibrils.

- Grinding pulp mechanically
- Feedstock is micro fibrillated cellulose
- Dry spinning and drying
- No dissolving or harmful chemicals
- No washes / rinses
- No side / waste streams

### Man-made Cellulosics

#### **Dissolving**



Chemically breaking wood fibres into cellulose polymers.

- Chemically dissolving wood fibres into a polymer solution
- Feedstock is dissolved pulp
- Wet spinning with harmful chemicals
- Several wash and rinse cycles
- Side and waste streams\*

<sup>\*</sup> Lyocell uses a complex chemical process, however in a closed cycle, so it's more sustainable than a viscose process.

# Our Sustainability Promise





BIODEGRADABLE

1006

At the end of its life, the Spinnova fibre can return to nature quickly. Taking just a few months to biodegrade in natural and marine environments, it has a fast end of life, leaving nothing harmful behind.

LESS WATER USE

OGO

To be exact, our water use is 99.5% less than cotton's over the entire lifecycle from farming to fibre process. While cotton plants rely on heavy watering, trees don't. No water is added during our process.

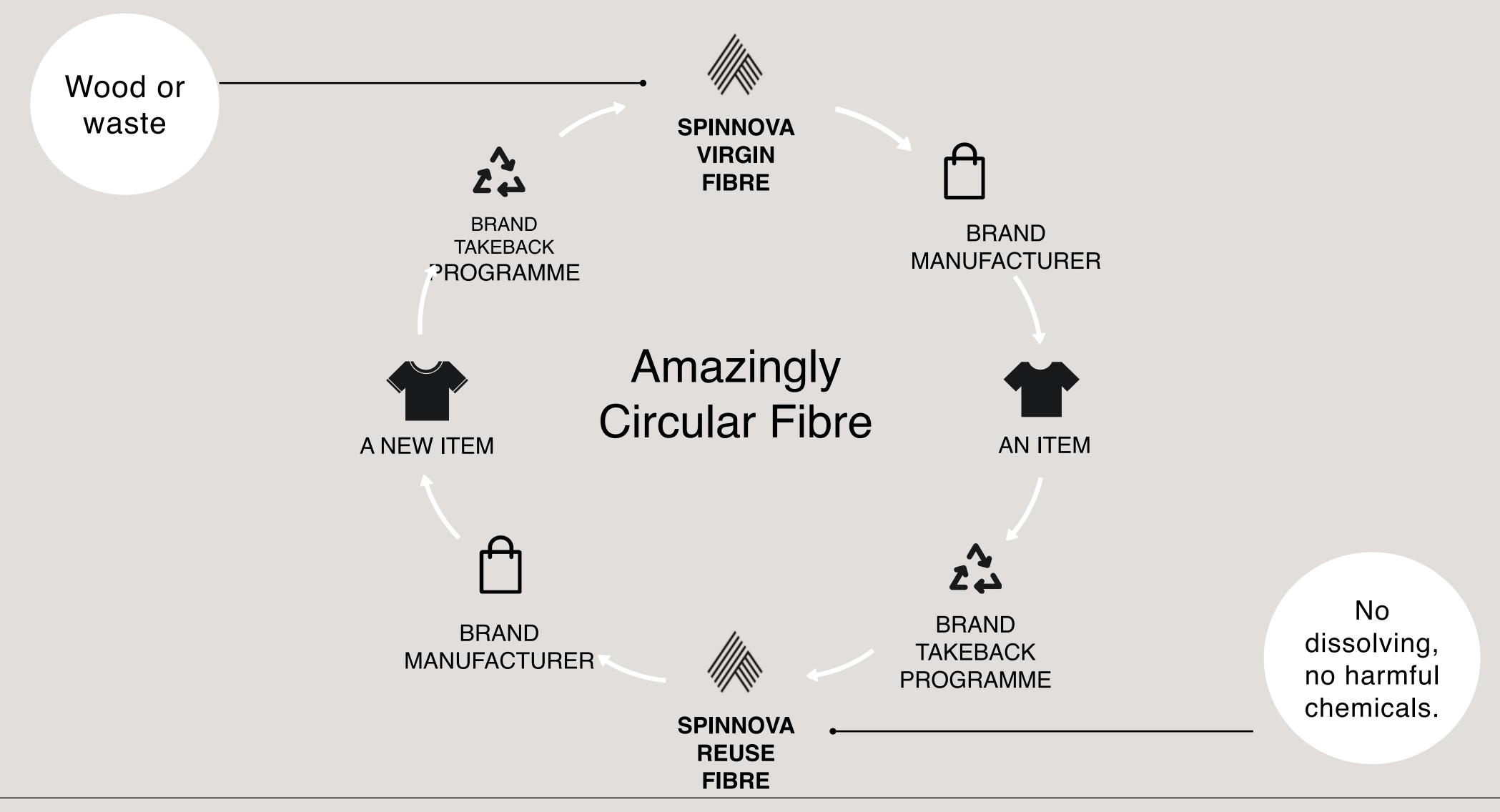
NO HARMFUL CHEMICALS

O
O
We are experts on how we can make material, such as pulp, behave as we want it to. This is how we have created a process, where wood fibre does not need dissolving with harmful chemicals. Instead, we refine it mechanically.



Another unique feature of the Spinnova fibre is that it can be upcycled in our process without losing quality or need to add virgin fibres. Always without using harmful chemicals. A whole new world of opportunity for real circularity, without sustainability shortcuts!

### Circular Ecosystem of the Future by Spinnova



## SPINNOVA TODAY

- Industrial pilot factory production in Finland
- 1st commercial mill in production in the end of 2022
- Wood-based kraft pulp first commercial raw material
- Waste stream based fibres also in R&D pipeline
- Commercializing with brands; e.g. Bestseller, Bergans, H&M and Marimekko
- Several demo product launches coming in the near future





# Circular Events 2021 Kickoff

BUSINESS FINLAND







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- Nordic perspective on circular economy
   Cathrine Barth, Circularities
- Circular industrial locomotives
  Susanne M. Nævermo-Sand, Celsa Nordic
- Visual intelligence as fuel for circular innovation
   Hanne Wetland, Knowit
- Panel discussion
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   (Knowit) and Marthe Haugland (Nordic Innovation)
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- Q&A dialogue with the audience



Onboarding April 2021



Pre-launching June 2021



# Nordic perspective on circular economy

Cathrine Barth
Founder & Circular Strategist
Circularities







# Circular industral locomotives

Sustainability & Communication Manager
Celsa Nordic









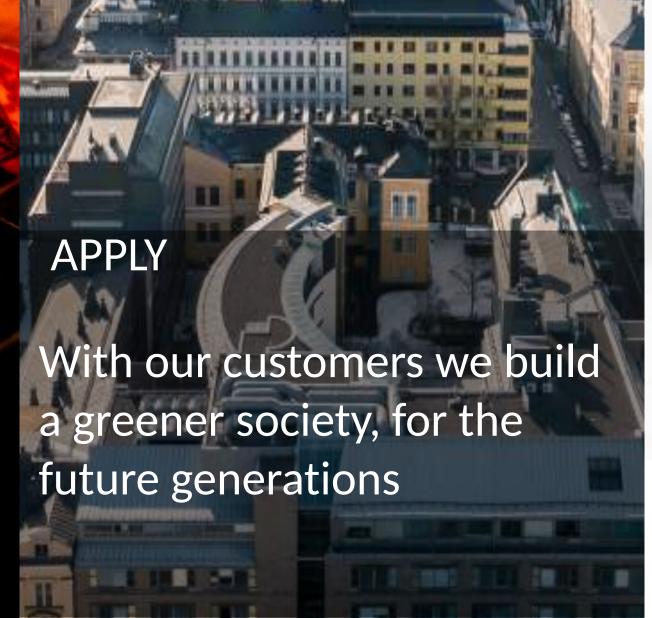
### OUR VALUE CHAIN IS BASED ON THE CIRCULAR ECONOMIC PRINCIPLES



Europe's cleanest manufacturing process and get a new life as climate-smart reinforcing steel

**PRODUCE** 

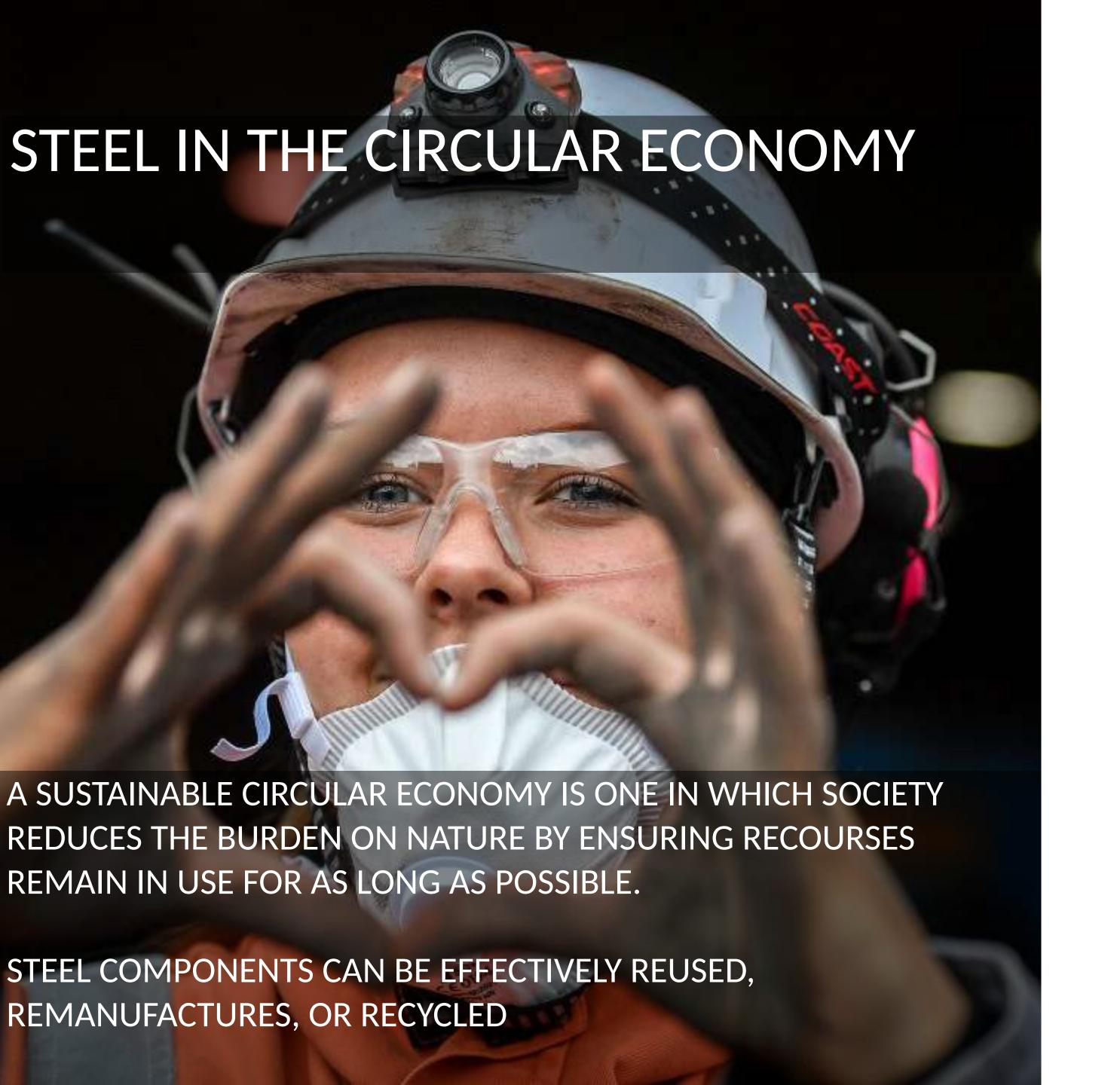
Nordic sustainability. Renewable reinforcing steel manufactured with hydropower and passion

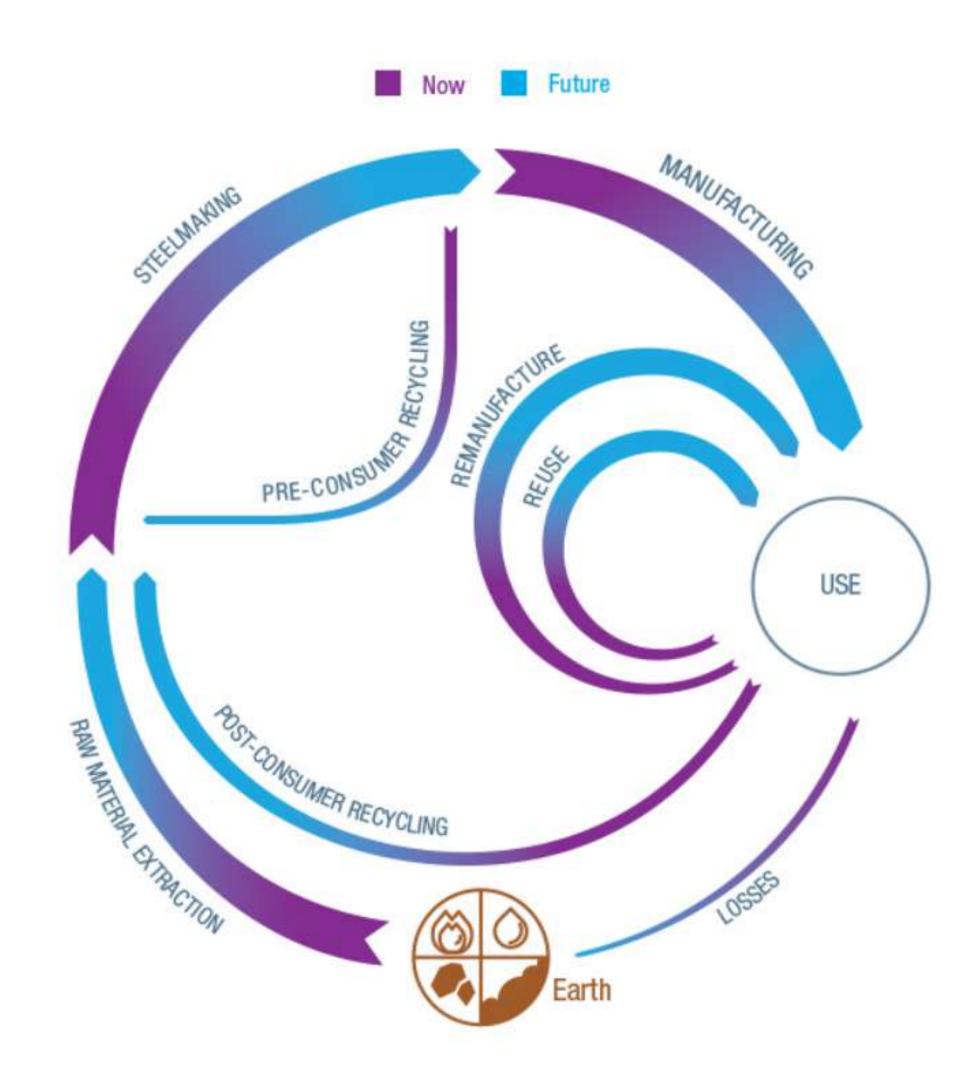




**RECYCLE** 

Steel is 100% recyclable. Recycled steel maintains the inherent properties of the original steel.





BY KNOWING THE ACTUAL
IMPACT OF EACH STAGE OF A
PRODUCT'S LIFE,
WE CAN MAKE THE BEST
DECISIONS ON WHAT
MATERIALS WE SHOULD USE.

We are no better than the weakest link







# Visual intelligence as fuel for circular innovation

Hanne Wetland
Business Designer
Knowit



knowit

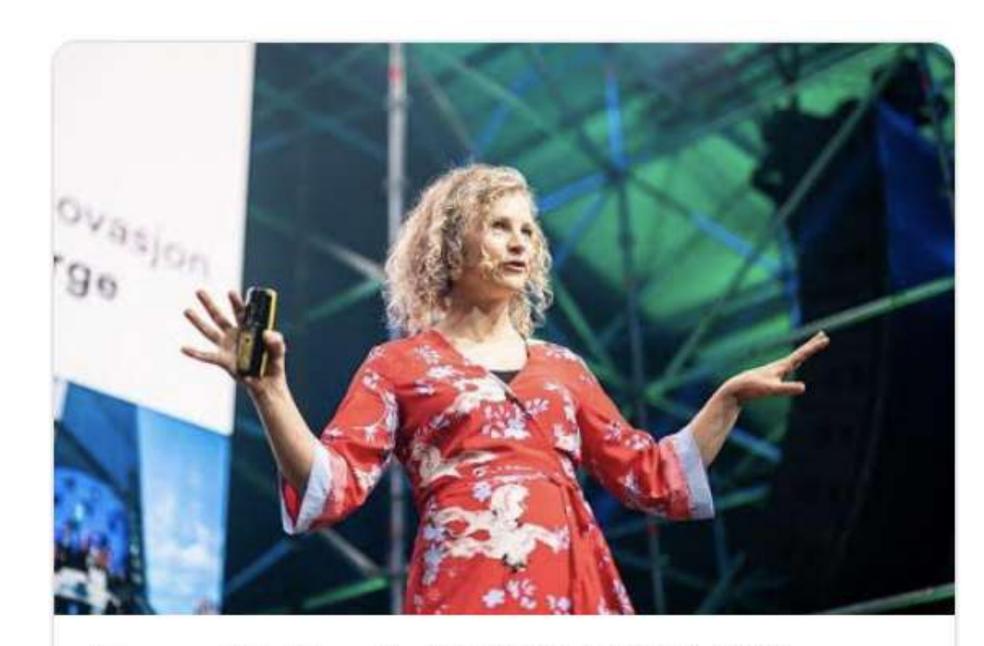


# Visual intelligence as fuel for circular innovation

@hannewetland

#### knowit

## Innovation nerd and facilitator

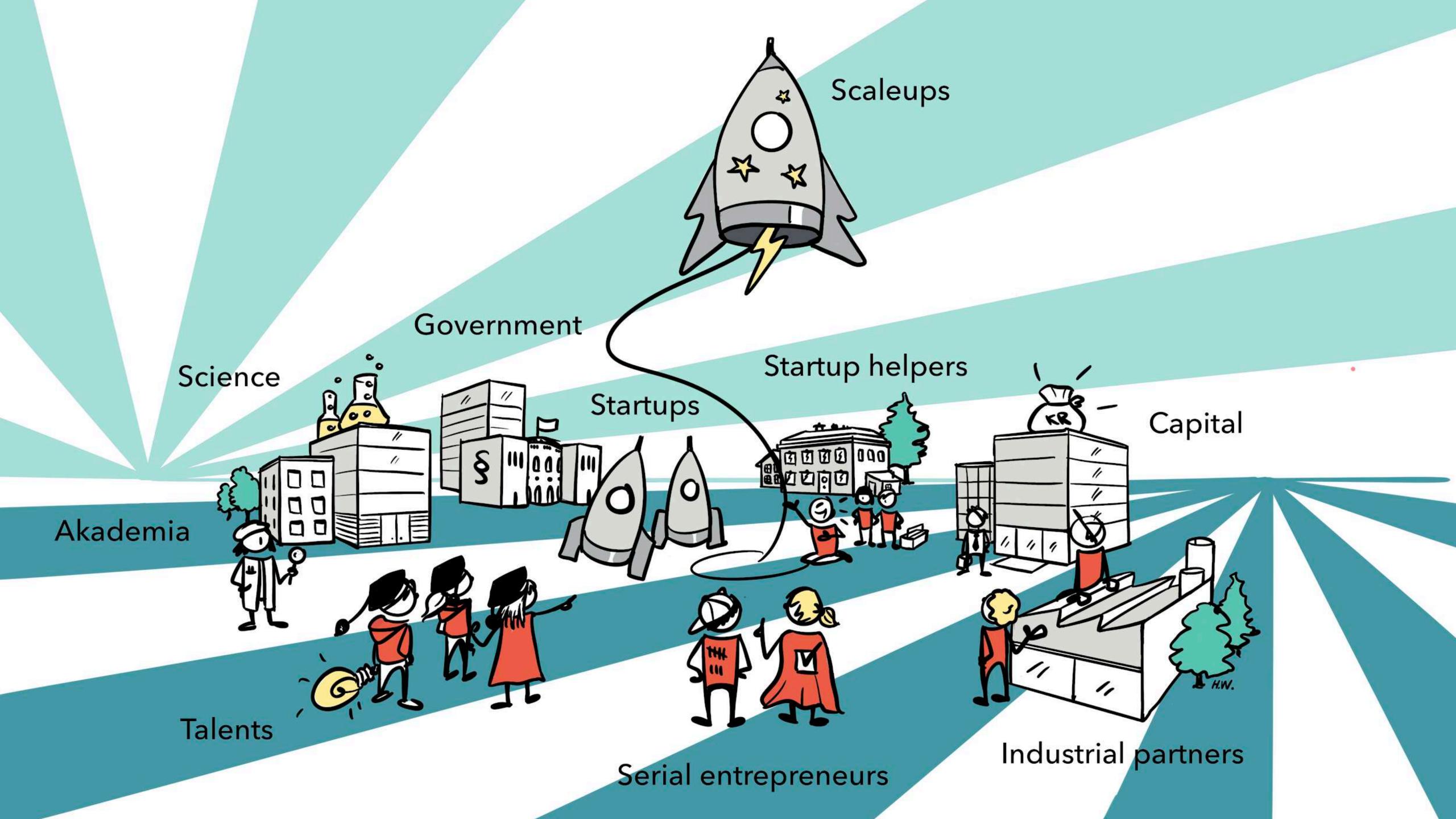


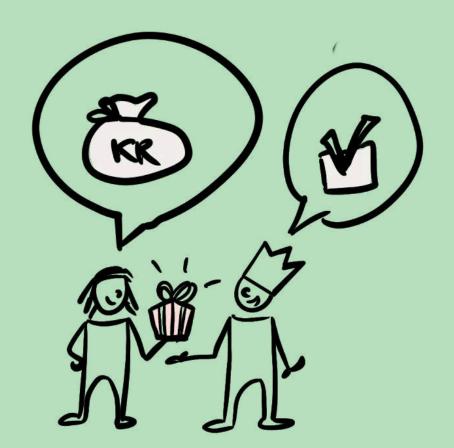
# Hanne Wetland – LEARN FROM 500 INNOVATION PROJECTS

YouTube

Want to see more and join us at next years conference? Get your tickets at y-oslo.co...







The innovation methodes we use are made for a <u>linear</u> economy.

#### knowit

# Customer is king

Growth hacking

Customer journeys

Jobs-to-be-done

Lean innovation

problem-solution-fit

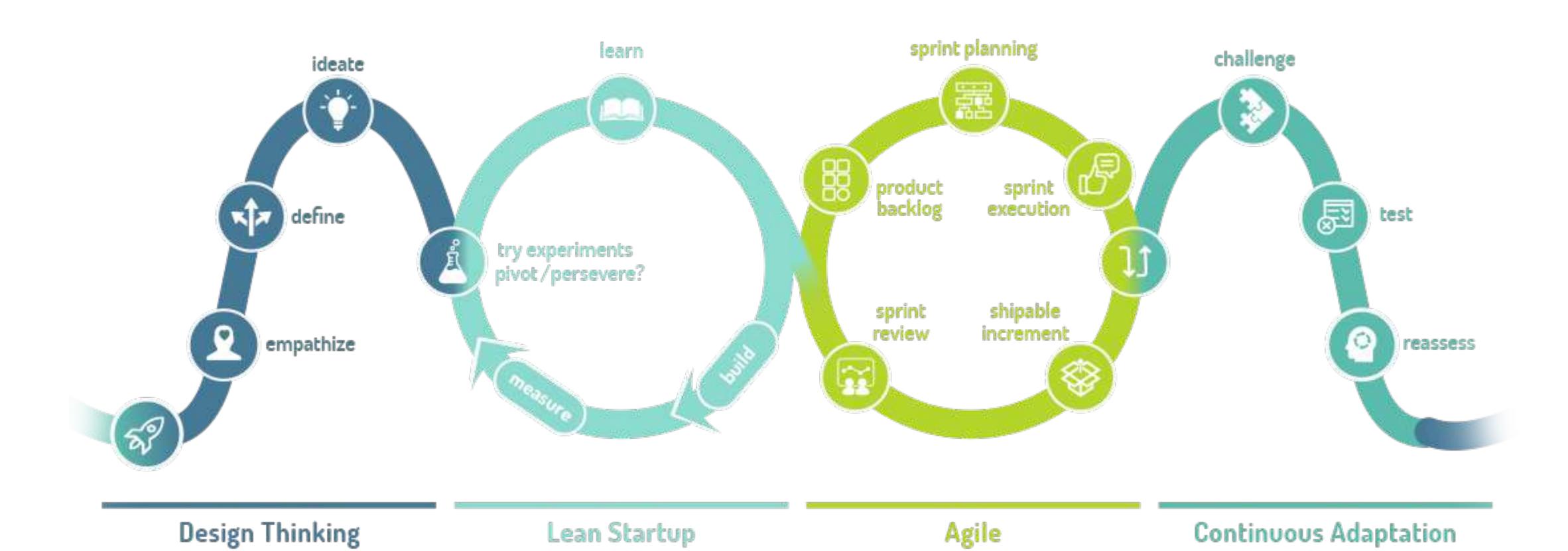
Potential market

Early adoptors

Innovation accounting

product-market-fit

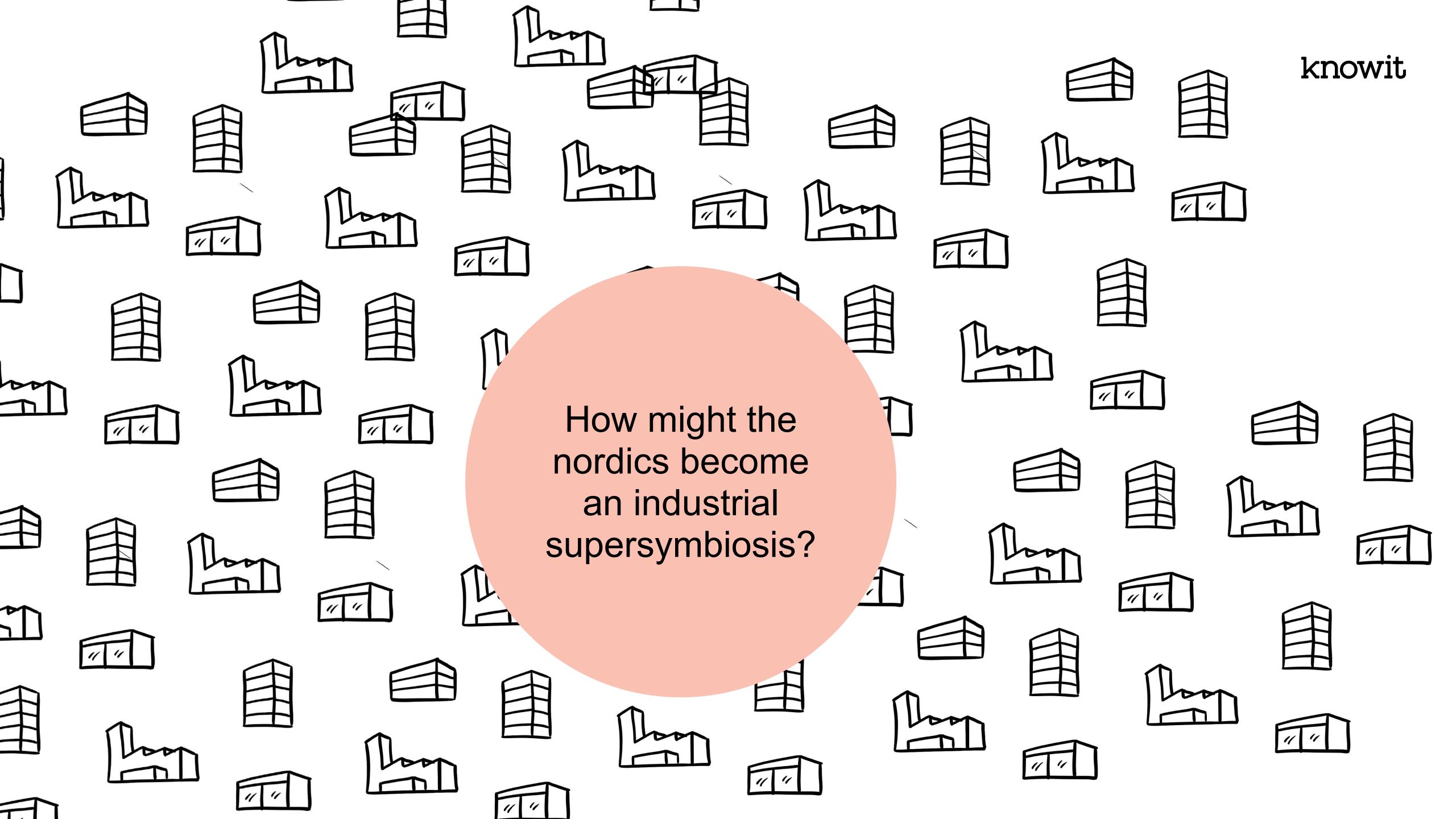
### l.e.



knowit

# We need other innovation methodes for a <u>circular</u> economy

Systems are super.



# Key question for innovation

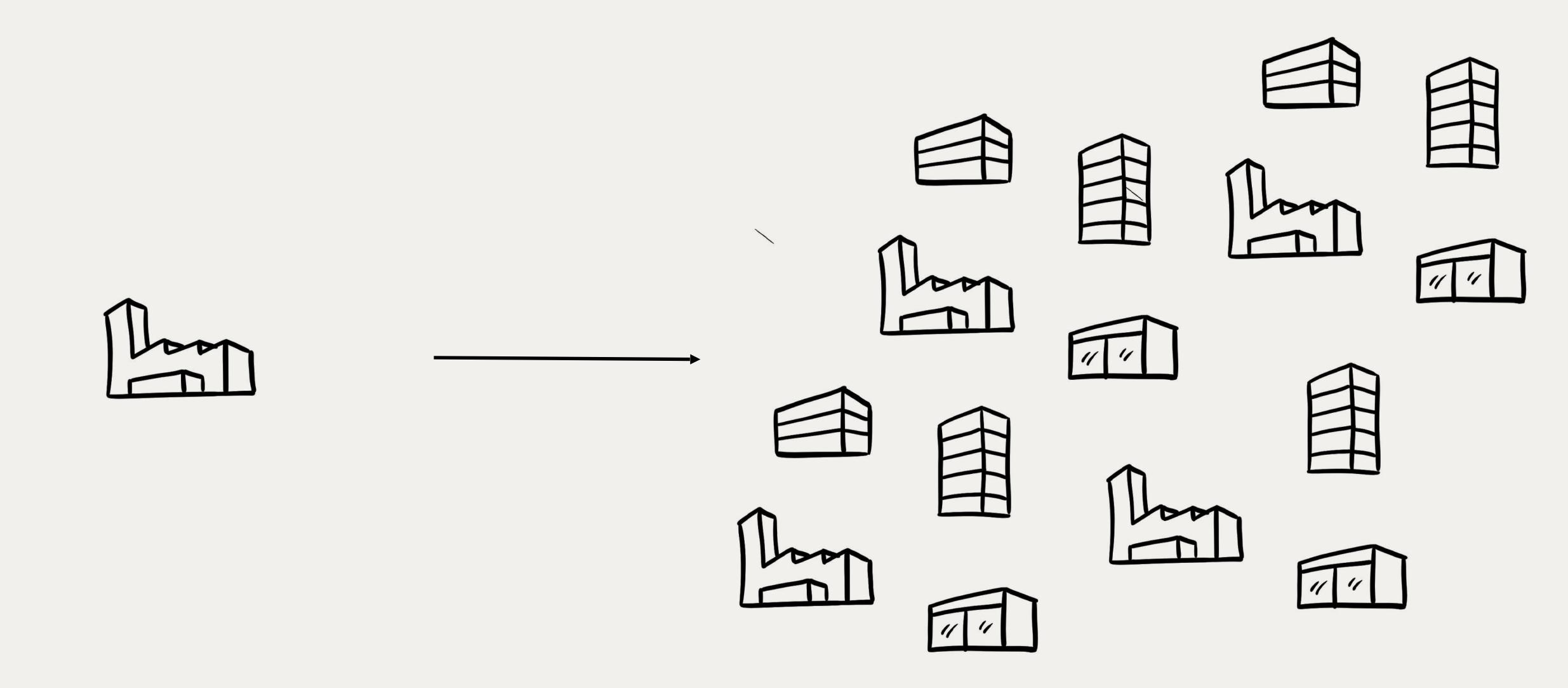
From:

How do you solve your customers problems?

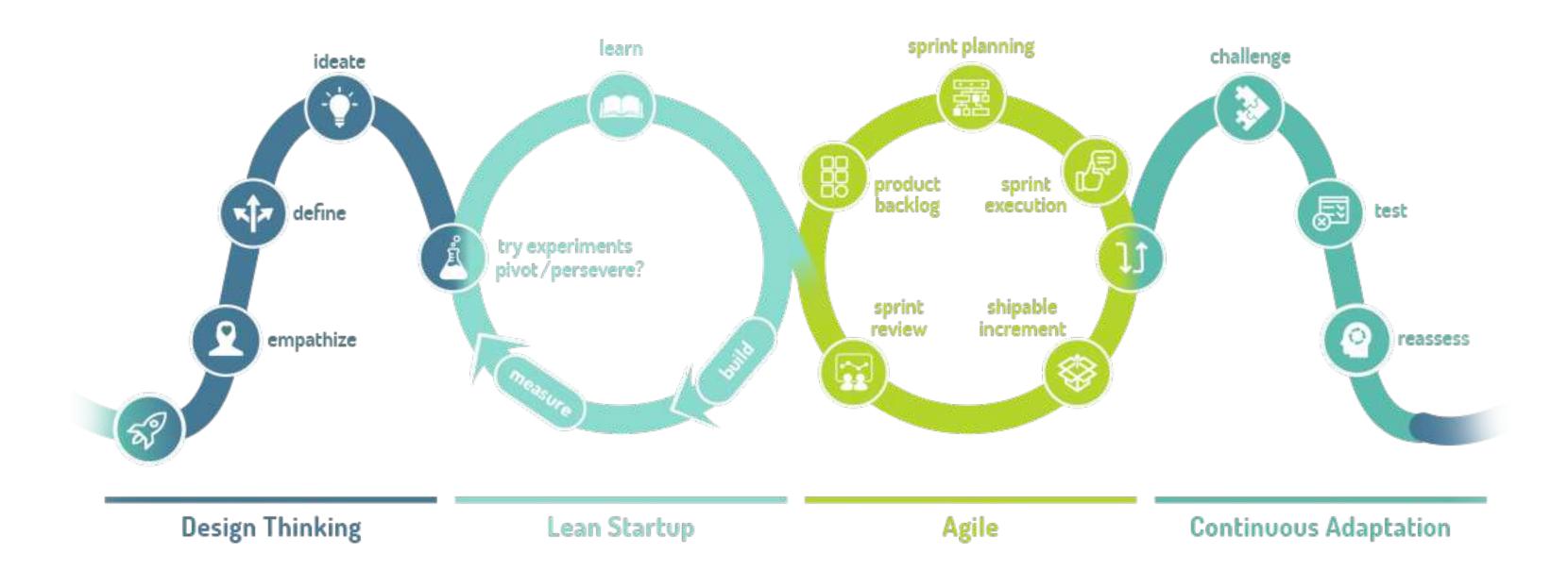
To:

How do you make a circular system better?

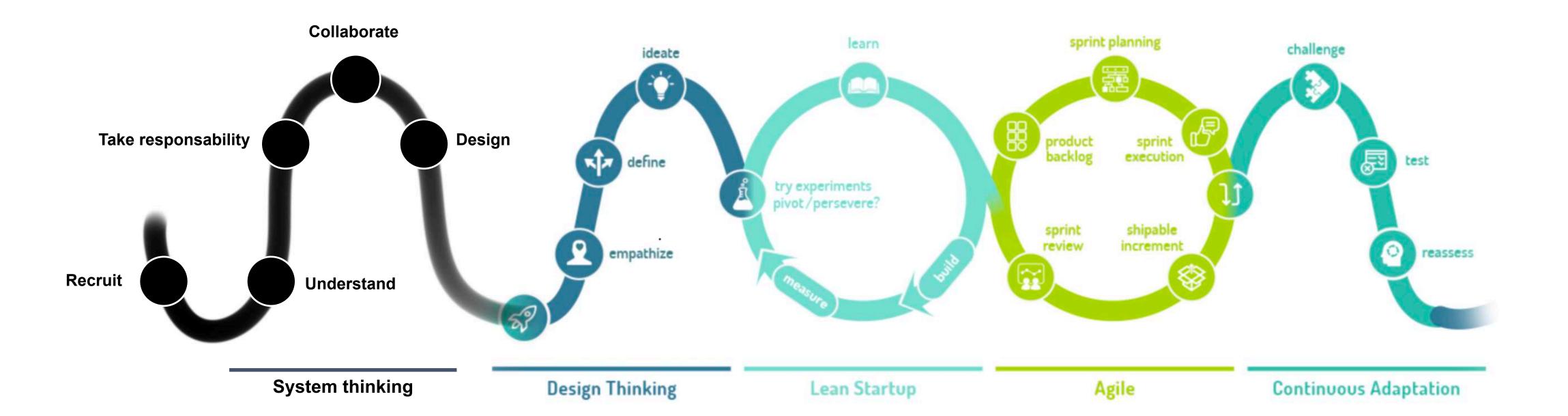
# We are used to do innovation inside of organisations



# From this

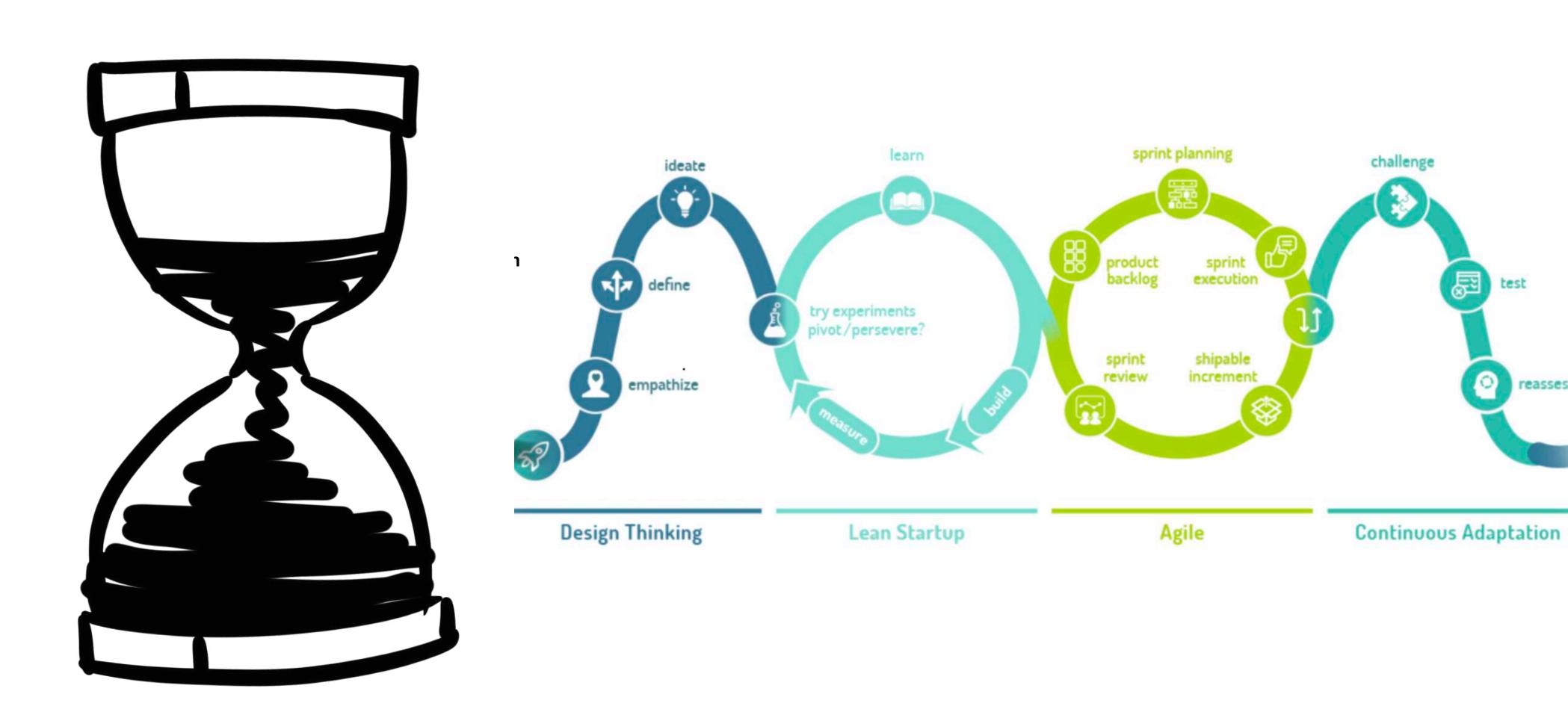


# To this

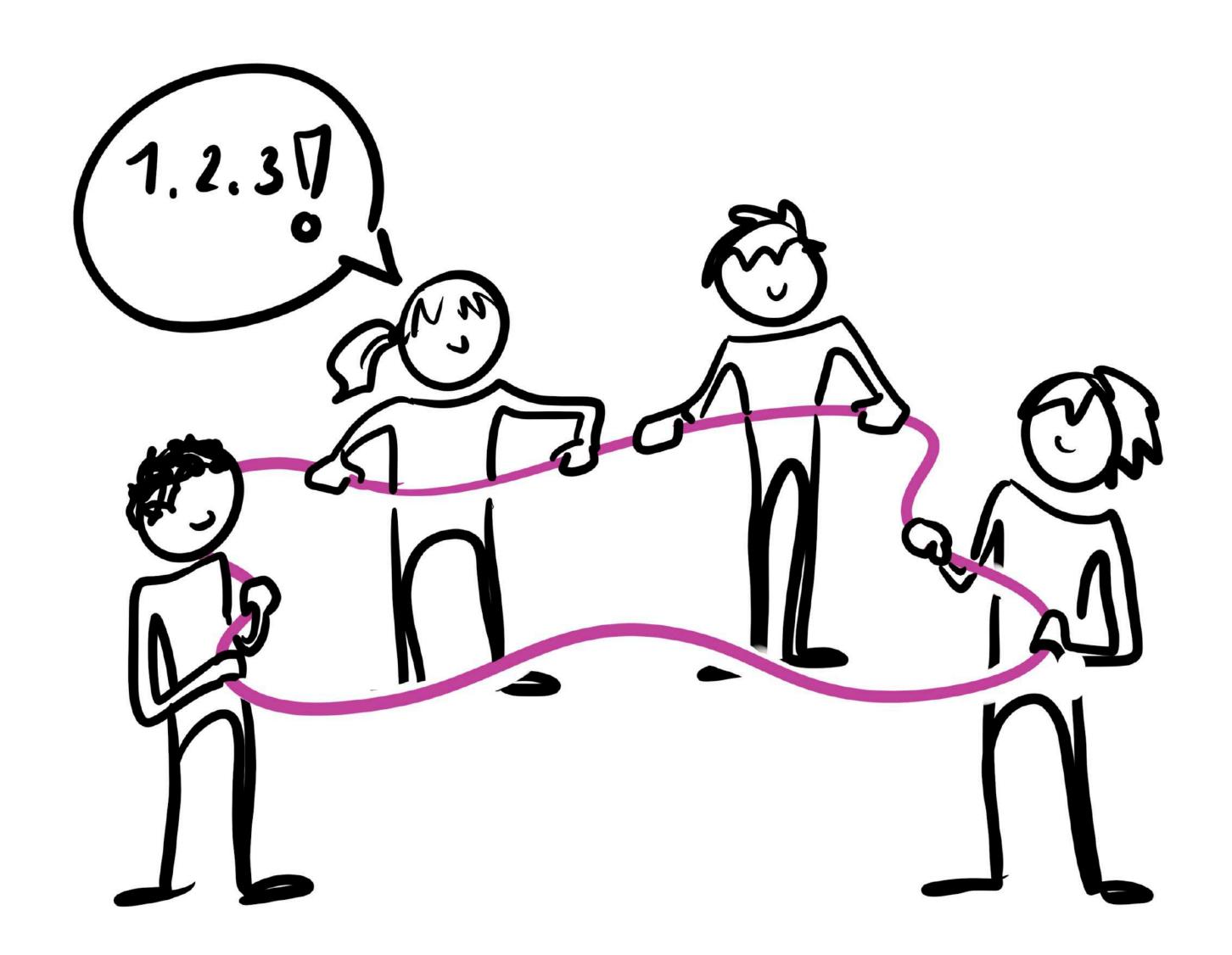


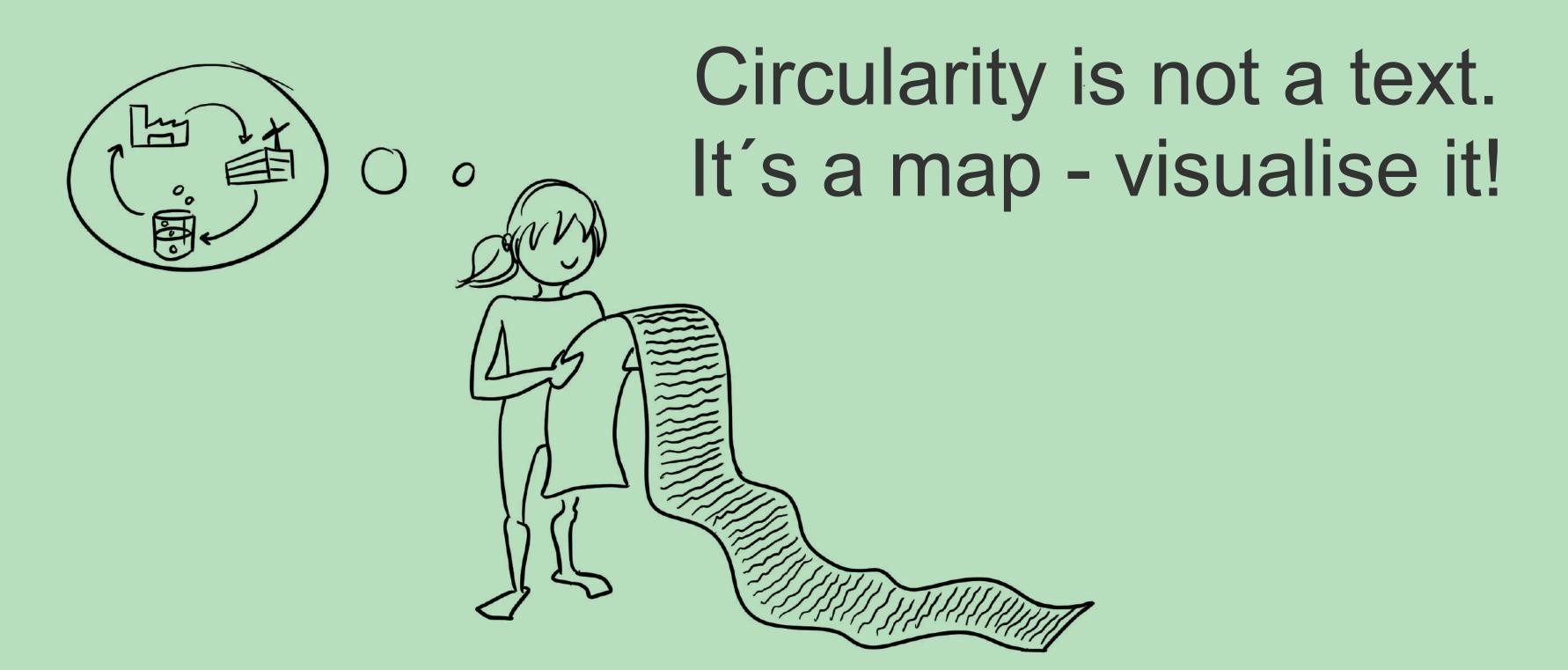
reassess

# To this

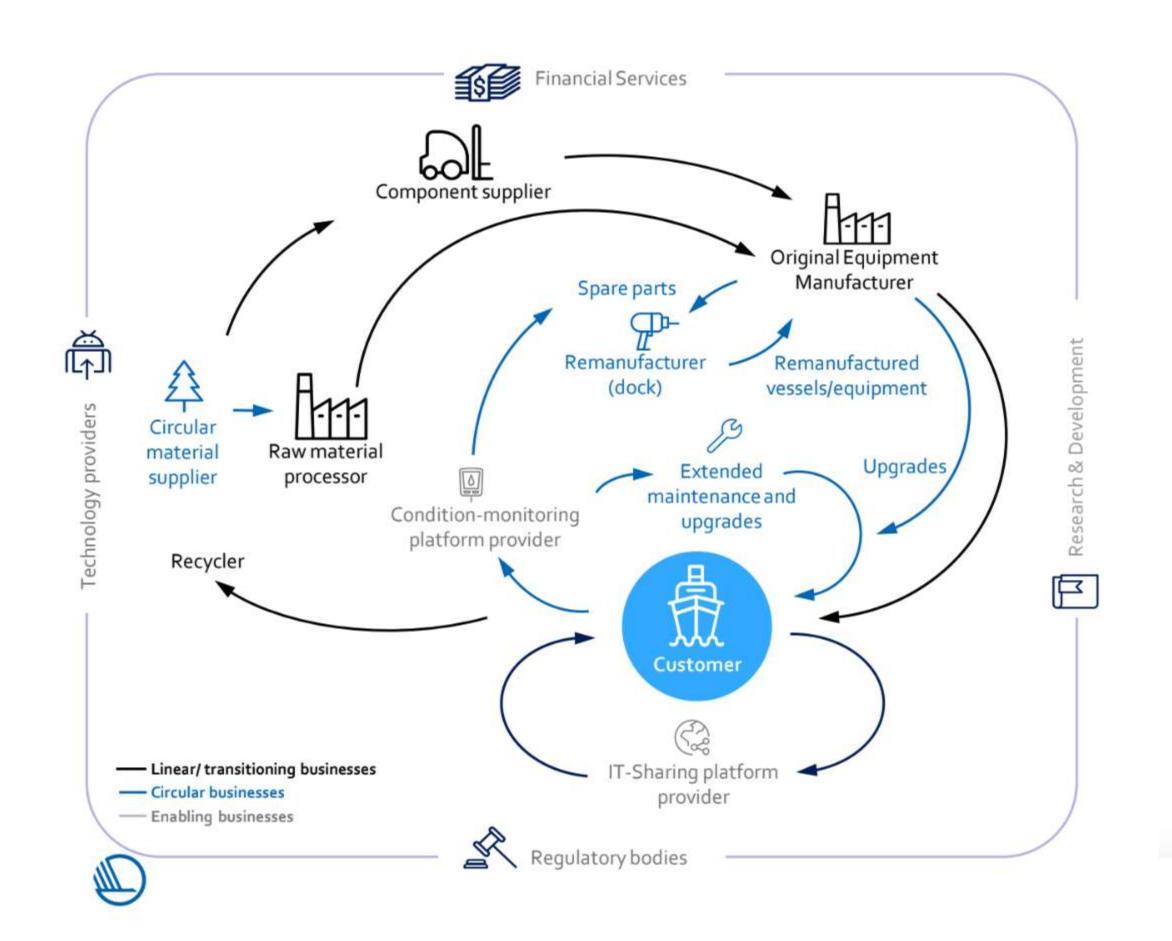


## We must all act at the same time



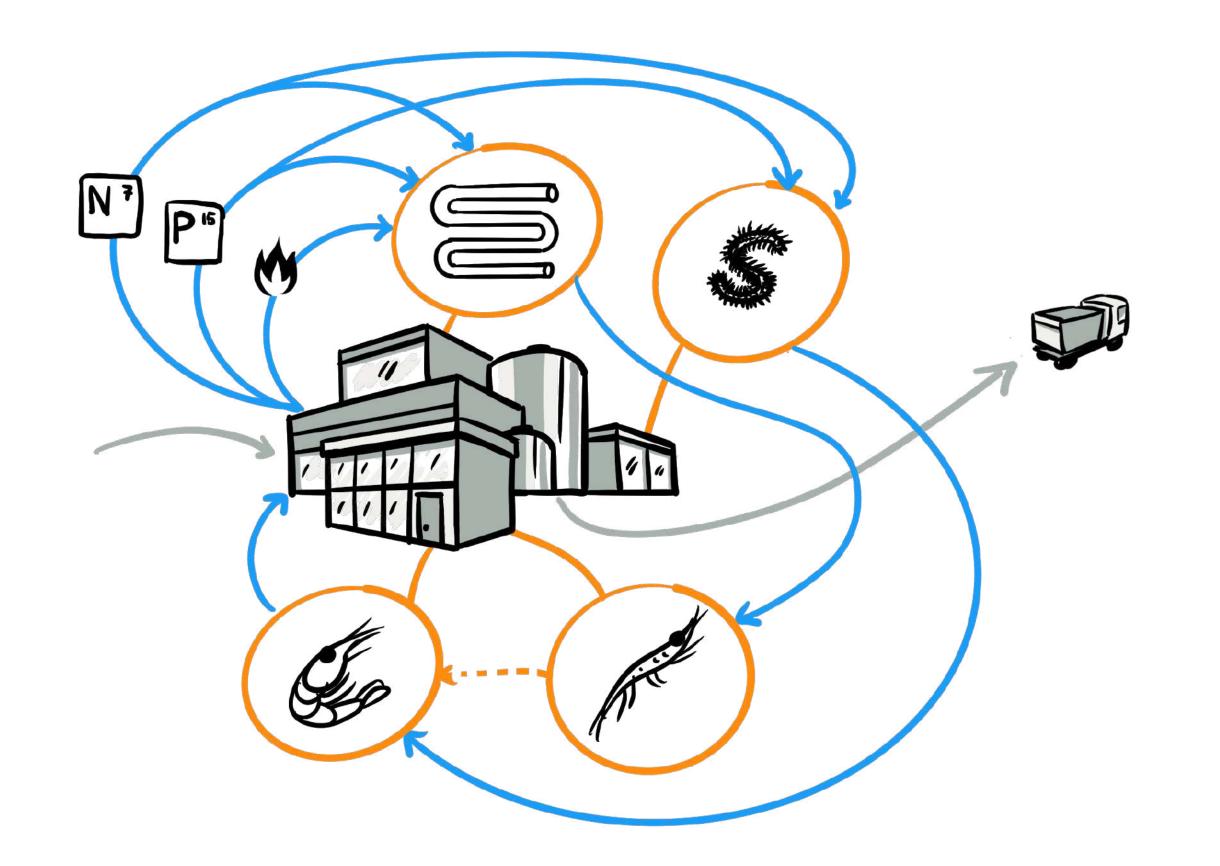


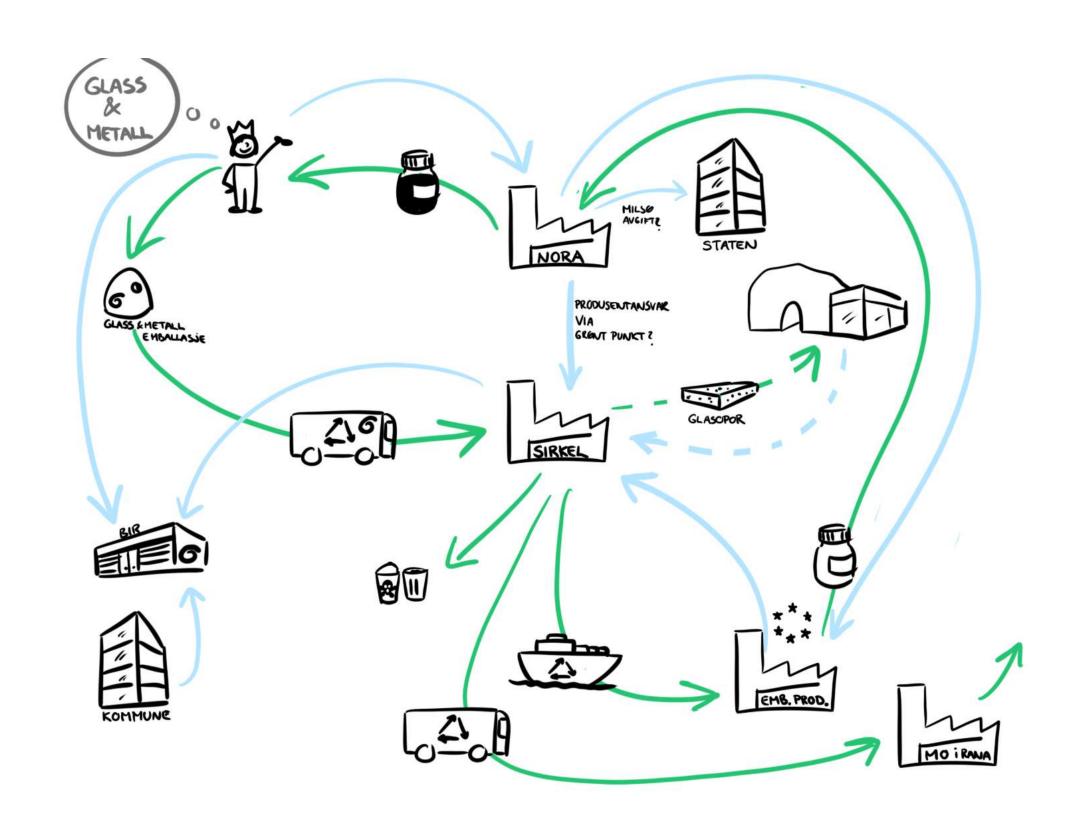
## We should all be able to work like this





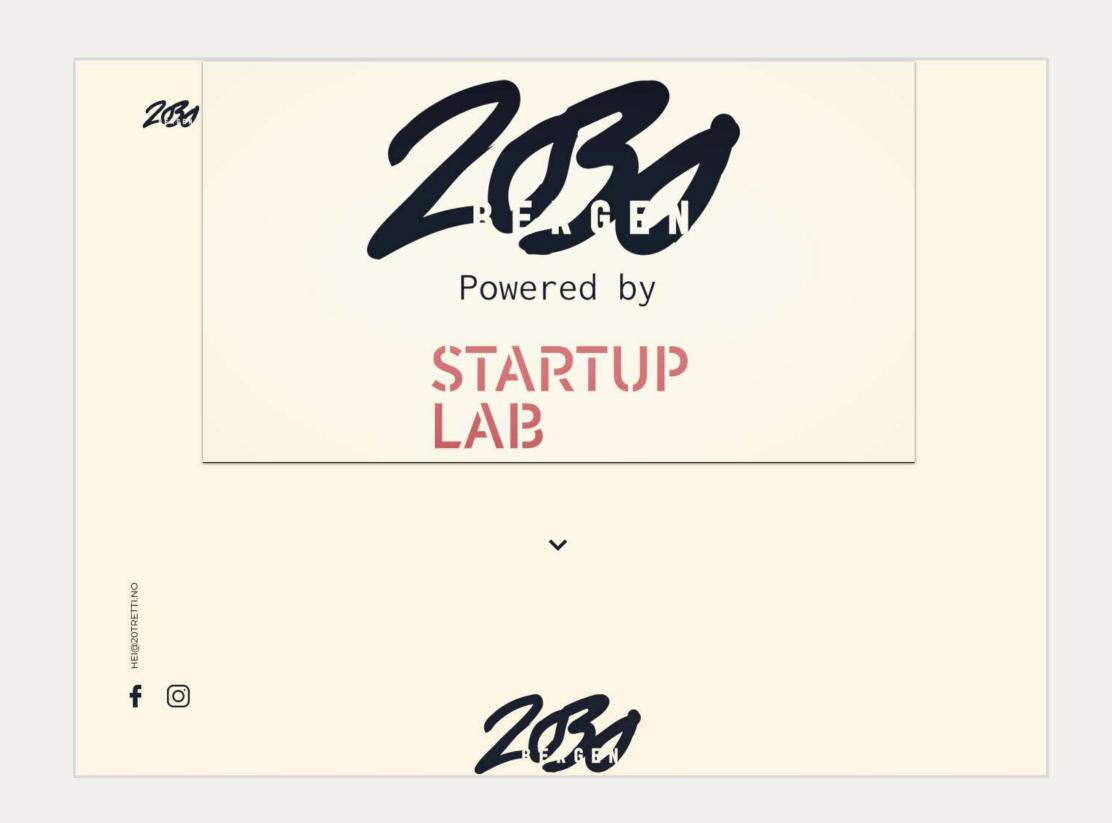
# Or this

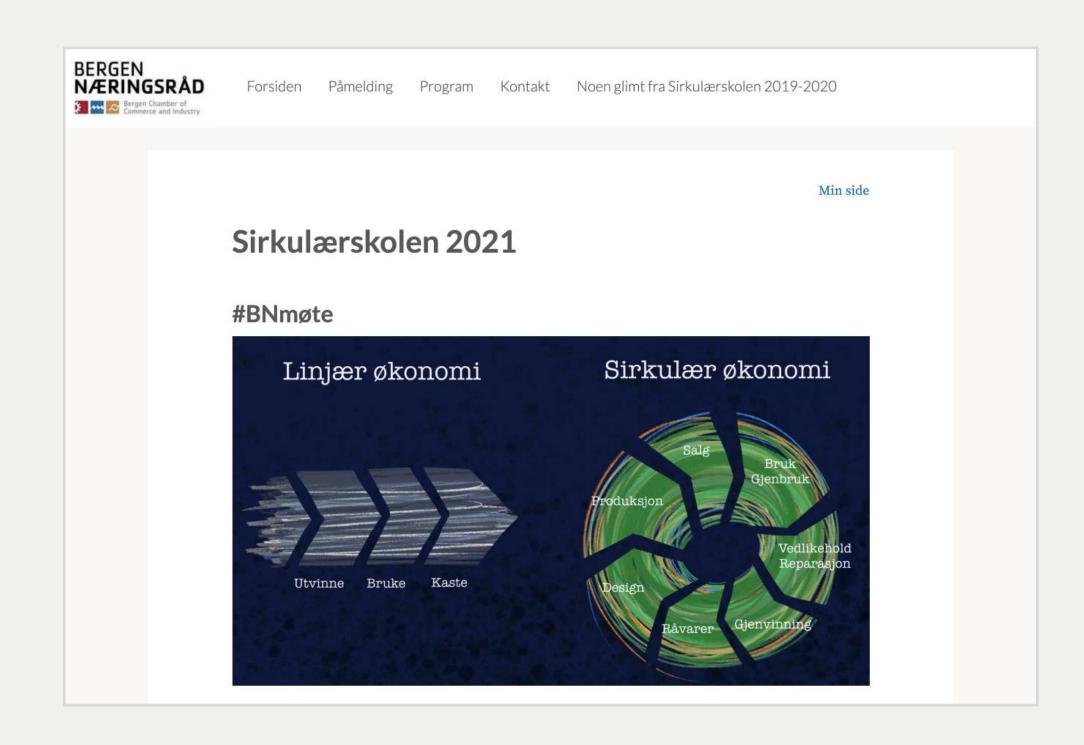




Five system perspectives

# Currently applied in two circular innovation programs





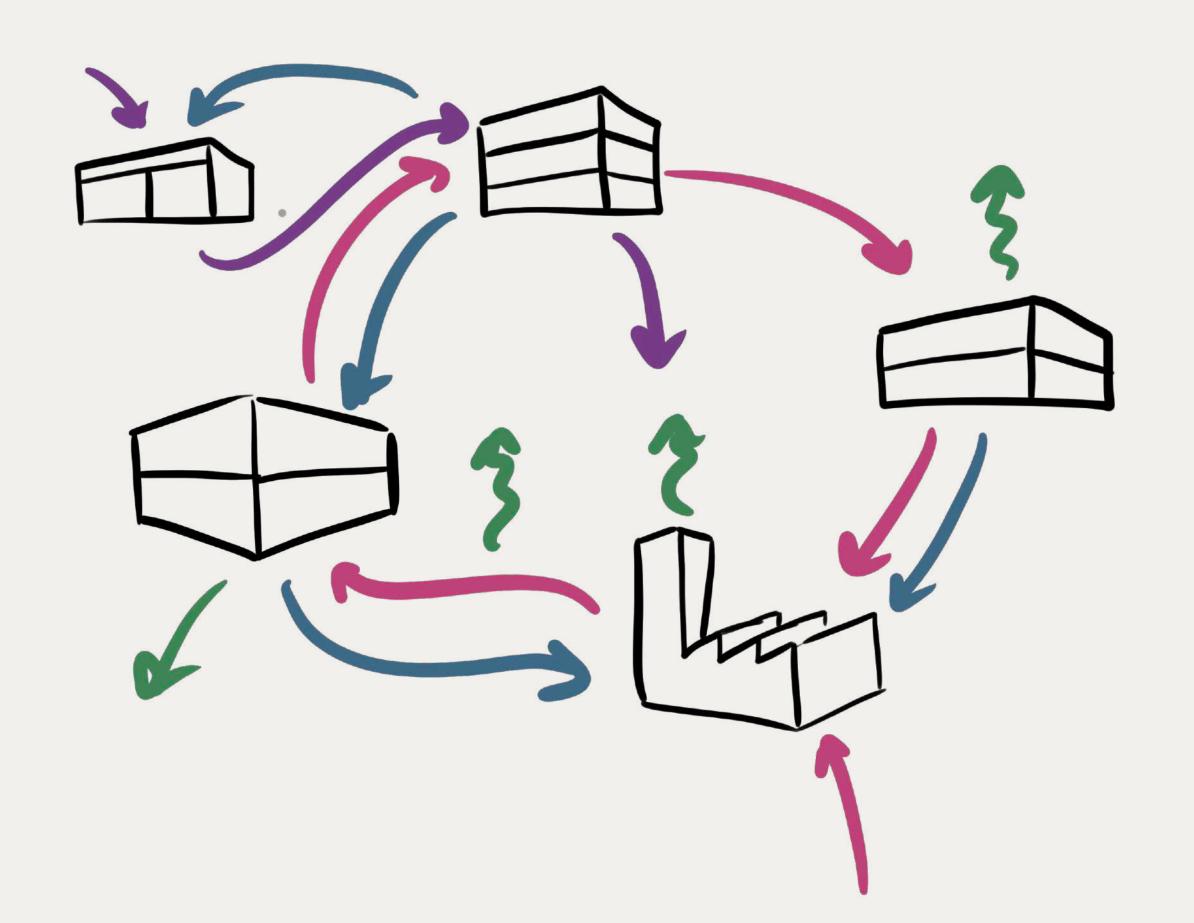
#### > Value circles

#### Goal

Give everyone acces to understanding and mapping out the tangible and intangible circular flows within a system. Making sure we all se the same picture.

#### I.e.

How food, lawn movers or other resources flow through society.



# Every resource has its color

- 1. Black: emissions
- 2. Grey: Pollutants and mixed waste
- 3. Orange: Product
- 4. Light green: material 1
- 5. Dark green: material 2
- 6. Light blue: Energy
- 7. Dark blue: Money
- 8. Purple: data

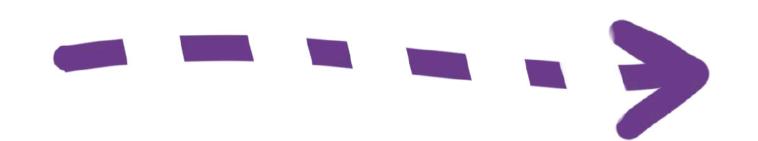
# The meaning of arrows



Colour = type of resource



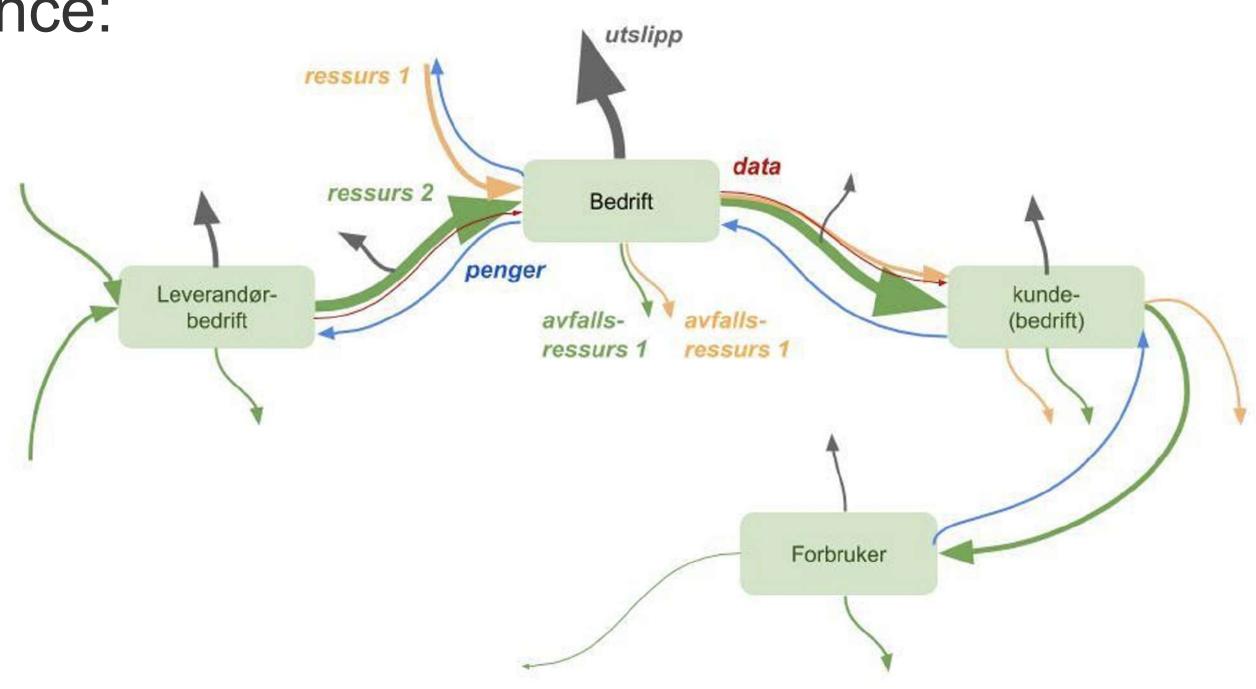
Density = amount/value

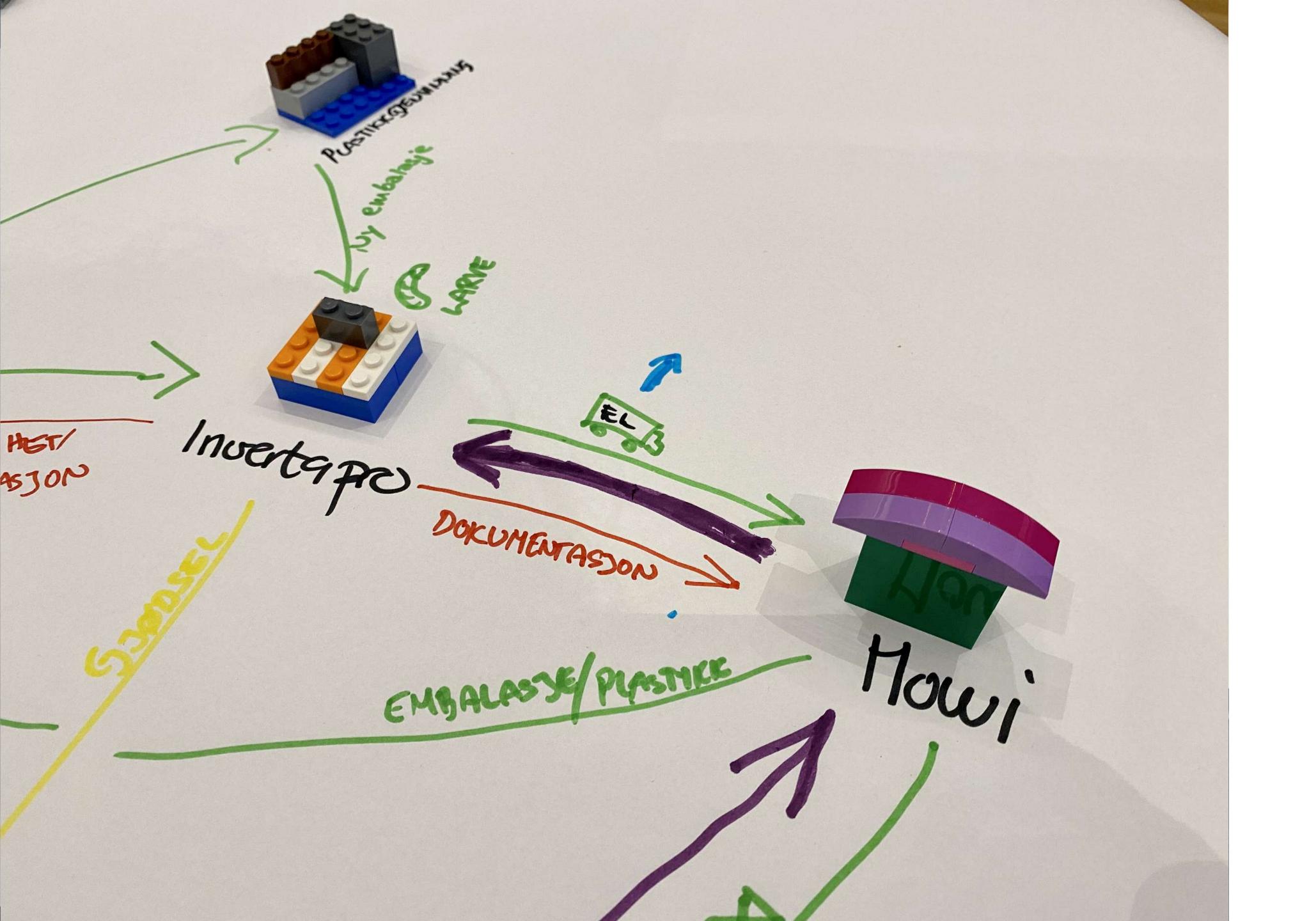


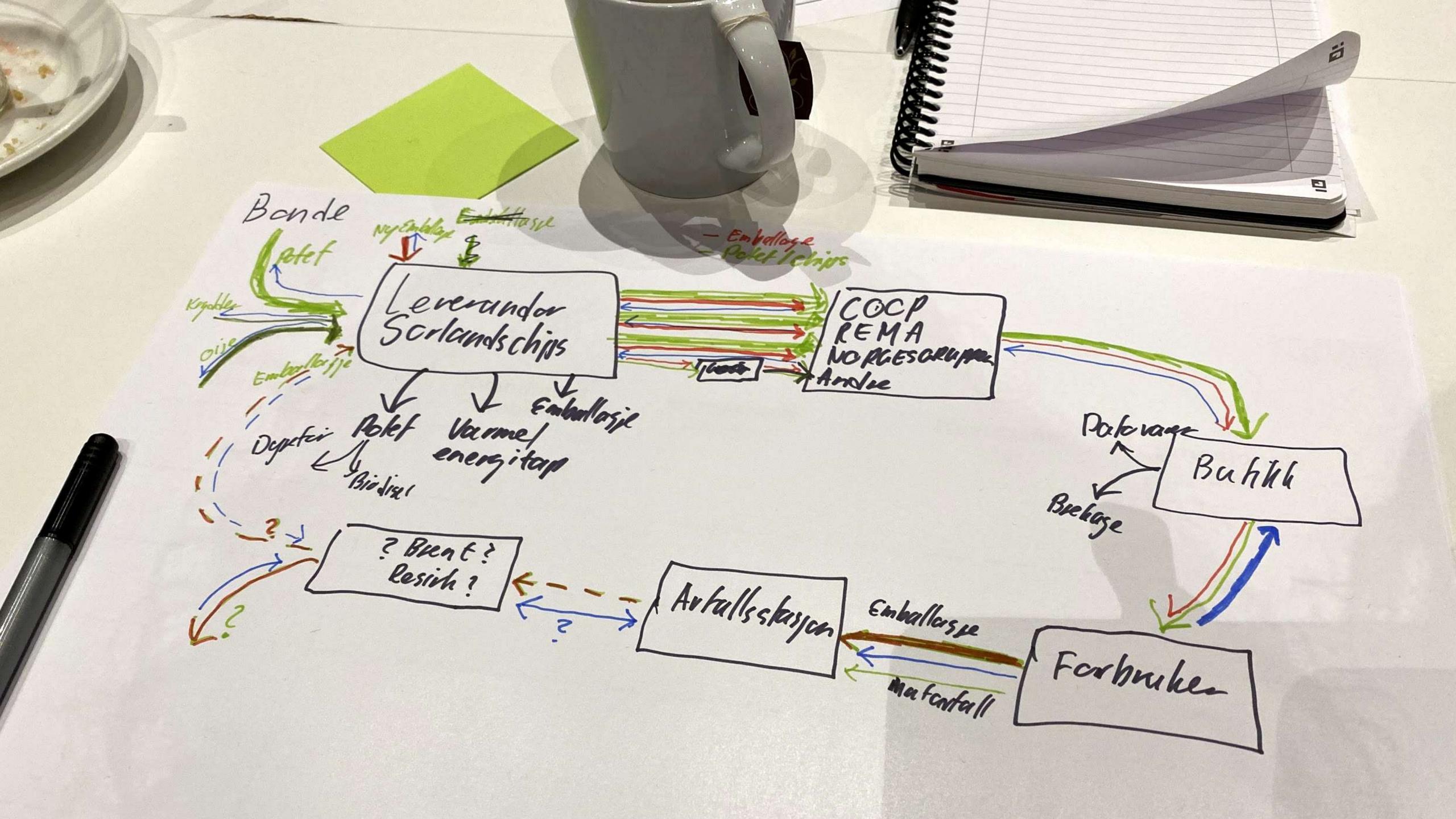
Stripe = Velocity/scarcity/existence

# Recipie

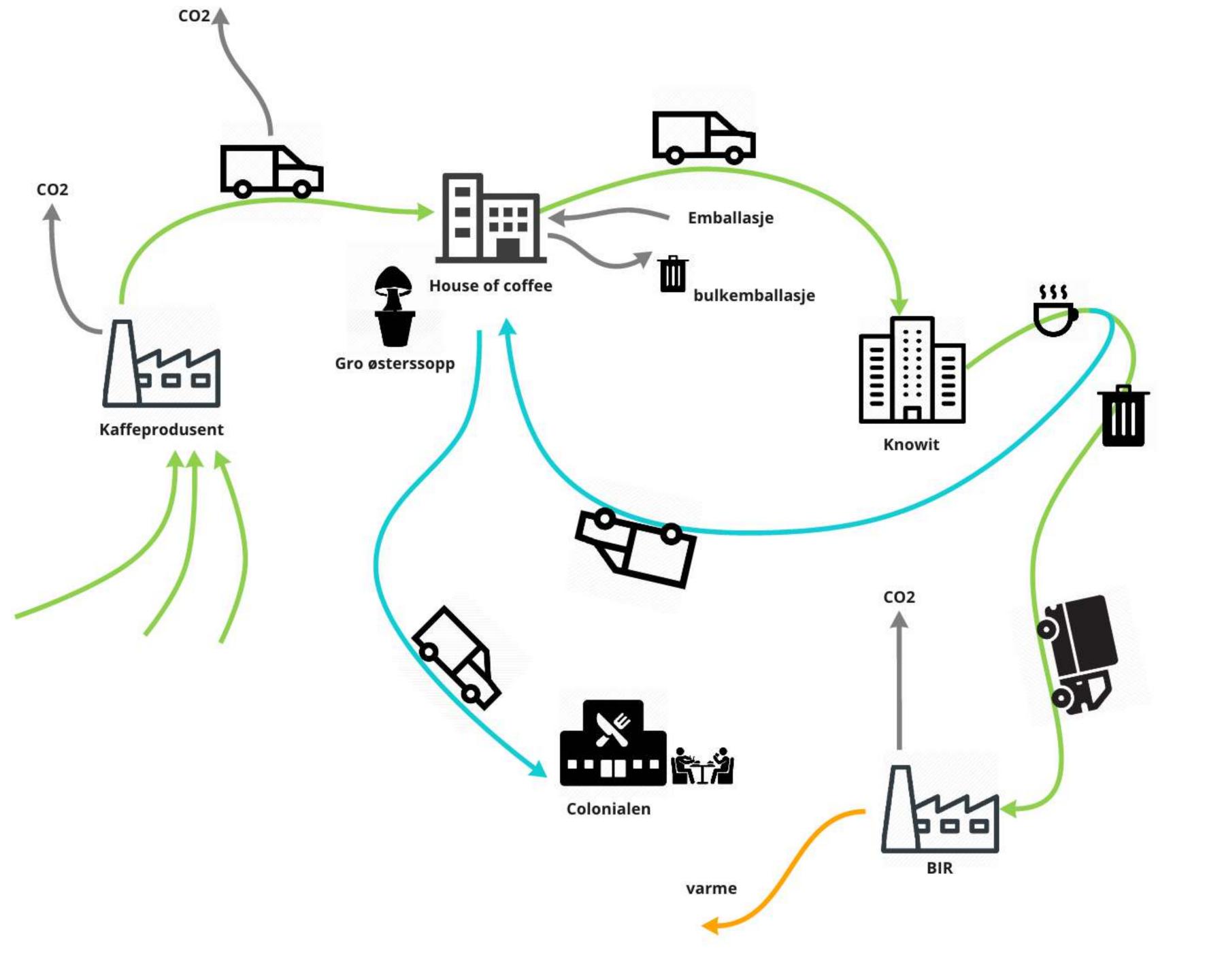
- 1) Choose main character resource flow.
- 2) Place out all organisations.
- 3) Draw resource-flows in this sequence:
  - a) Main character resource
  - b) Means of transport
  - c) Waste sidestreams
  - d) Emissions and pollutants
  - e) Money
  - f) Data











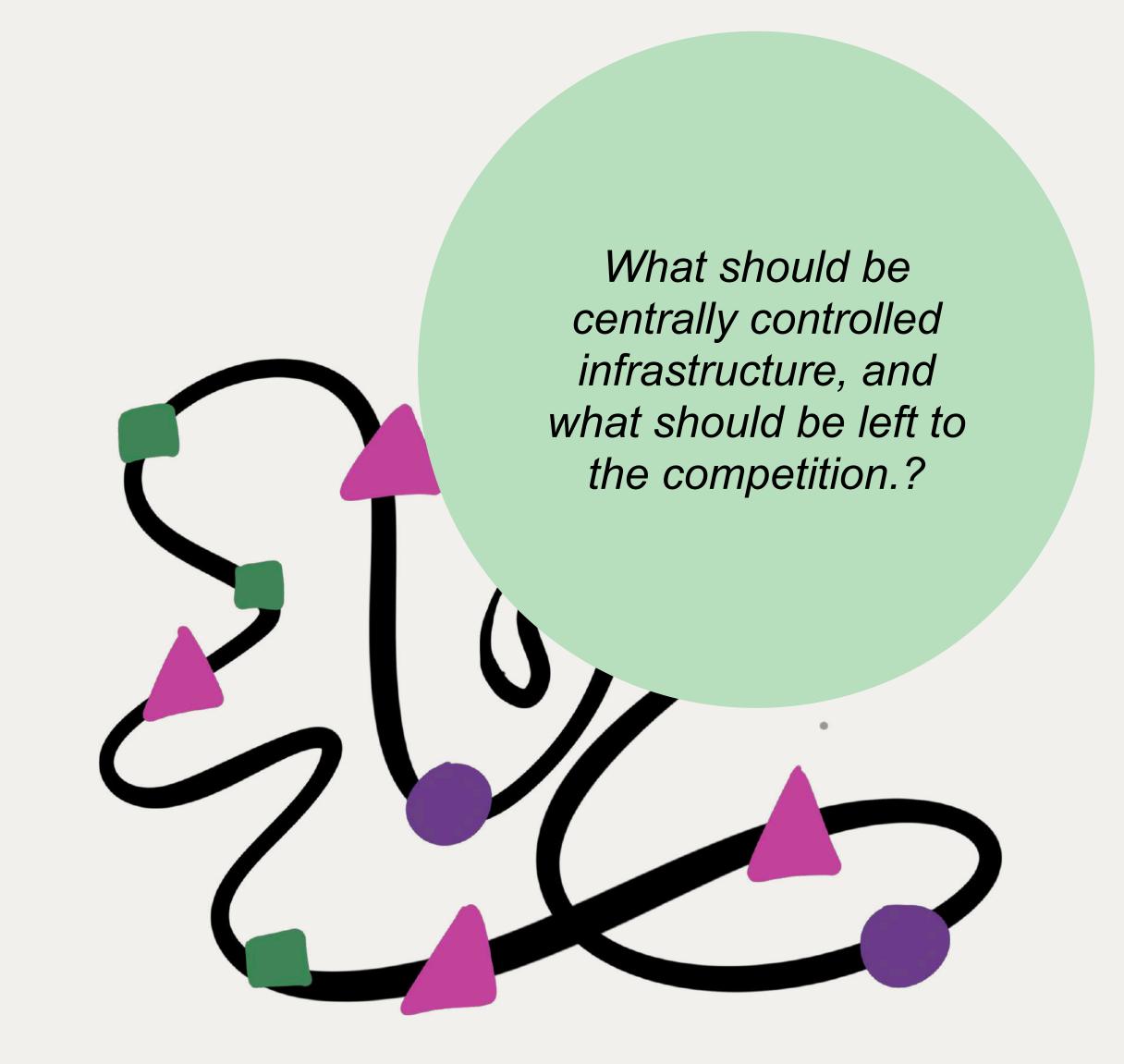
### > Common infrastructure

#### Goal

Make organisations aware of the system they rely on. The highway they all us - or need - to be able to effectively circulate resources, and thrive

#### i.e.

Watersystem, wastesystem, roads, the grid, thermal heat system, ecc



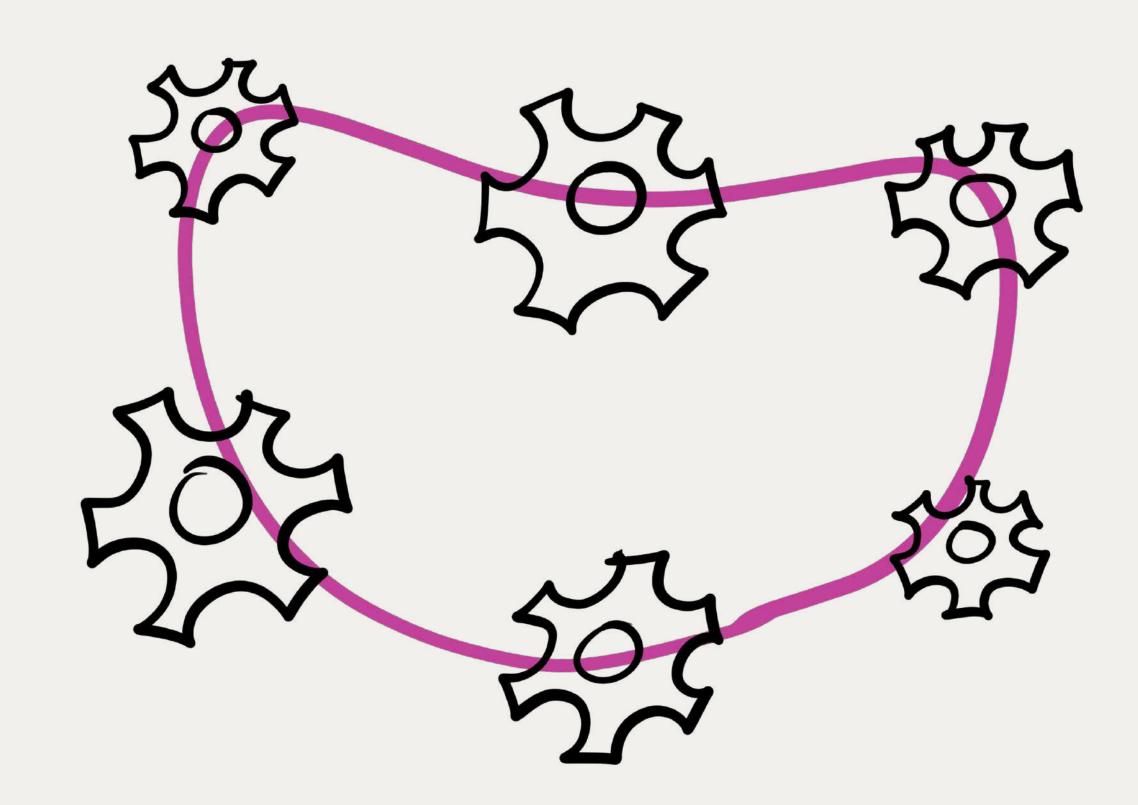
#### > Processes

#### Goal

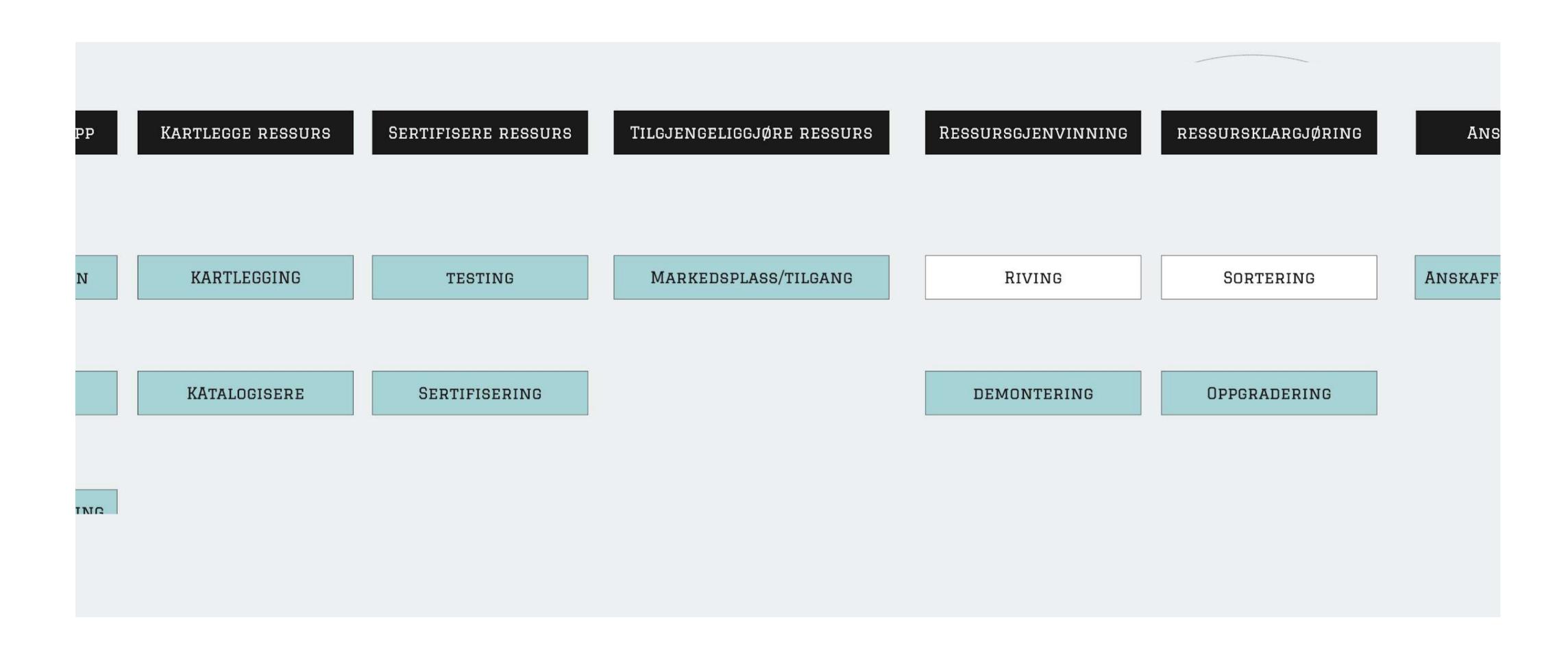
Describe what activities are done - or what needs to be done - in order to close a circular flow og create a circular market dynamics. Activities are described neutral without relating them to an organisation.

#### I.e.

For used building materials to be reused. For boats to be shared.



# I.e. Reuse of building materials



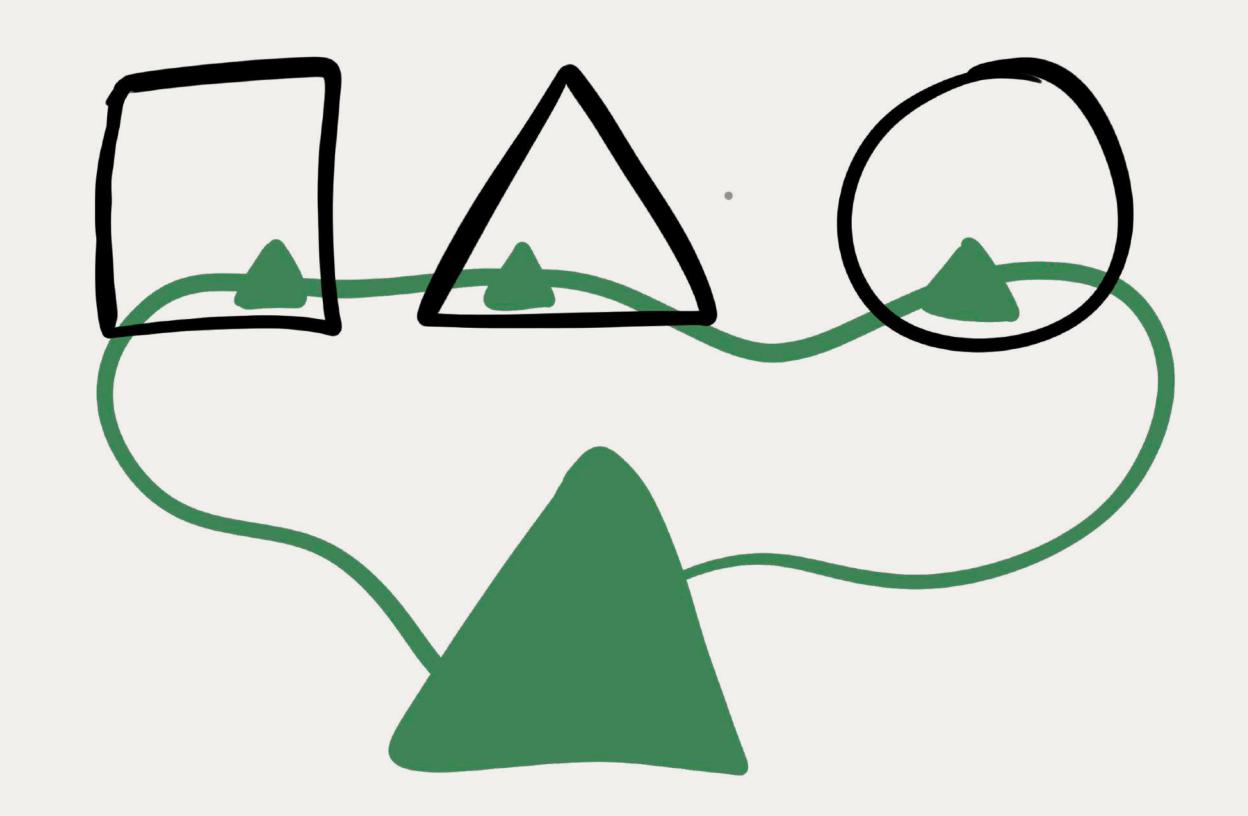
# > Sub-systems

#### Goal

See what subsystems different organisations use. Create effective flows based on knowledge of the volum hidden in amounts of small operations.

#### I.e.

We all purchase and waste bread. The industry all uses plastic films to wrap their stuff.



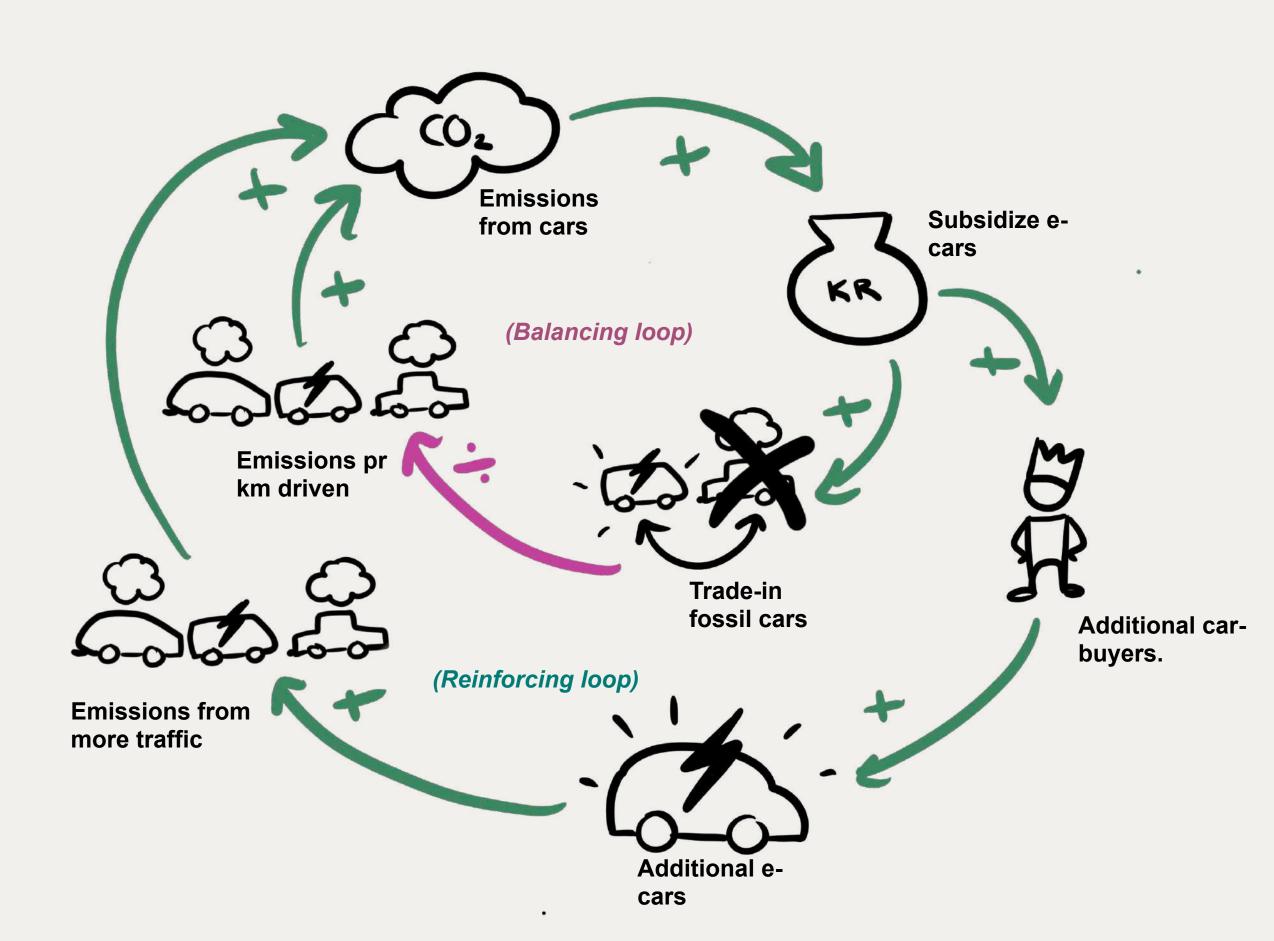
# > Causal mapping

#### Goal

Discover the unintended unwanted consequences of our actions. See how the system preserve its negative effect even when we believe we do right

#### I.e.

Electric cars filling up the public transport lane causing queues and idling emissions. Service models making us use more stuff.



Thank you @hannewetland



# Panel Discussion



Cathrine Barth Circularities





Susanne M. Nævermo-Sand Celsa Nordic





Hanne Wetland Knowit





Marthe Haugland Nordic Innovation





# Nordic Circular Hotspot Partner Program for market development

Founder & CEO
Natural State







# Partnership Programme for Circular Market Acceleration

The Nordic Circular Hotspot is launching a Partnership Programme for strategic, systemic and more efficient circular market development in the Nordics. We invite both the corporate segments, the private and public sectors and the regulatory & societal silos in the Nordic market sphere for **cross segment**, **cross sector** and **cross silo** circular collaboration in the Nordics. We are now developing a digital circular economy stakeholder platform called the **Nordic Circular Arena**, which we will pre-launch in June 2021.



Onboarding April 2021



Pre-launching
June 2021

# Circular Events 2021 Kickoff

BUSINESS FINLAND



