

# Frontrunners of the BioCircular Economy 2.0





# Greetings from the Nordic Circular Hotspot



**Cathrine Barth**

Managing Partner, Nordic Circular Hotspot  
Founder & Circular Strategist  
Circularities



**Einar Kleppe Holthe**

Managing Partner, Nordic Circular Hotspot  
Founder & CEO  
Natural State



# Nordic Circular Hotspot

## Managing Partners

## Co-Funding Partner



Elin Bergman  
Cradlenet (SE)



Marika Ollaranta  
Business Finland (FI)



Bjarni Herrera  
Circular Solutions (IS)



Einar Holthe  
Natural State (NO)



Cathrine Barth  
Circularities (NO)



Hrund Gunnsteinsdóttir  
Festa – Center for  
Sustainability (IS)



Harpa Júlíusdóttir  
Festa – Center for  
Sustainability (IS)



Isabella Holmgaard  
Lifestyle & Design  
Cluster (DK)



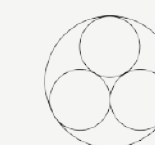
Kim Hjerrild  
Lifestyle & Design  
Cluster (DK)



Peter Michel Heilmann  
WholisticQ Holding (NL)



# Nordic Innovation



NATURAL STATE



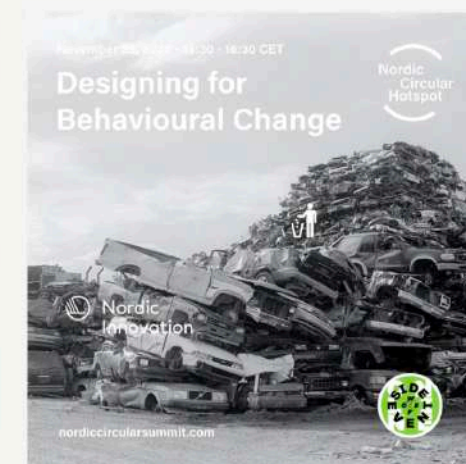
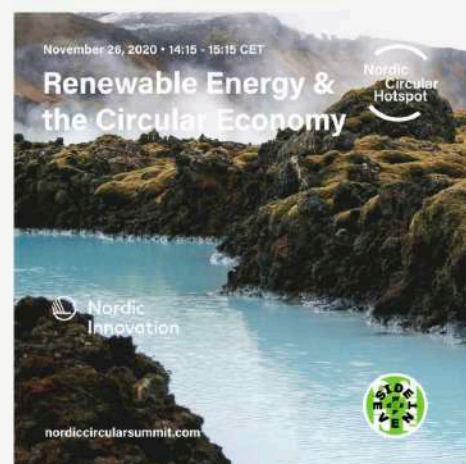
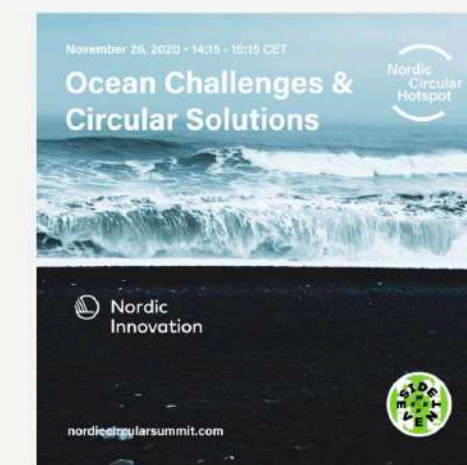
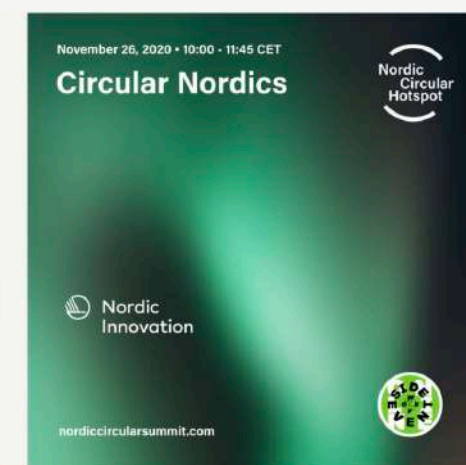
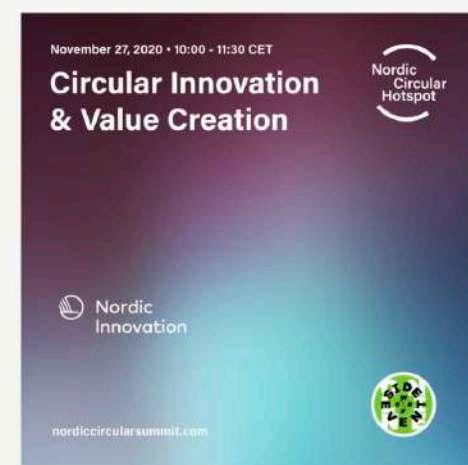
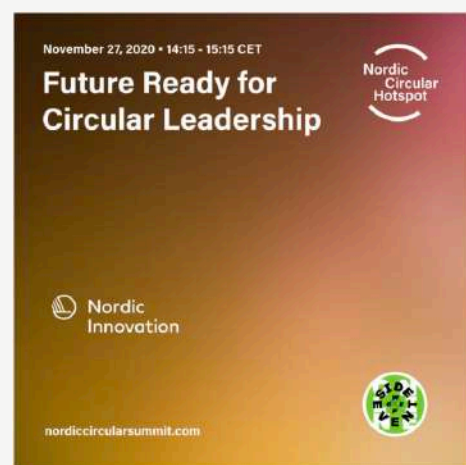
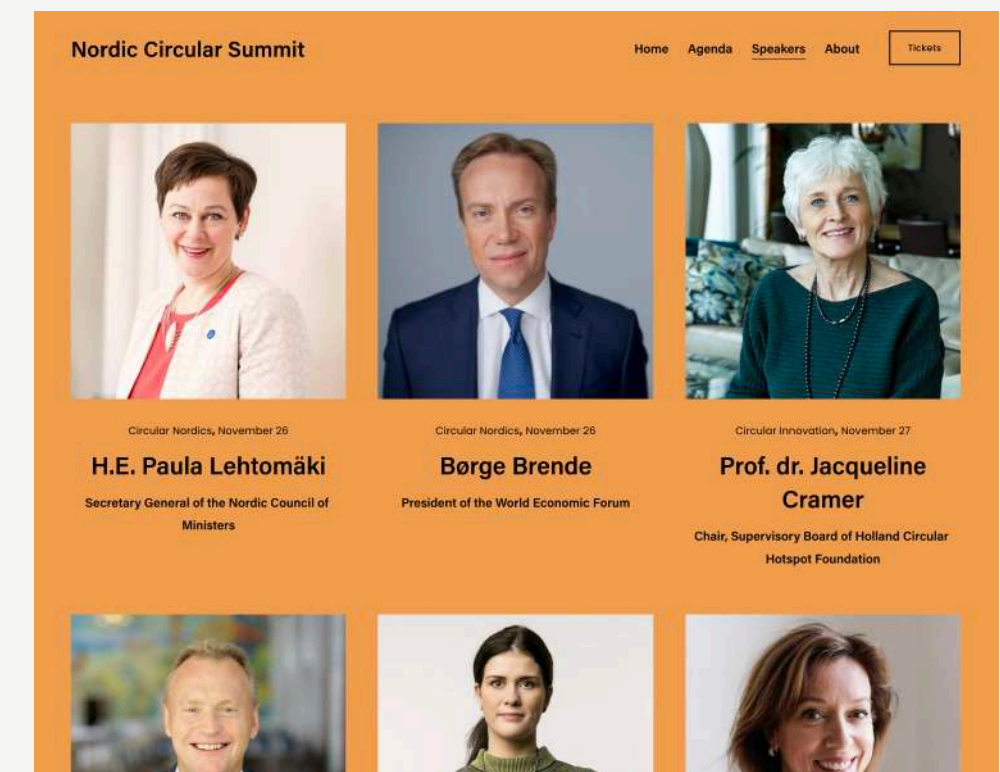


# Nordic Circular Summit



Nordic Circular Summit 2021:  
November 25 – 26

More information:  
[www.nordiccircularsummit.com](http://www.nordiccircularsummit.com)



NATURAL STATE





# Partnership potential

Brief overview of selected participants and speakers at the Nordic Circular Summit and seasonal events in 2020

5,000 webinar attendees to date  
Currently 3,200 interested stakeholders and 100+ interested partners enlisted  
Reach of 200,000+ through different channels





# Partnership programme



## Incentive

### Nordic Circular Hotspot's mission

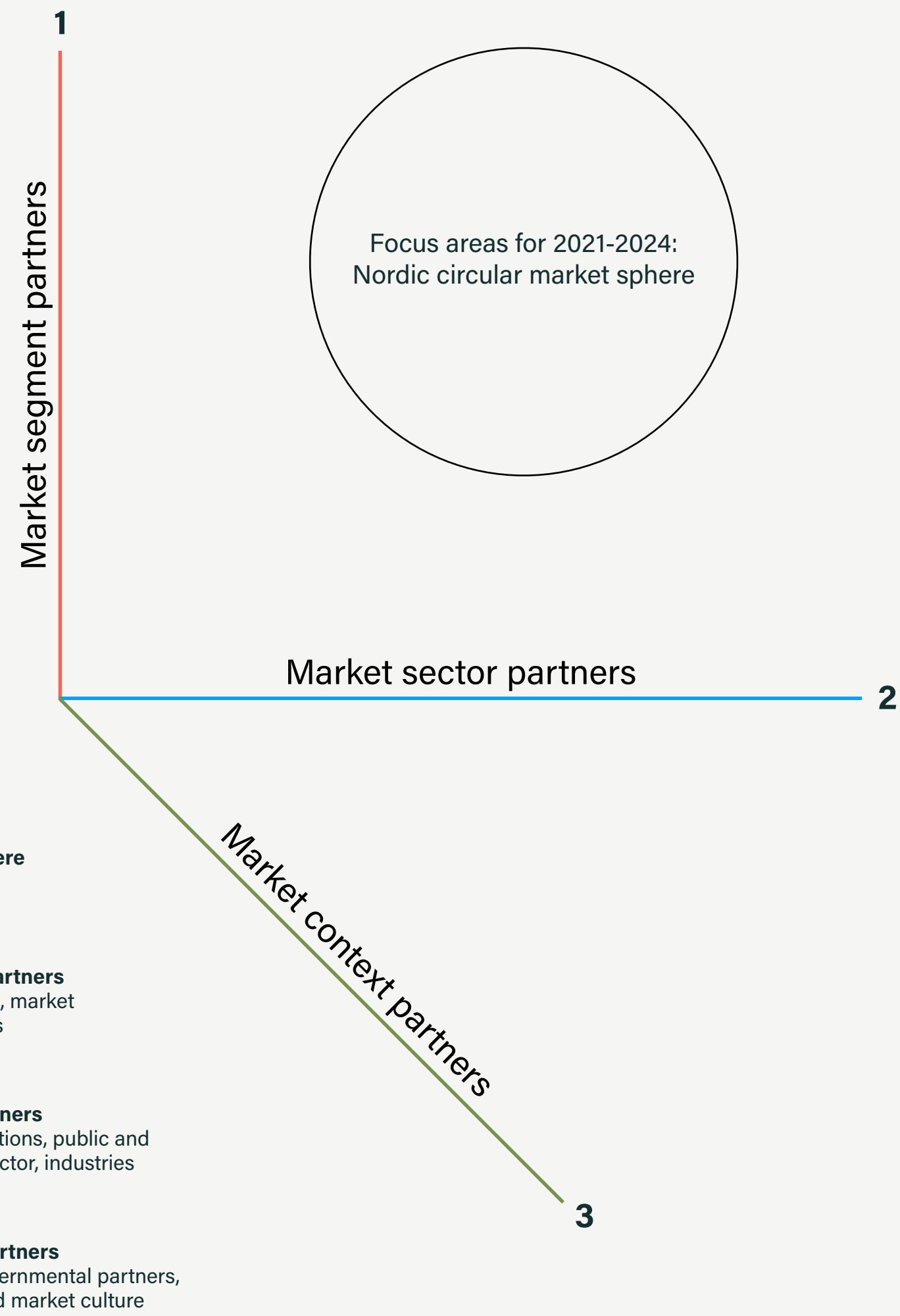
Accelerate the transition  
to a circular economy in the Nordics

## For who

Private and public industries, market segments and economic sectors, corporations, companies, SMEs, NGOs and public authorities. Partnership programmes are also available for networks, projects, event, media and companies based outside of the Nordics. Individuals are able to become personal members of the Nordic Circular Hotspot.

## Purpose

- 1 Build a common market culture and economic language for circular and sustainable value development in the Nordics
- 2 Stimulate cross-market segment, cross-economic sector and cross-regulatory silo collaboration and dialogue in the Nordic market sphere
- 3 Provide an accessible overview to help stakeholders navigate and co-ordinate in the Nordic market
- 4 Increase market dynamics, transactions and investments in circular and sustainable solutions
- 5 Define and align on the core circular and sustainable values of the Nordic market



## It's all about the value chains

A circular and sustainable transition of a market demands a deep understanding of value chains, and the roles of all stakeholders and their connection to the different B2B, B2P and B2C market segments.

We divide the circular market sphere of the Nordics into three categories

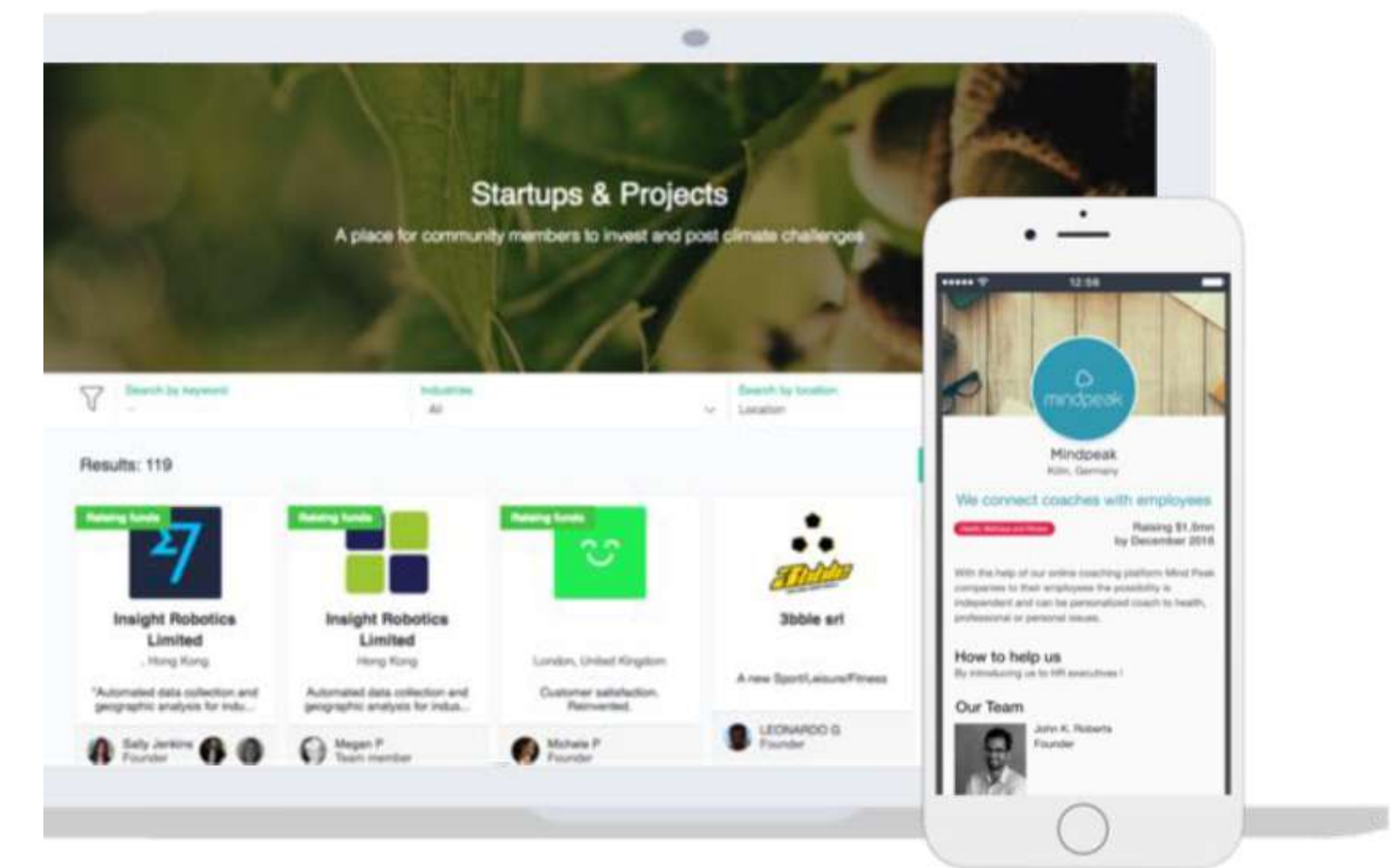
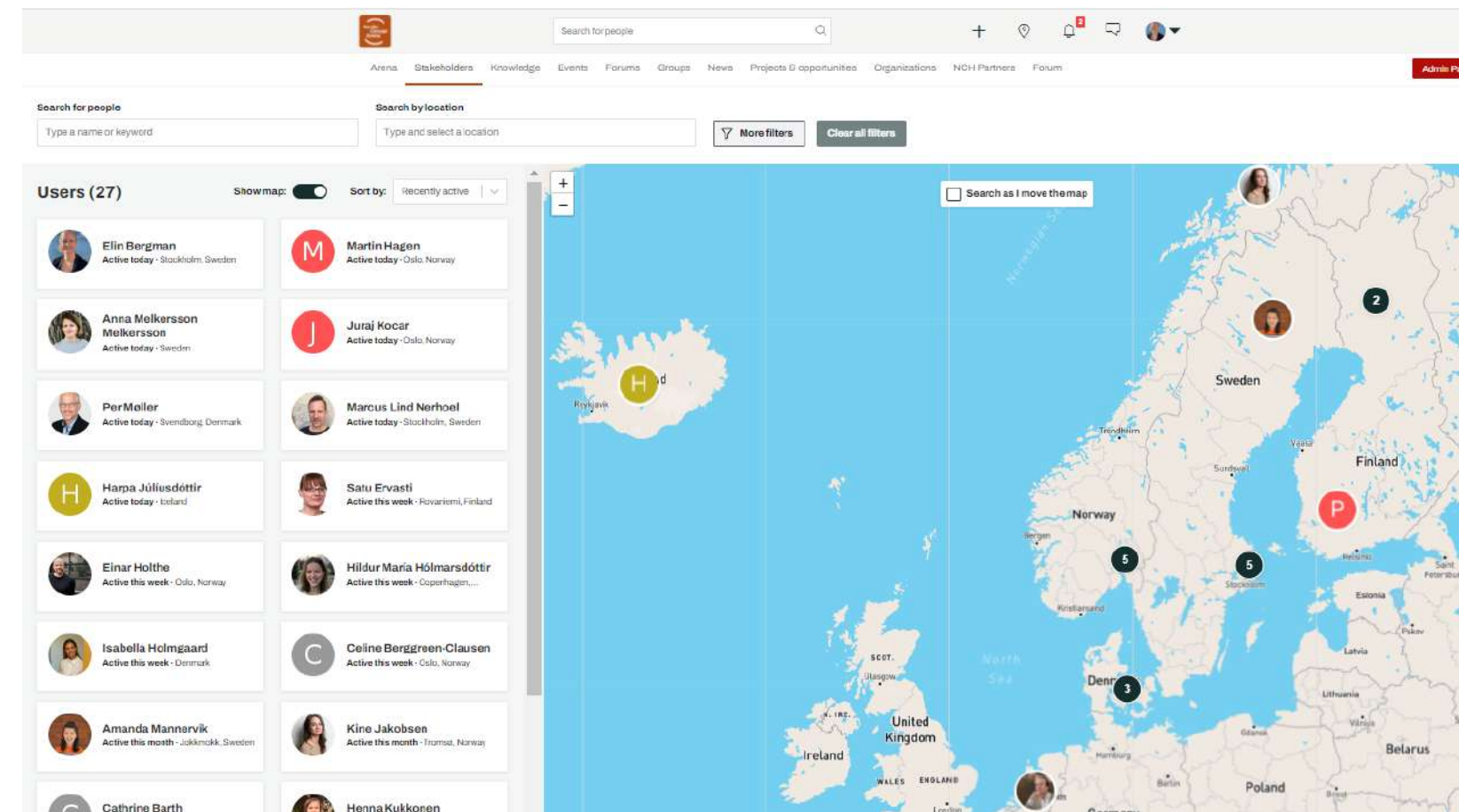
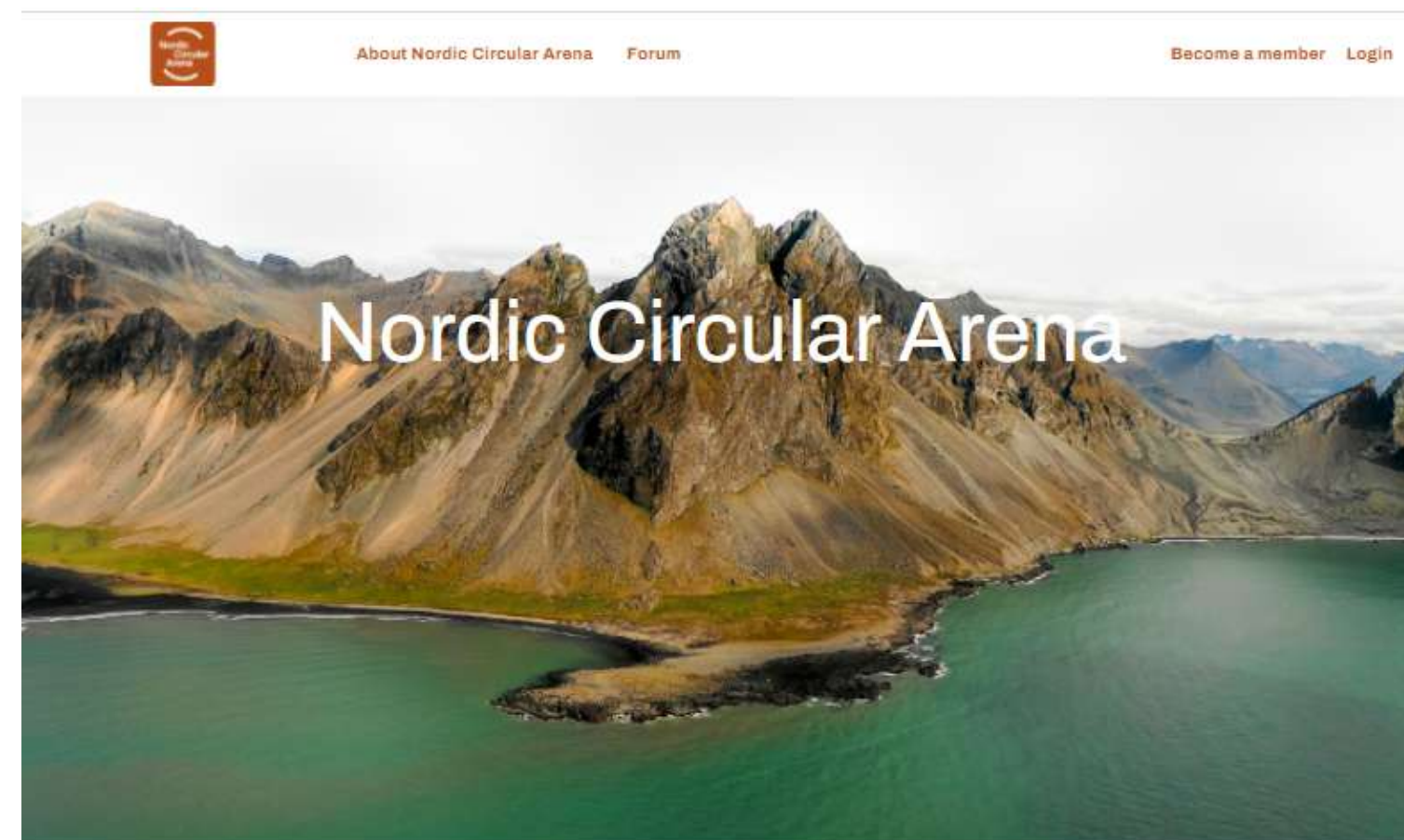
1. We see **market segments and natural resource value chains** as the **vertical factor**
2. Public and private economic sector, and industries representing **neutral market functions** in the value chains, we identify as the **horizontal factors**
3. The third factor is the place, the **context of region and market culture**, we identify as the **contextual factor**

Circular economy is about collaboration, and requires all stakeholders to work together to change the entire value sphere from the old, linear and sustainable state, to a circular and sustainable state.



# Nordic Circular Arena

The go-to-place for everything about circular economy in the Nordics



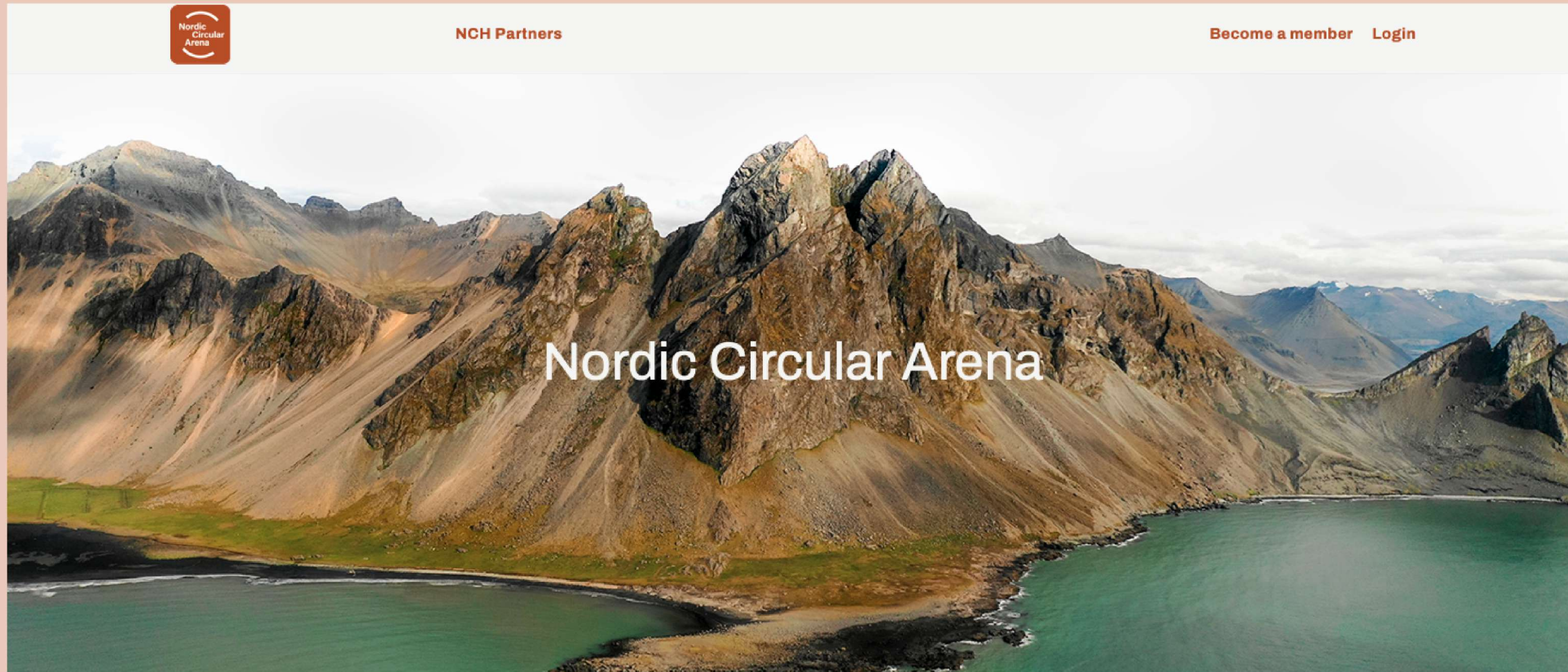
Free and open collaborating space for everyone - help us fill it with content!

**Launch: June 15**



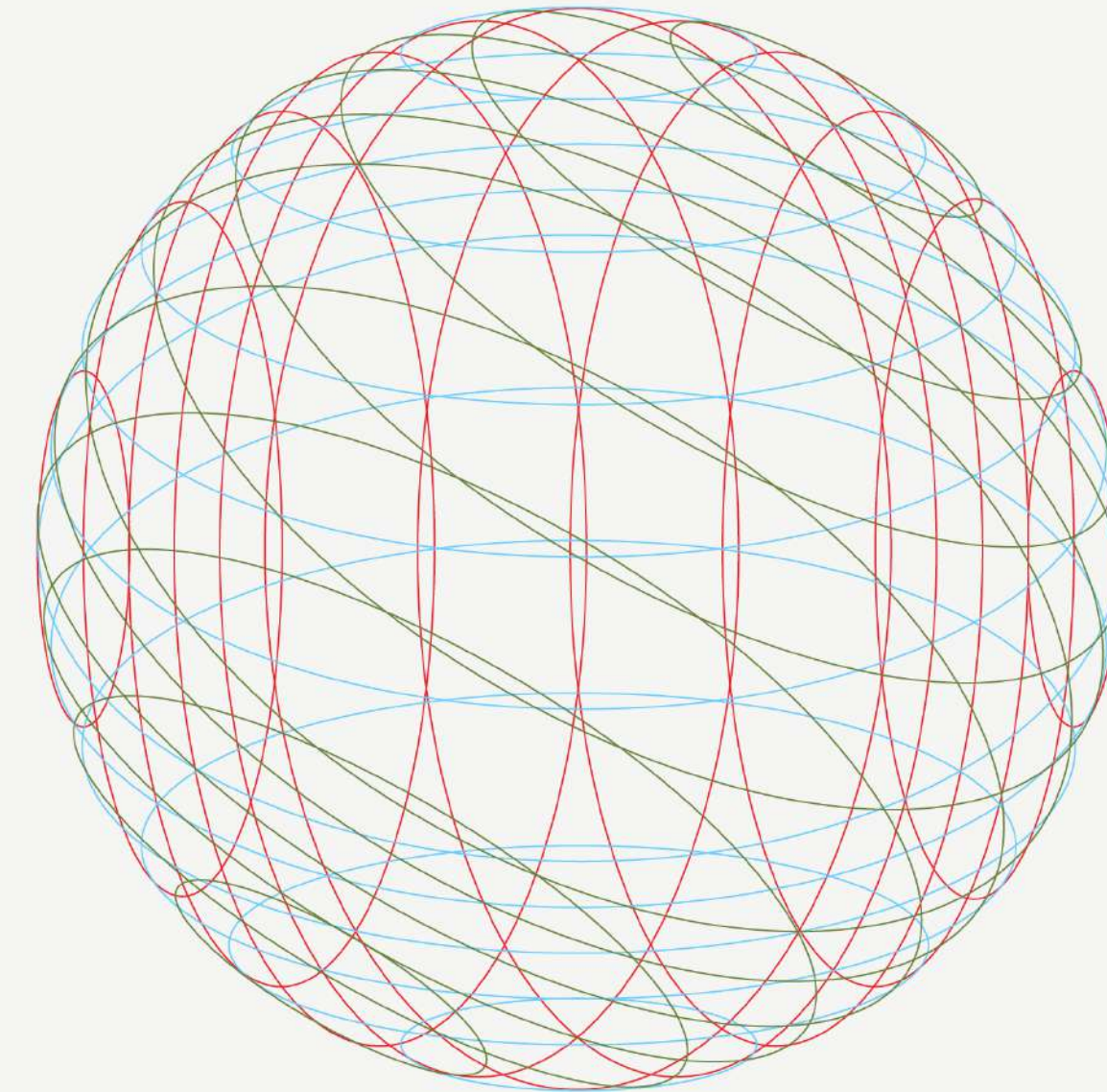
# Nordic Circular Arena Launch event

Online event  
**June 15,**  
**2021**

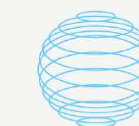




# Collaboration is key for circularity



**Market Segment Partners**  
Natural value chains, market segments and industries



**Market Sector Partners**  
Neutral market functions, public and private economic sector, industries



**Context partners**  
Regulatory and governmental partners, context of place and market culture

# Opening and roundtable introduction



**Freek van Eijk**

Director, Holland Circular Hotspot; Vice-Chair, Circular Biobased Delta; Vice-Chair of the Coordination Group, European Circular Economy Stakeholder Platform (ECESP)



**Peter Michel Heilmann**

Managing Partner, Nordic Circular Hotspot; Founder & Director WholisticQ Holding and 5Delta

# Hello and a warm welcome

## What do we hope to achieve at the end of this roundtable?




**Prof. dr. Jacqueline Cramer**  
Chair of the Supervisory  
Board, Holland Circular  
Hotspot



**Willem Sederel**  
Chair, Circular  
Biobased Delta

**Prof. dr. Jacqueline Cramer**  
Chair of the Supervisory  
Board, Holland Circular  
Hotspot



A portrait of Willem Sederel, a middle-aged man with thinning grey hair, wearing round glasses and a dark suit jacket over a light blue shirt. He is positioned in the center-right of the frame. The background consists of a light-colored wall with a grid pattern of vertical and horizontal lines, possibly from a door or paneling. The lighting is soft and even.

**Willem Sederel**  
Chair, Circular  
Biobased Delta



# Agenda

Roundtable part 1

## **Biorefineries and circularity—the path towards a BioCircular Economy 2.0?**

Time: 10:00-11:00 CEST

### **Hello from co-host Nordic Circular Hotspot**

- Cathrine Barth and Einar Kleppe Holthe

### **Opening and roundtable introduction**

- Peter Michel Heilmann, Freek van Eijk

### **Greetings from co-hosts Holland Circular Hotspot and Circular Biobased Delta**

### **Guest of honour, co-host and keynote speaker**

- Nina Kopola, Business Finland

### **Welcoming remarks**

- H.E. Mrs. Päivi Kaukoranta, Ambassador of Finland to the Kingdom of the Netherlands

### **Brief corporate presentations of frontrunners**

- Neste Corporation (Finland), Jeroen C. Verhoeven
- BTG Bioliquids BV (The Netherlands), Gerhard Muggen
- UPM - The Biofore Company (Finland), Jyrki Ovaska
- Fortum Corporation (Finland, video)
- Port of Rotterdam Authority, Nico van Dooren

### **Roundtable discussion: BioCircular Economy 2.0—Netherlands-Nordic leadership and collaboration in Europe**

- Dr. Heli Antila, Fortum Corporation
- Jeroen C. Verhoeven, Neste Corporation
- Gerhard Muggen, BTG Bioliquids BV
- Jyrki Ovaska, UPM - The Biofore Company
- Nico van Dooren, Port of Rotterdam Authority

### **Reflections from the EU**

- Dirk Carrez, Bio-based Industries Consortium (BIC)

### **Interactive talk**

- Franc Bogovič, MEP, Bioeconomy Working Group of the European Parliament Intergroup on “Climate Change, Biodiversity and Sustainable Development”

### **Wrap-up and close of part 1, break 11:00–11:10 CEST**

# Saving the world is good business

**Nina Kopola**  
Director General and CEO,  
Business Finland



**BUSINESS  
FINLAND**



# Welcoming remarks

**H.E. Mrs. Päivi Kaukoranta**  
Ambassador of Finland  
to the Kingdom of the Netherlands



Ambassade van Finland  
Den Haag

# **Biorefineries and circularity—the path towards a BioCircular Economy 2.0?**

**Brief corporate presentations of frontrunners**

# Biorefineries and circularity—the path towards a BioCircular Economy 2.0?



**Jeroen C. Verhoeven**  
Vice President Production  
Partner Management,  
Renewable Polymers and  
Chemicals, Neste  
(Finland)



**Gerhard Muggen**  
Managing Director, BTG  
Bioliquids  
(The Netherlands)



**Jyrki Ovaska**  
Executive Vice President,  
Technology (CTO), UPM - The  
Biofore Company  
(Finland)



**Nico van Dooren**  
Director New Business  
Development, Port of  
Rotterdam Authority  
(The Netherlands)

# Neste Corporation (Finland)

**Jeroen C. Verhoeven**

Vice President Production Partner Management,  
Renewable Polymers and Chemicals



NESTE

A man with short dark hair and a beard, wearing a blue quilted jacket, is shown in profile from the chest up. He is looking down at a smartwatch on his left wrist. The background is a solid light blue color. A white curved line graphic is positioned above the main text.

# Neste

– On a journey to  
a carbon neutral world

Jeroen Verhoeven | VP Renewable Polymers & Chemicals  
27th May 2021

Our company's purpose

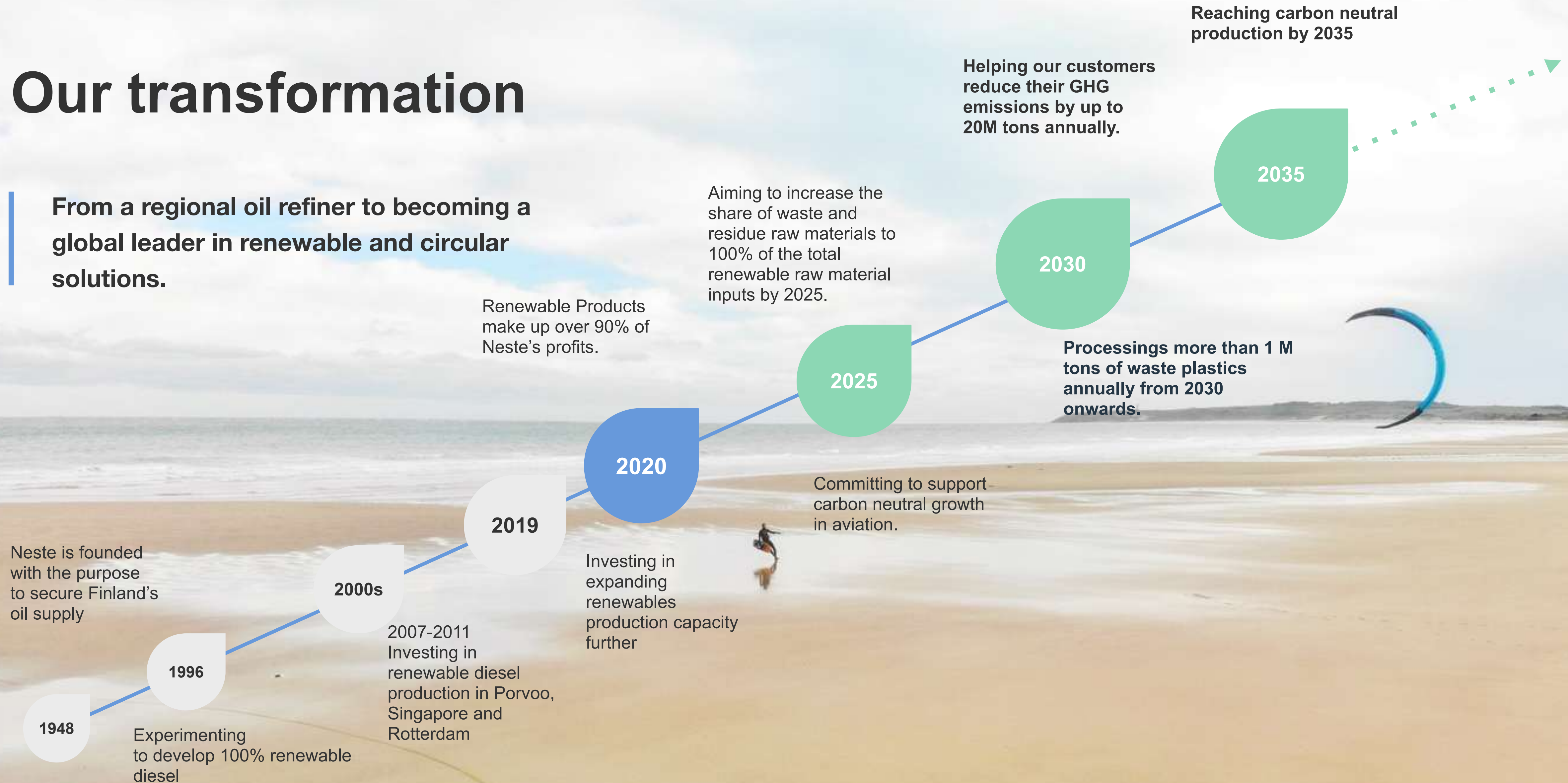
# Creating a healthier planet for our children

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# Our transformation

From a regional oil refiner to becoming a global leader in renewable and circular solutions.



# Three renewable businesses

– Now also helping the materials industry to transform

## Renewable Road Transport

Over the life cycle, Neste MY Renewable Diesel reduces greenhouse gas (GHG) emissions by up to 90% compared to fossil diesel.

## Renewable Aviation

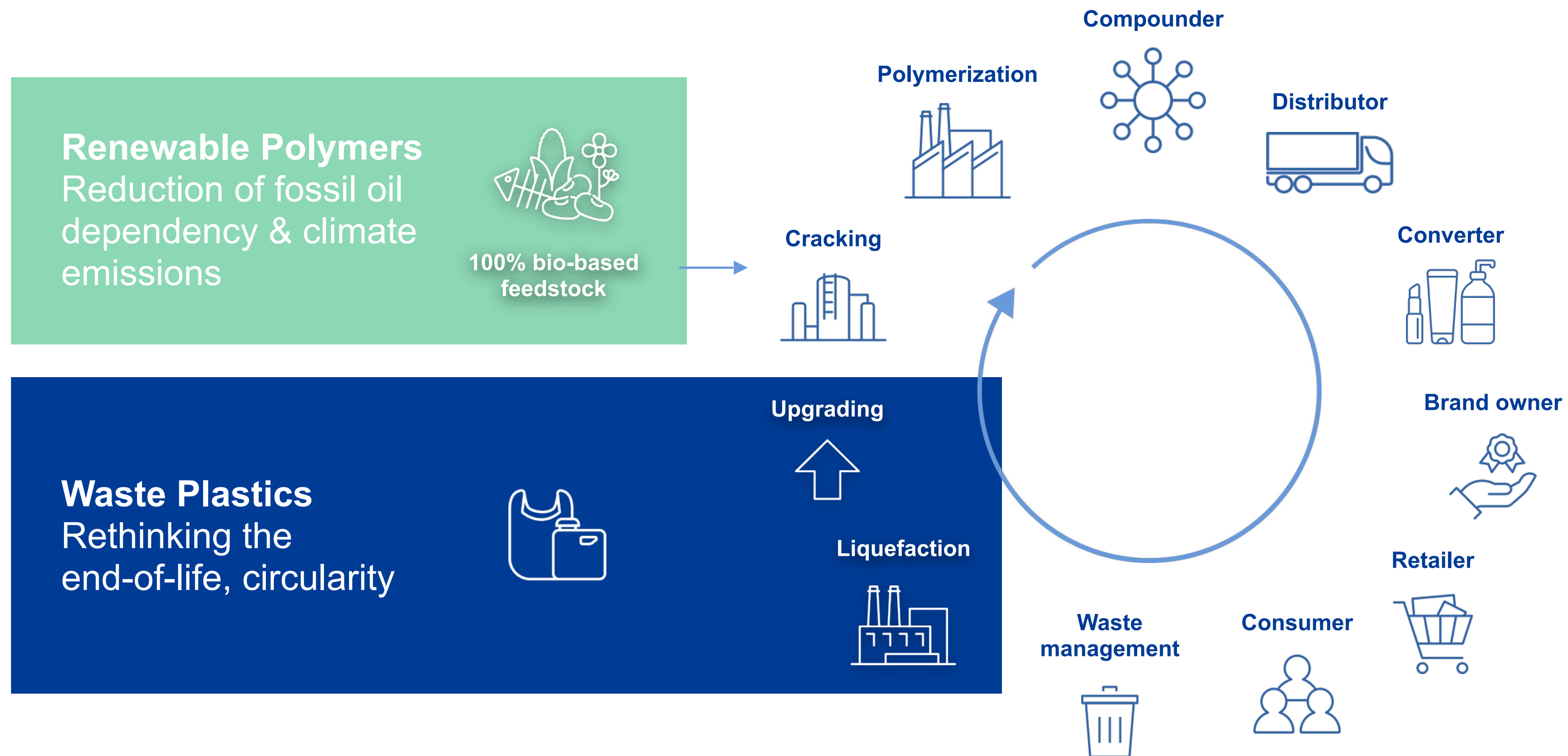
Over the life cycle, Neste MY Sustainable Aviation Fuel has up to 80% smaller carbon footprint compared to fossil jet fuel.

## Renewable Polymers and Chemicals

Neste RE Renewable and Recycled™ is Neste's solution for the plastics and chemicals sectors reduce crude oil dependency while also tackling climate change and plastic waste.



# Selling sustainability is always “value chain play”



# Collaboration with forerunners to develop circular value chains

2019

2016, Neste and **Ikea** of Sweden announce partnership to deliver renewable, bio-based plastics

2018, Neste sets a target to process annually more than one million tons of waste plastic by 2030.

Neste and **LyondellBasell** announce world's first bio-PE and bio-PP production

**Borealis** started producing certified renewable polypropylene from Neste's renewable propane in Belgium

2020

K 2019: **Clariant** launches a new product line based on Neste's renewable hydrocarbons

Neste starts collaborating with recycling experts **Ravago** and **Remondis**

Neste invests into **Recycling Technologies**, a specialist plastic recycling technology provider

**Covestro** received a first delivery of 1,000 tons of renewable phenol from Borealis, produced with renewable hydrocarbons from Neste.

Neste and **Jokey** started collaborating to develop the market for rigid packaging from sustainable renewable and recycled materials

Neste, Recycling Technologies and **Unilever** receive a £3.1m grant from UK Research and Innovation (UKRI) to develop chemical recycling

Neste and **DSM** announce strategic partnership

Neste and **LG Chem** into strategic partnership

2021

Neste RE, a 100% renewable and recycled raw material for plastics and chemicals production launched

Neste completes its first industrial-scale processing run with 400 tons of liquefied waste plastic in Finland

Neste acquires minority stake in **Alterra Energy**; companies partner to commercialize Alterra's waste plastic liquefaction technology in Europe

Neste announces collaboration with **Mitsui Chemicals** and **Toyota Tsusho**

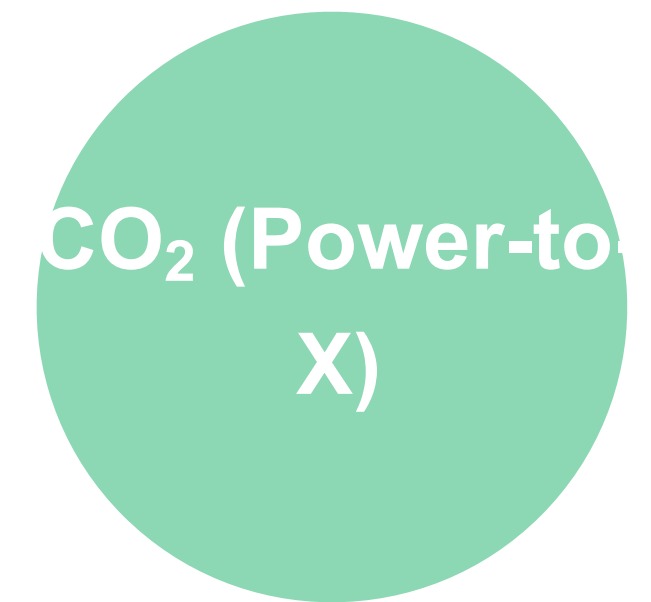
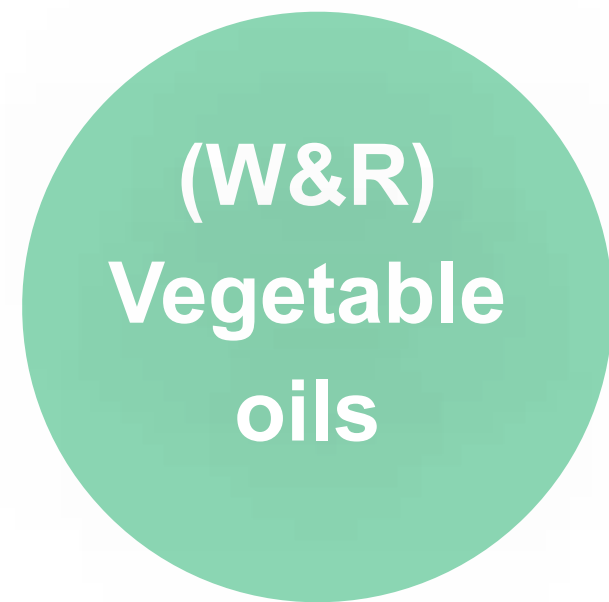
An underwater photograph featuring two large whales swimming in deep blue water. A scuba diver is visible on the left side of the frame, providing a sense of scale. A light green graphic element, consisting of a partial circle and a vertical line, frames the central text.

**Towards  
a more  
sustainable  
future  
together**

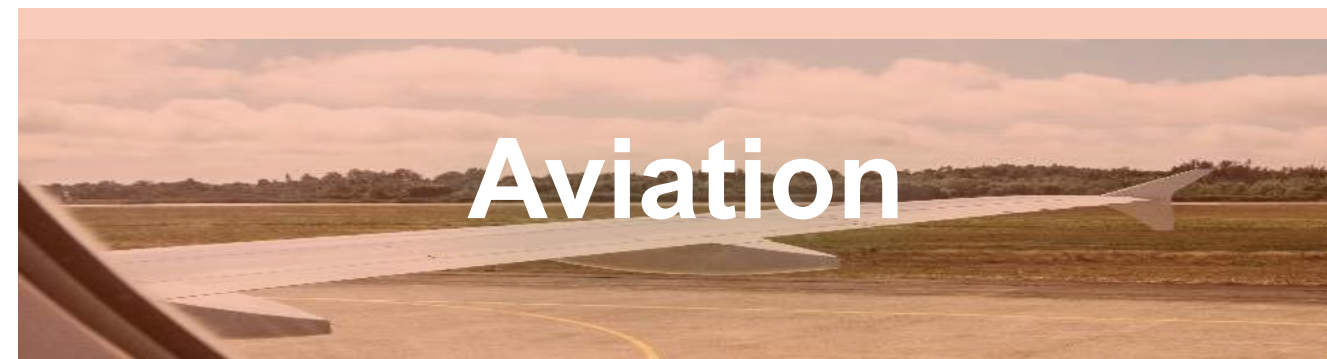
**NESTE**  
Change runs on renewables

# Neste develops sustainable and globally scalable solutions to tackle climate change

## SUSTAINABLE RENEWABLE AND RECYCLED RAW MATERIALS



## SUSTAINABLE PRODUCTS



# BTG Bioliquids (The Netherlands)

**Gerhard Muggen**  
Managing Director



BTG Bioliquids Pyrolysis Technology

## Nordic Circular Hotspot

Successful cooperation in the field of sustainable energy.

Gerhard Muggen  
May 27<sup>th</sup>, 2021



# BTG Bioliquids – We replace fossil fuels

## Company introduction

- As a **technology provider** and **product leader** we are committed to the commercial deployment of our fast pyrolysis technology.
- Explicitly made from biomass residues which is known as **second generation (2G)** or advanced biofuel which means that it does not compete with the food chain.



# Empyro

## The Netherlands

### In 24/7 operation since 2015

First commercial FPBO plant in the world at Twence/Empyro in the Netherlands, in 24/7 operation since 2015. Empyro is sold to Twence at the beginning of 2019.

- Biomass feedstock – wood residue
- Biomass input – 36.000 ton/year
- FPBO output – 24.000 ton/year
- Steam output – 80.000 ton/year
- Electricity output – 2.200 MWh/year



Front view of Empyro plant including bulk silo



# Empyro and more



# GreenFuel Nordic project (Finland)



- Delivery of modules to site summer 2020
- Mechanical complete October 2020
- First oil produced December 2020
- Small plant optimizations December 2020 and January 2021
- Continue production January 2021



# Pyrocell project (Sweden) from sawdust to tank

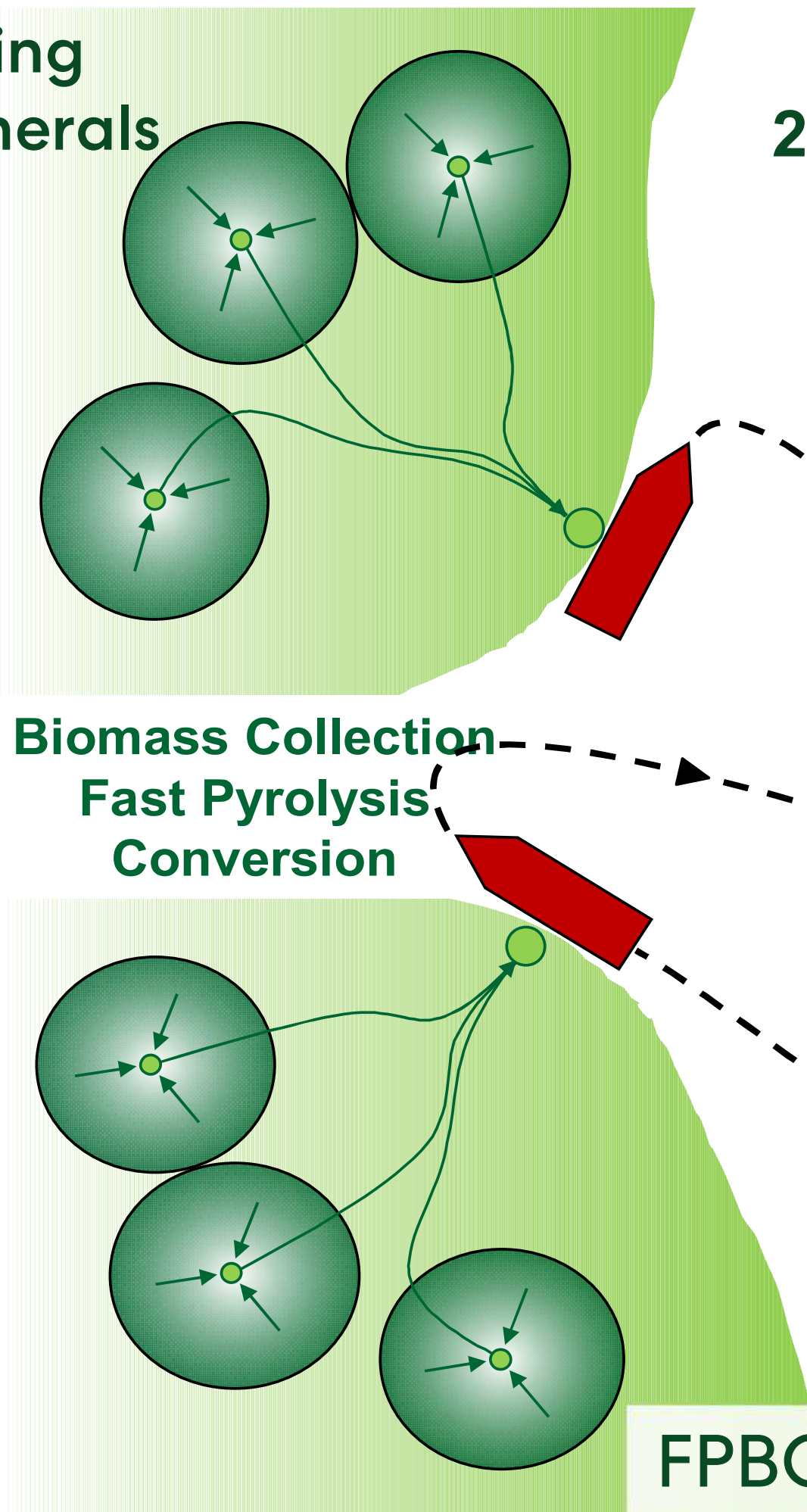
- Cooperation of Setra and Preem
- Production of bio-oil from sawdust – startup 2021
- Fast pyrolysis technology – annual bio-oil production 25,000 tonnes – GHG reduction vs fossil oil 80-90%
- Equivalent of 15,000 family cars can be powered per year
- Comply with the European RED II directive

The Setra logo consists of an orange icon of three curved shapes to the left of the word "Setra" in a bold, dark blue sans-serif font.

# Fast Pyrolysis in the Bio-Based Economy

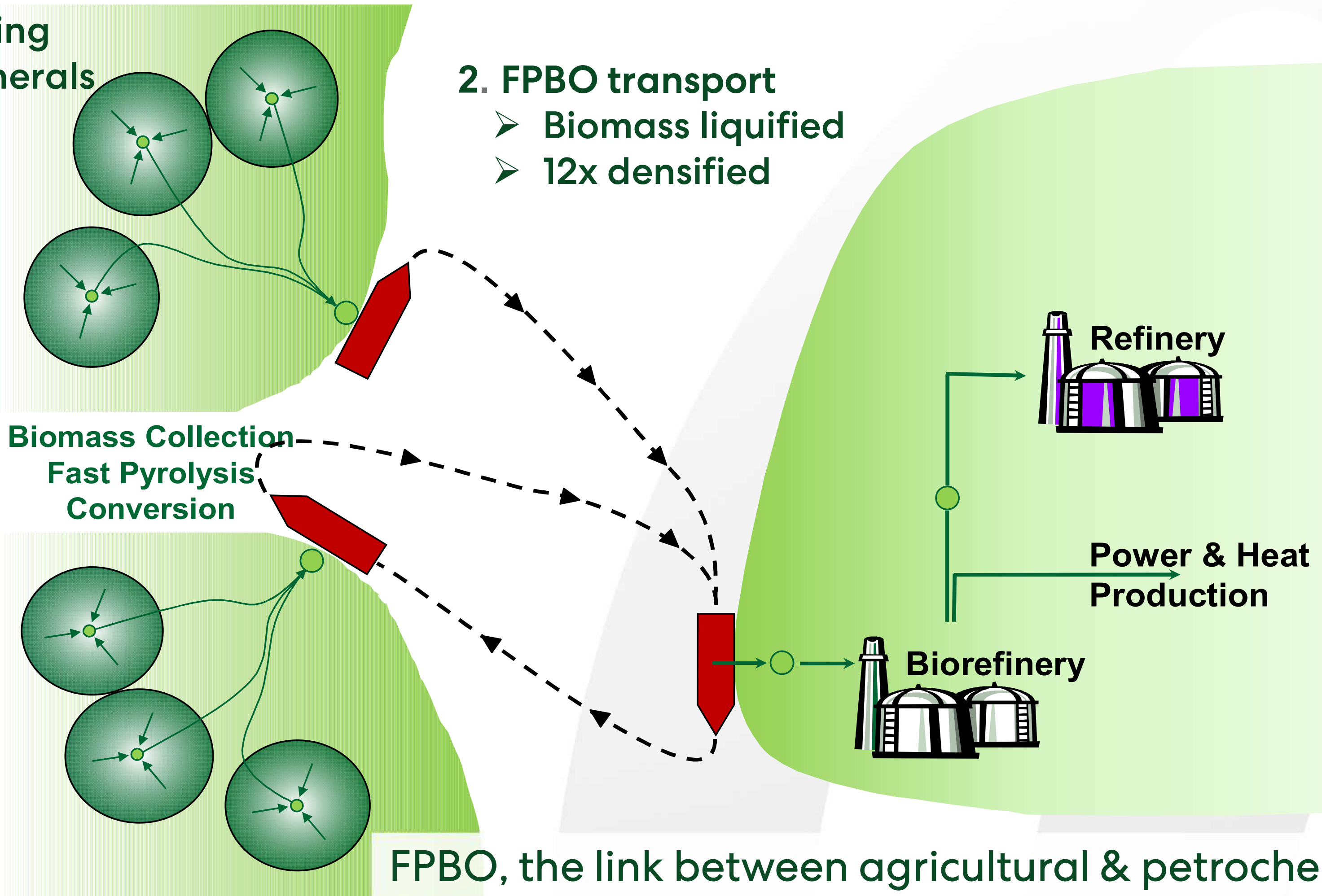
## 1. Biomass conversion in Scandinavia

- Local processing
- Returning minerals



## 2. FPBO transport

- Biomass liquified
- 12x densified



## 3. Processing & distribution (worldwide)

- Centralized
- Existing infrastructure

FPBO, the link between agricultural & petrochemical industries!



# Summary and perspectives

- Fast pyrolysis is proven at commercial scale, worldwide capacity is expanding
- More applications of pyrolysis oil under development, pyrolysis as starting point of bio liquids refinery
- Scandinavia is an excellent area due to sustainable biomass availability and green attitude in society.
- Scandinavia as a potential supplier of sustainable materials, energy and chemicals.

# Thank you

Josink Esweg 34  
7545 PN Enschede  
The Netherlands

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T: +31 (0)53 240 2000  
E: [office@btg-bioliquids.com](mailto:office@btg-bioliquids.com)

 @BTG Bioliquids

 /BTG Bioliquids

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20.02

# UPM – The Biofore Company (Finland)



**Jyrki Ovaska**  
Executive Vice President, Technology (CTO)





UPM

# Beyond Fossils in brief

## Nordic-Netherlands Roundtable

Jyrki Ovaska  
Chief Technology Officer  
May 27<sup>th</sup> 2021



# UPM Today



## UPM BIOREFINING

Pulp  
Plantations  
Biofuels  
Sawmills  
Wood Sourcing  
and Forestry

## UPM ENERGY

Hydro-, nuclear-  
and thermal power  
(incl. shares in  
energy companies)  
Electricity generation  
and trading  
Optimisation services

## UPM RAFLATAC

Label materials for  
branding and  
promotion,  
informational labels,  
and labels with  
functionality

## UPM SPECIALTY PAPERS

Labelling materials,  
release liners,  
flexible packaging  
papers, office and  
graphic papers

## UPM COMMUNICA- TION PAPERS

Extensive product  
range of graphic  
papers for  
advertising and  
publishing  
as well as home  
and office uses

## UPM PLYWOOD

WISA® Plywood  
and veneer products  
for construction and  
industrial  
applications

## UPM BIOCHEMICALS

Wood-based biochemicals  
for variety of industrial  
uses

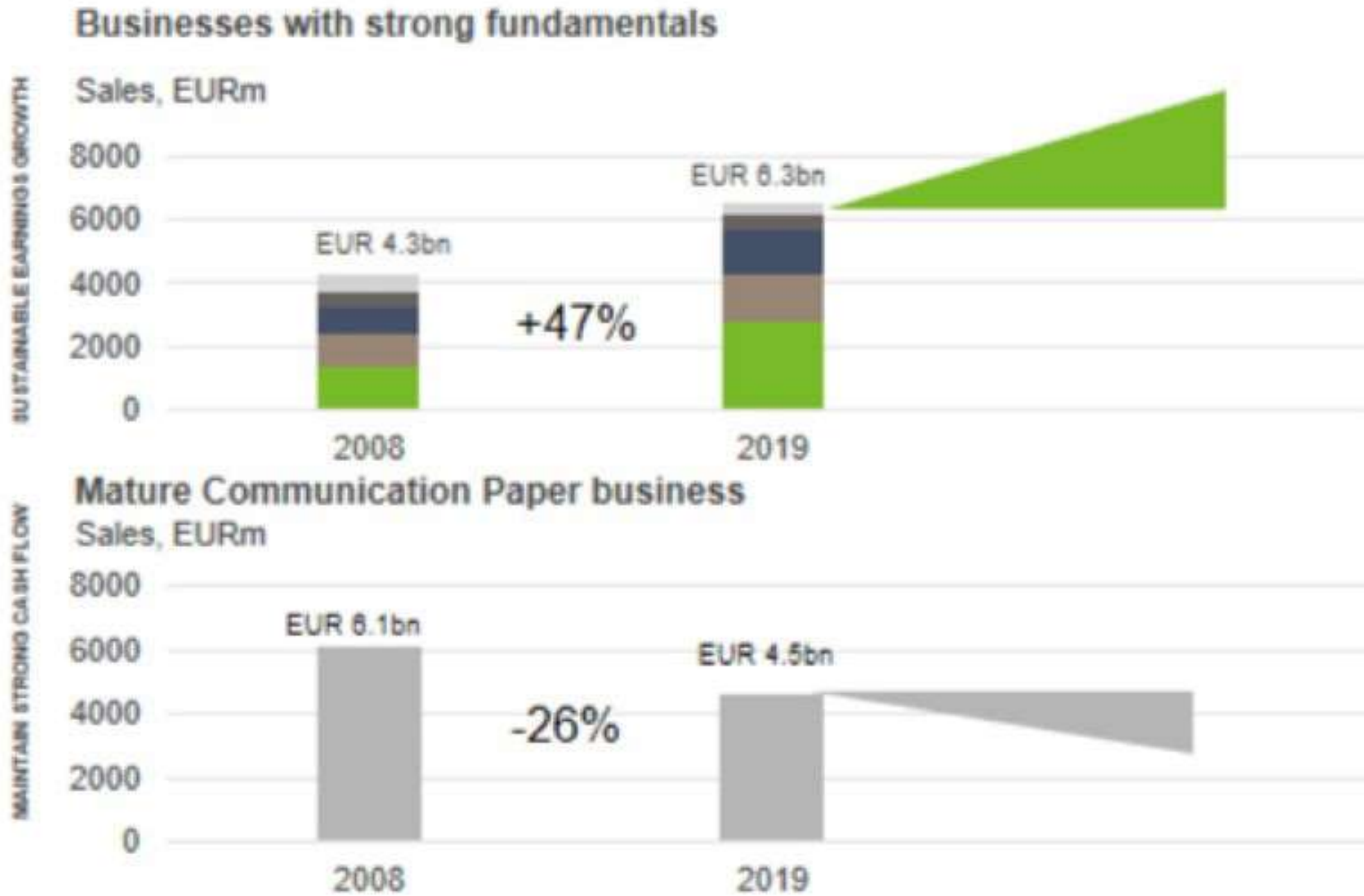
## UPM BIOMEDICALS

Wood-based products for  
biomedical applications

## UPM BIOCOMPOSITES

UPM ProFi decking products  
and UPM Formi granulates

# Case UPM : Structural change



Expand the well performing growth businesses + develop new businesses

Maintain strong cash flow

# UPM **BIOFORE** **BEYOND** FOSSILS



**INSPIRED** by the limitless opportunities of bioeconomy  
**DELIVERING** renewable and responsible solutions  
**INNOVATING** for a future beyond fossils



UPM

# New horizons in bioeconomy



**Biomolecules**

Biofuels  
Biochemicals



**Fibres**

Pulp  
Paper  
Packaging  
Tissue  
Labelling materials  
Biocomposites  
Textile fibers  
Cellulose derivatives



**Logs**

Sawn timber  
Plywood



**Trees**

Energy

# New green growth

## Advanced biofuels



## Biochemicals



## Biomedicals



## Hydrogen and P2X



# We deliver positive impact to mitigate climate change and to create long-term value



## WE ACT THROUGH FORESTS

Climate-positive forestry and enhancing biodiversity.



## WE ACT THROUGH EFFICIENCY AND EMISSIONS

Target to reduce our CO<sub>2</sub> emissions by 65%.



## WE ACT THROUGH PRODUCTS

Innovate novel products as sustainable alternatives for fossil-based materials.



**BUSINESS AMBITION FOR 1.5°C**   **OUR ONLY FUTURE**

**THE Paris...  
CLIMATE 10 years  
PLEDGE Early**

# Implementing the green transition

The ultimate carbon cycle above the ground



UPM



# Creating new business in wood-based biochemicals



**EUR 550 million investment at Leuna, Germany**



Industrial scale biorefinery



Alternatives to fossil materials in various consumer-driven end-uses



Total annual capacity of 220,000 tonnes



Scheduled to start up by the end of 2022



# Growth plans in biofuels progress to the next stage



**Basic engineering phase of new biorefinery ongoing**



Potential next generation biofuels biorefinery



Products would significantly reduce carbon footprint in the road transport and aviation



Capacity would be 500,000t of renewable fuels incl. sustainable jet fuel



Potential location in Kotka, Finland or Rotterdam, the Netherlands.

# Leadership in responsibility



CLIMATE FORESTS WATER

Member of  
**Dow Jones  
Sustainability Indices**

Powered by the S&P Global CSA



Global Compact  
**LEAD**  
2020 PARTICIPANT

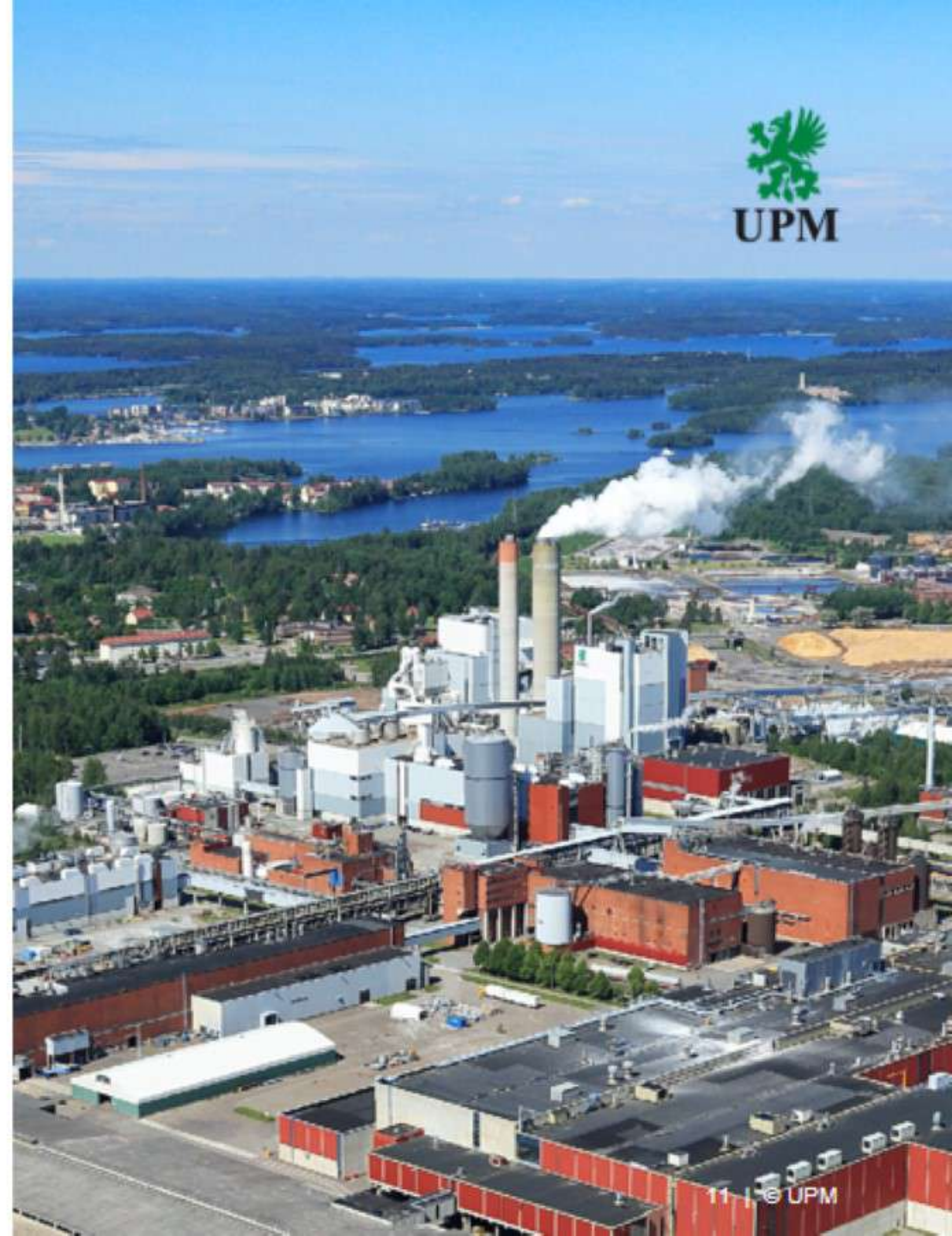
**MSCI**  
ESG RATINGS



CCC B BB BBB A AA **AAA**



UPM **BIOFORE-BEYOND** FOSSILS



# Future beyond fossils is a key driver for us



## FROM FOSSILS TO BIOECONOMY



# Fortum Corporation (Finland) video





**Materials such as  
birch, bamboo or straw  
used as biomass source**

# Port of Rotterdam Authority (The Netherlands)

**Nico van Dooren**  
Director New Business Development



# BIOBASED & CIRCULAR ECONOMY

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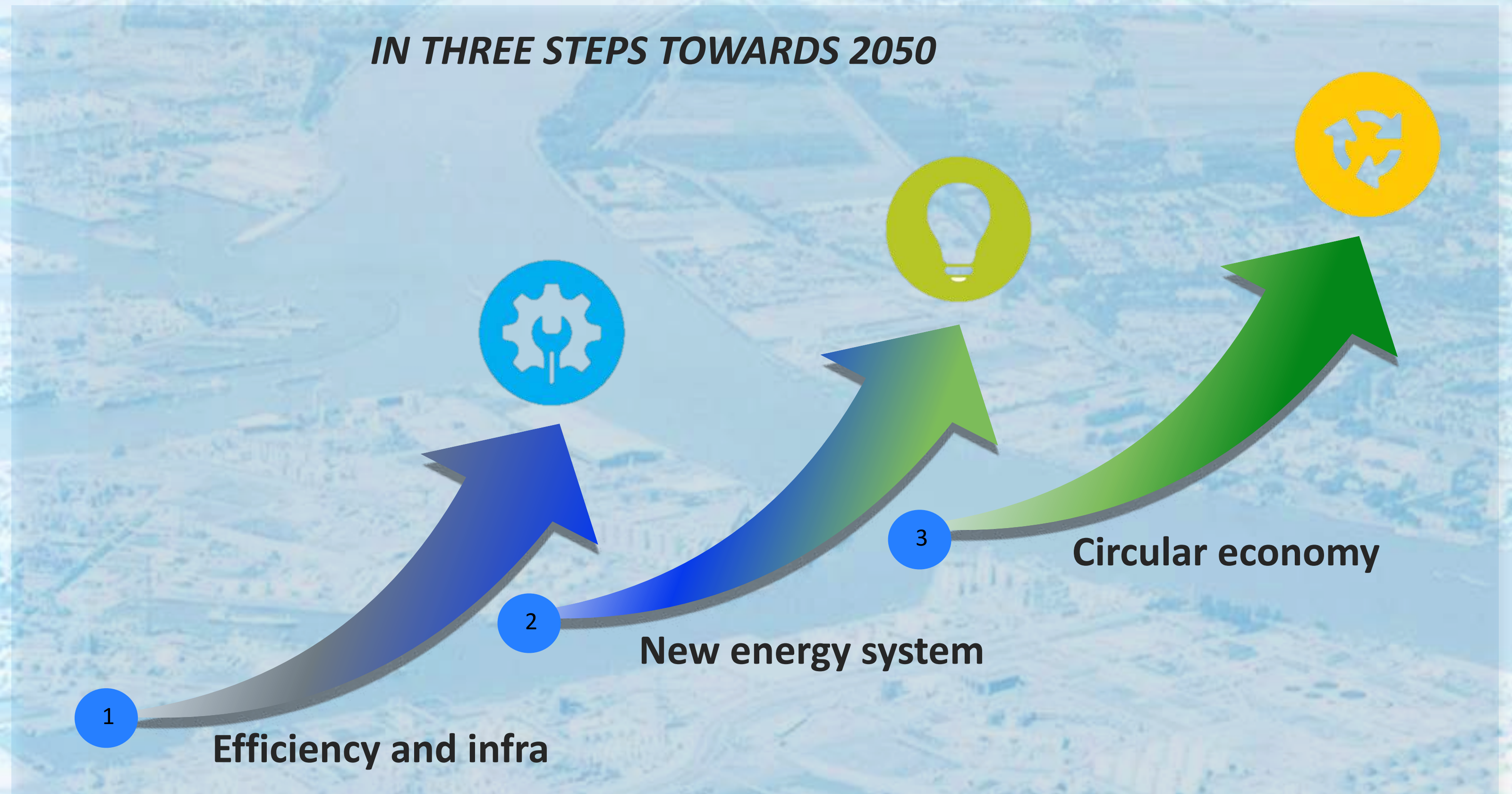
**Frontrunners of the BioCircular Economy 2.0–Nordic-Netherlands Roundtable**  
Nico van Dooren, Director New Business Development



# Energy transition in the Port of Rotterdam

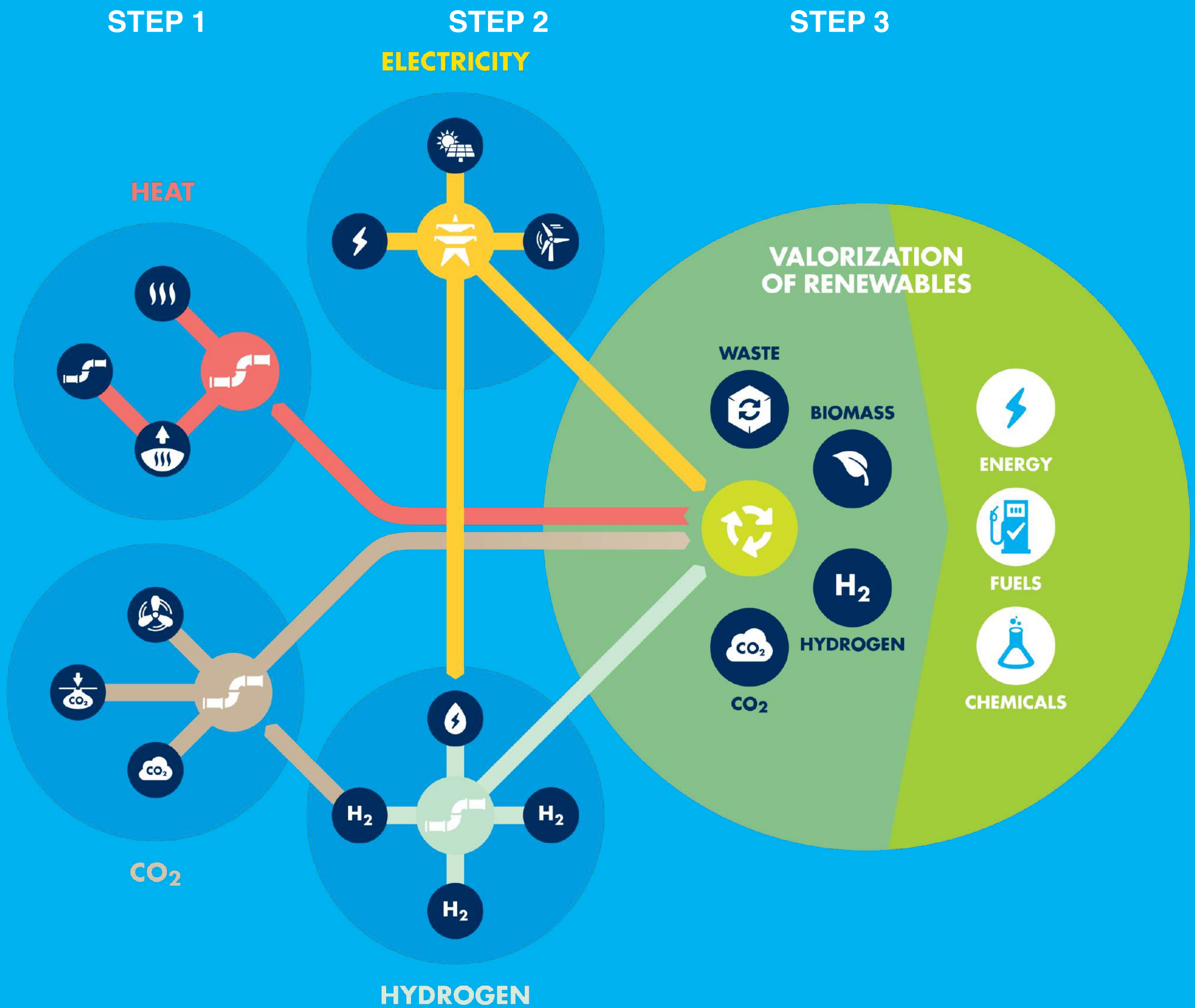
## AND-AND APPROACH

- And help existing industry and logistics cluster to adjust to future climate demands
- And attract new sustainable industries
- In doing so, protect and enhance economic value
- Carve out an enhanced competitive position





TOWARDS A CARBON NEUTRAL PORT



RENEWABLE FUELS & CHEMICALS

Sustainable infrastructure & energy sources provide foundation for renewable industry

Waste & biobased feedstocks as commodities available

Nordics & Rotterdam: UPM & Neste illustrate the climate for cooperation.

Rotterdam as logistics center for import/export of Nordics renewable energy & products

Renewable industry roll out requires EU wide policy development on markets & feedstocks





Roundtable discussion

# BioCircular Economy 2.0—Netherlands-Nordic leadership and collaboration in Europe



**Dr. Heli Antila**

Vice President, Biobased Solutions,  
Fortum



**Jeroen C. Verhoeven**

Vice President Production Partner Management,  
Renewable Polymers and Chemicals, Neste



**Gerhard Muggen**

Managing Director, BTG Bioliquids



**Jyrki Ovaska**

Executive Vice President, Technology  
(CTO), UPM - The Biofore Company



**Nico van Dooren**

Director New Business Development,  
Port of Rotterdam Authority

# Reflections from the EU

**Dirk Carrez**  
Executive Director, Bio-based  
Industries Consortium (BIC)



# The importance of the bioeconomy in Europe

**Franc Bogovič**

Member of the European Parliament  
(EPP, Slovenia), Chair of the  
Bioeconomy Working Group of the  
European Parliament Intergroup on  
"Climate Change, Biodiversity and  
Sustainable Development"





**BUSINESS  
FINLAND**



# Frontrunners of the BioCircular Economy 2.0





# Agenda

Roundtable part 2

## **Nordic and Dutch biocircular economy clusters—opportunities for co-innovation, collaboration, new products and markets**

Time: 11:10-12:10 CEST

### **Brief introduction and welcome by the co-moderators**

- Peter Michel Heilmann and Freek van Eijk

### **The Bioeconomy Regions in Scandinavia**

#### **(Sweden and Norway)**

- Monika Svanberg, The Bioeconomy Regions in Scandinavia

### **10-year plan for Circular Biobased Delta,**

#### **2020-2030 (The Netherlands)**

- Willem Sederel, Circular Biobased Delta

### **Bio-based Industries Consortium**

- Dirk Carrez, Bio-based Industries Consortium (BIC)

### **Roundtable discussion**

- Monika Svanberg, The Bioeconomy Regions in Scandinavia
- Willem Sederel, Circular Biobased Delta
- Dirk Carrez, Bio-based Industries Consortium (BIC)

### **Brief presentations and roundtable discussion with Nordic and Dutch clusters, hubs and projects**

- Bert Kip, CEO, Brightlands Chemelot Campus
- Dr. Hans Kleivdal, Executive Vice President, NORCE Norwegian Research Centre AS

- Dr. Agnieszka Szyk, INNOWO; Food Waste, Food System and Bioeconomy Leadership Group, ECESP

### **Roundtable discussion**

- Bert Kip, CEO, Brightlands Chemelot Campus
- Dr. Hans Kleivdal, NORCE Norwegian Research Centre AS
- Dr. Agnieszka Szyk, President, INNOWO and ECESP

### **Reflections and some recommendations**

- Prof. Emmo Meijer, Chemistry NL

### **Wrap-up and close**

#### **Digital Lunch**

- Meet the Nordic Circular Hotspot's Managing Partners, liaise with some of the roundtable speakers and have lunch virtually

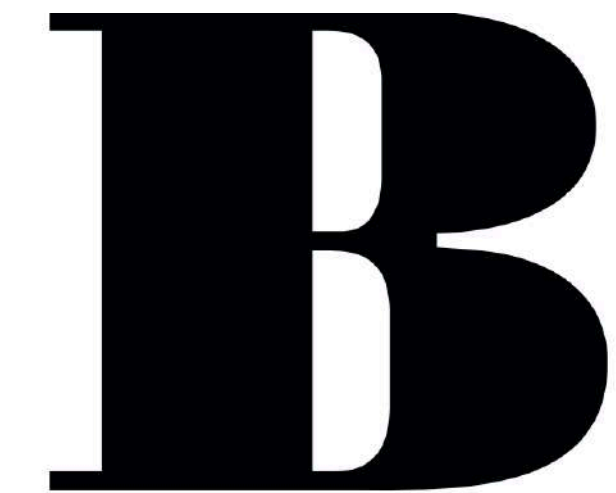




# Brief presentations of Nordic and Dutch clusters, hubs and projects

# The Bioeconomy Regions in Scandinavia (BRS)

**Monika Svanberg**  
Project Manager, The Bioeconomy  
Regions in Scandinavia



**The Bioeconomy Regions  
in Scandinavia**

# The Bioeconomy Regions in Scandinavia

Nordic-Netherlands Roundtable, May 27, 2021

Presentation by

Norwegian project manager Monika Svanberg,

Viken County Council



**B**

The Bioeconomy Regions  
in Scandinavia

**Interreg**  
Sverige-Norge



Europeiska regionala utvecklingsfonden EUROPEISKA UNIONEN

# BIOECONOMY REGIONS in Scandinavia

## VISION

*The Bioeconomy Regions in Scandinavia is the leading region within the forest-based bioeconomy - for a sustainable future*

## TASK

*The project will stimulate new tree-based innovations and support small and medium-sized enterprises by increasing the market and the companies' international competitiveness in the forest bioeconomy*



## PROJECT:

- 5 regions
- 32 partners
- EUR 1,225 million
- Project period: 2020-2022

## PARTNERS:

- Regions
- Universities and research institutions
- Private sector (industry networks, innovation centres, private companies)



The Bioeconomy Regions  
in Scandinavia

Interreg  
Sverige-Norge



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# Example - Industry focus

- *Make changes and innovations through collaboration*
- *Use sustainable resources and cross-boarder facilities*
- *Think reuse and circular*
- *Work together in the whole value chain*
- *Use political tools to create and support markets*



**Wood constructions**



**Packaging**



**New innovations**

**B**

The Bioeconomy Regions  
in Scandinavia

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Sverige-Norge



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# International context

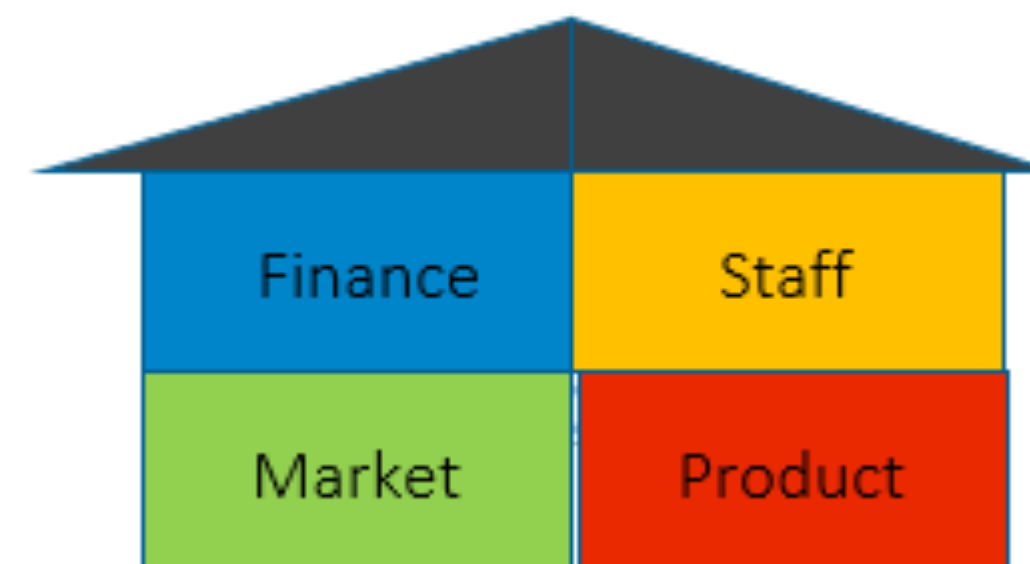
*Connect industry network, research institutions, regional authorities and politicians*

*Think reuse and circular together in the whole value chain across borders*



*Use sustainable resources and cross-boarder facilities*

*Use political tools to create and support markets*



**B**

The Bioeconomy Regions  
in Scandinavia

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# We look forward to hearing from you 😊

Project manager Monika Svanberg, Viken County Council, [monikasv@viken.no](mailto:monikasv@viken.no)

Project manager Sofia Nibblen-Berdtsson, Region Värmland,

[sofia.nibblen-berndtsson@regionvarmland.se](mailto:sofia.nibblen-berndtsson@regionvarmland.se)



Trebruk AS, Østfold forskning, ARD Innovation, NTNU Gjøvik, Tretorget AS, Sør-Hedmark næringshage AS, i4plastics v SINTEF Raufoss manufacturing, Gausdal Bruvoll SA, Den norske emballasjeforening, Pan Innovasjon AS, Norwegian Wood Cluster SA, Landsbyen Næringshage, Kvinner i skogbruket, Trevekst Oppland, Aggrator Inkubator AS, Termowood AS, Kløsser Innovasjon, SINTEF Manufacturing, Fremtidsmat, Regionalparken Haldenkanalen, Grønn Vekst Hallingdal v/ Flå Vekst, Norwegian Fashion Hub, Næringshagen i Østfold, Vitenparken og Buskerud Næringshage.



The Bioeconomy Regions  
in Scandinavia



The Bioeconomy Regions  
in Scandinavia



Europeiska regionala utvecklingsfonden



EUROPEISKA UNIONEN

Interreg  
Sverige-Norge



Europeiska regionala utvecklingsfonden EUROPEISKA UNIONEN

# Ten year plan for Circular Biobased Delta, 2020-2030 (The Netherlands)

**Willem Sederel**

Chair, Circular Biobased Delta;  
Non-Executive Director, Synova LLC







# Circular Biobased Delta: Ten year plan 2020-2030

Accelerating the feedstock transition with impact

Willem Sederel, chairman



# Introducing Circular Biobased Delta & Delta Community

## POSITION Circular Biobased Delta

### FRONTRUNNER THROUGH A COMBINATION OF

- chemical/biotechnological industry
- hightech agro- and horticulture
- unique logistic infrastructure (harbours)
- leading knowledge institutes
- involved governments



### ACCELERATION VIA

- biogenic routes
- circular solutions



Members of the Supervisory Board (Regional Development Agencies, execute on Behalf of the provinces)



## 10-year plan 2020-2030 Circular Biobased Delta Foundation

May 2020

Public version of the report



T +31 (0)6 4283 4362 | [InstaBiodelta](#) | [Over ons](#) | [Advertenties](#) | [Contact](#)

[Home](#) | [Aktueel](#) | [Network](#) | [Agenda](#) | [Word Partner](#)

## DELTA COMMUNITY

PODIUM VOOR BIOBASED BUSINESS

[PLANTS JOUW UITDAGING](#) | [ONTDEK ONS NETWERK](#)

250+  
Bedrijven

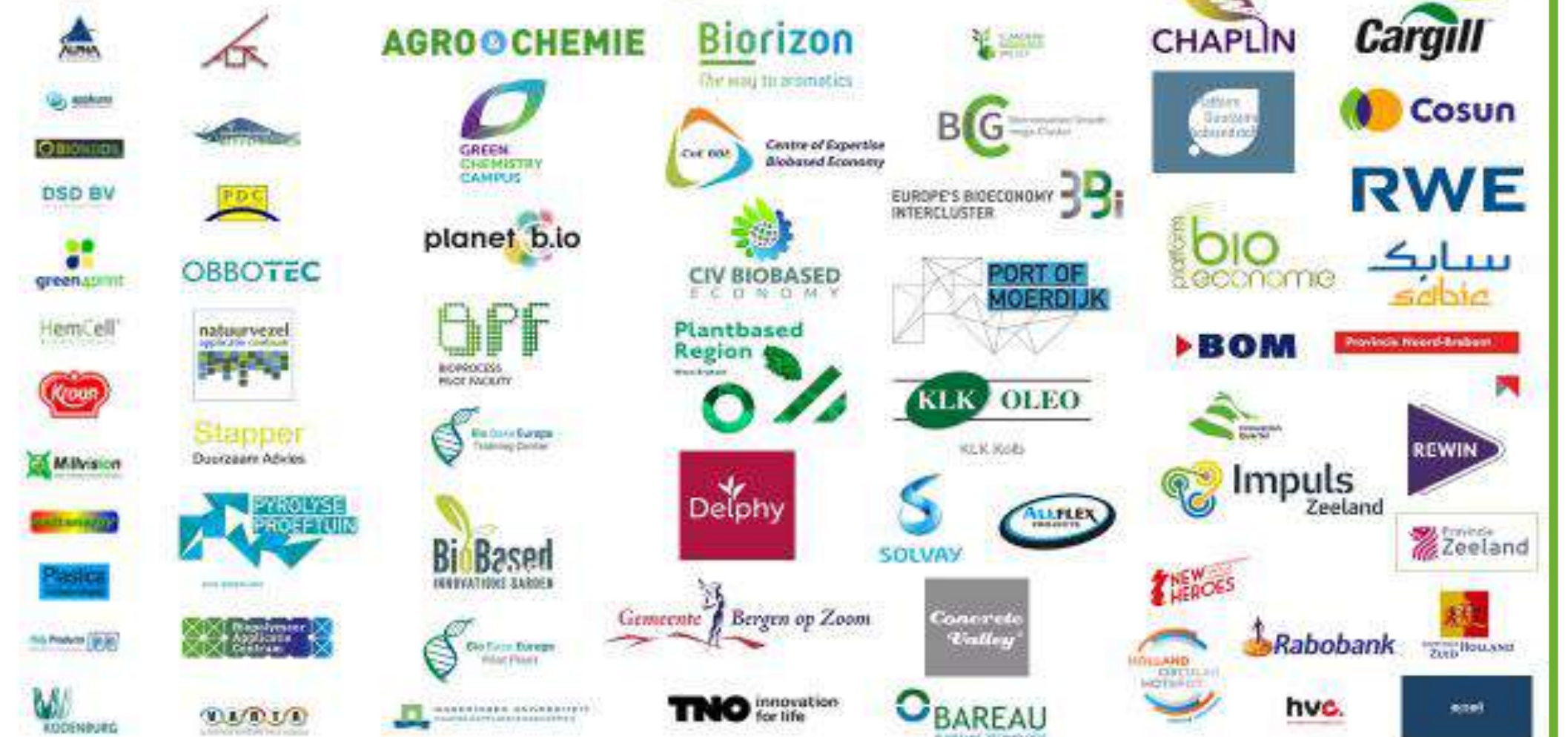
10+  
Overheids partners

10+  
Onderzoeks partners

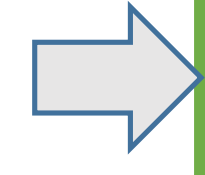
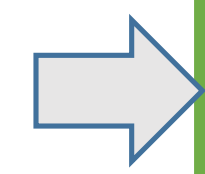
100+  
Projecten

10MT  
CO2 reductie per jaar

## CBBB partners in the execution agenda



# The goals and strategy of Circular Biobased Delta



- Green chemistry**
- Biogate EU
  - Bioaromatics
  - Bioplastics

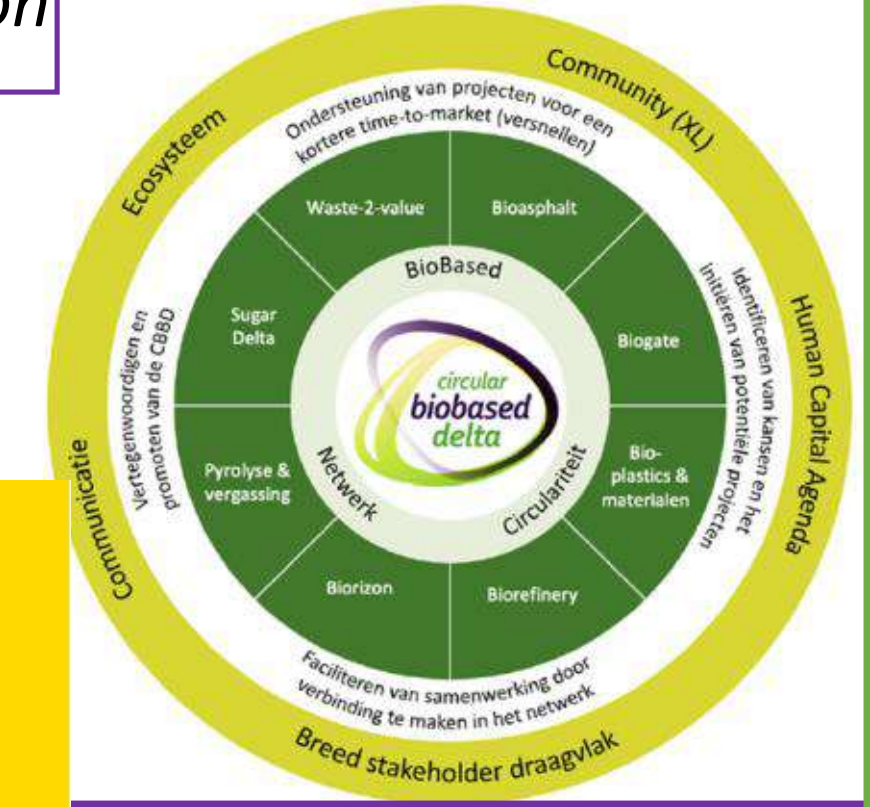
- Biofeedstock**
- Sugar Delta
  - Biorefinery
  - Chaplin

**4 Themes**

- Chemical recycling**
- Pyrolysis
  - Gasification
  - Depolymerisation

- Waste2value**
- CCU
  - Agro waste

**8 Programs**

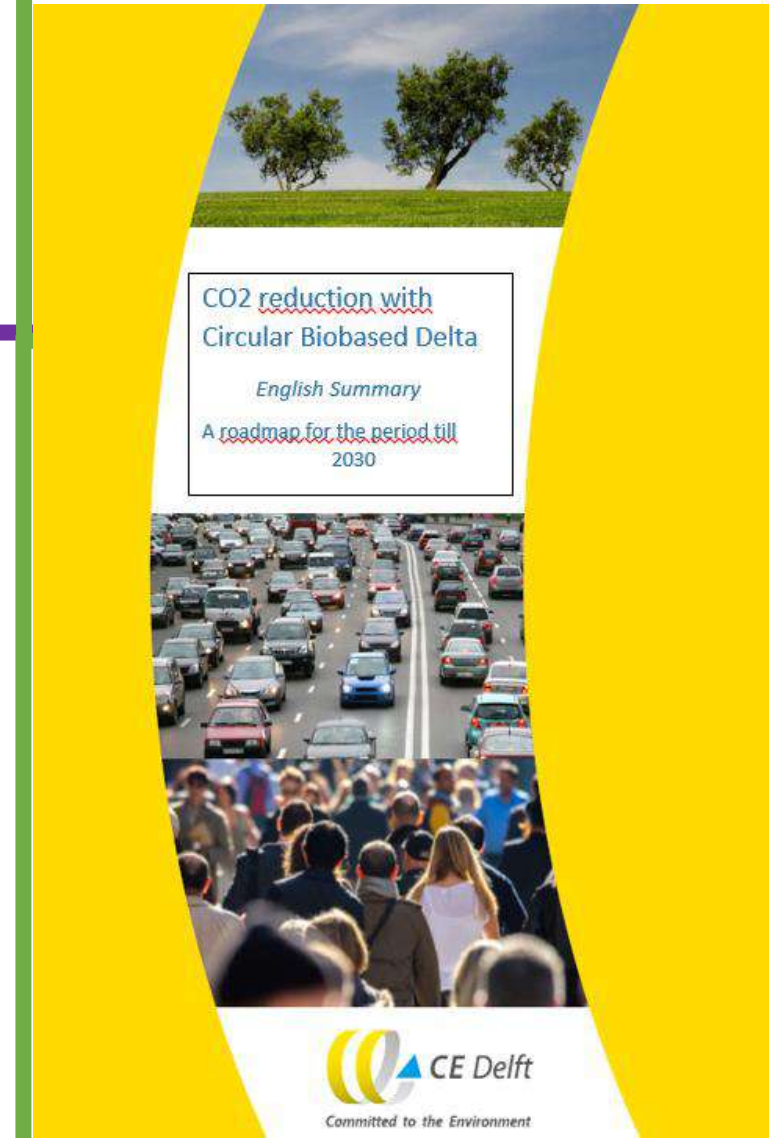


**Vision:** drive transition to circular biobased economy with stakeholders in the Delta region

**Mission:** accelerate biobased routes and circular solutions by creating new value chains

**Goal in 2030:** reduce 10 Megatons CO2-eq/year and double circularity to 50% average

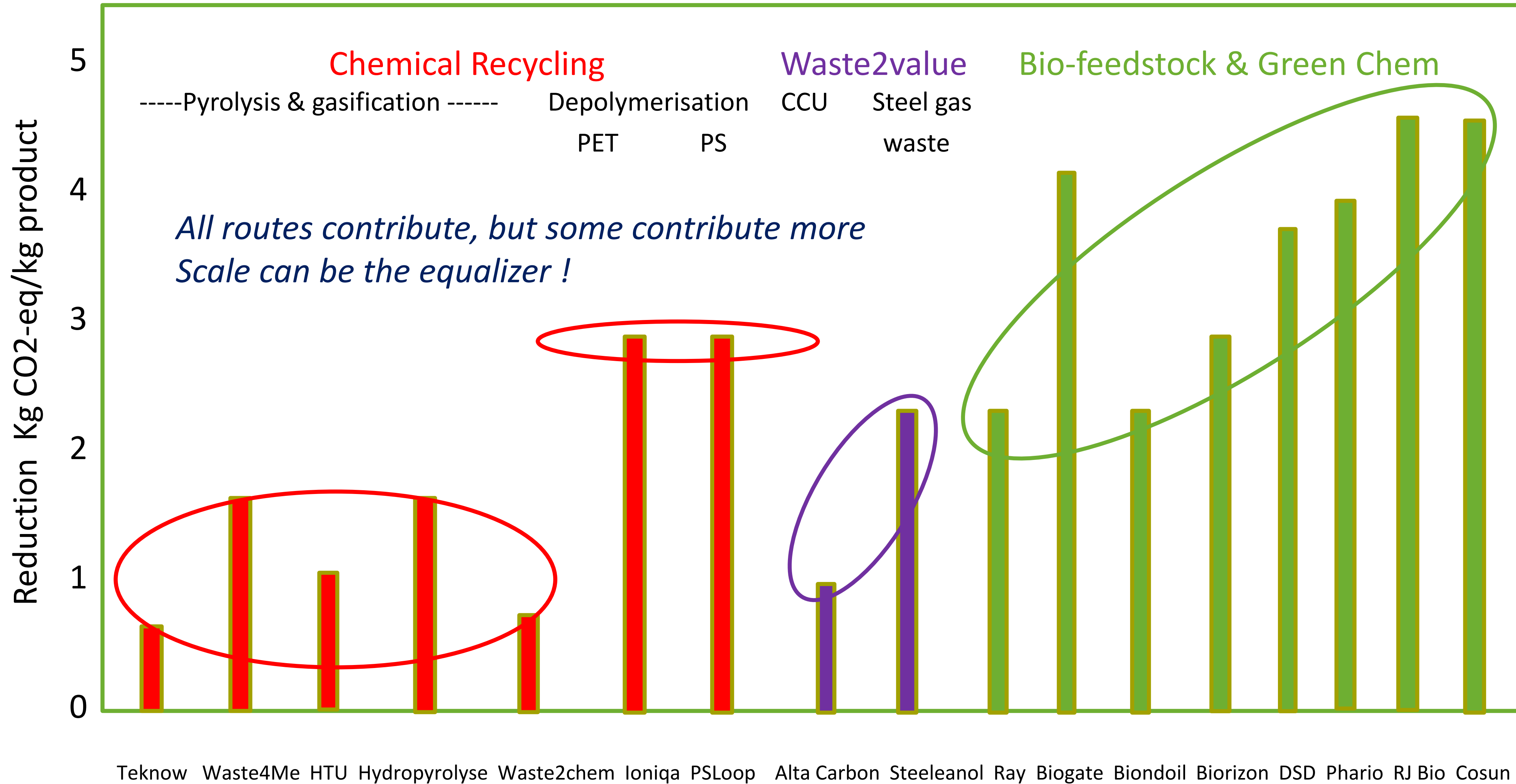
**Strategy:** develop project portfolio with stakeholders and roadmap by CE Delft for:  
IMPACT, TIMING, INTERDEPENDENCE, FEEDSTOCK DEMAND



**Key points:**

- 21 projects
- 90% SME
- >5 Mton CO2-eq
- LCA based
- Priorities
- Monitoring

# Impact of the various routes – corrected for scale



THANK YOU FOR YOUR ATTENTION

We are open to co-innovation, collaboration, new products and markets !



[WWW.BIOBASEDELTA.NL](http://WWW.BIOBASEDELTA.NL)

[CIRCULAR@BIOBASEDELTA.NL](mailto:CIRCULAR@BIOBASEDELTA.NL)

# Biobased Industries Consortium

**Dirk Carrez**

Executive Director, Bio-based Industries  
Consortium (BIC)





# The Bio-based Industries Consortium (BIC) – An introduction

Frontrunners of the BioCircular Economy 2.0—Nordic-Netherlands Roundtable, May 27, 2021

**Dirk Carrez**

*Executive Director, Bio-based Industries Consortium*



# BIC membership in figures

- > 240 industry members (large enterprises, SMEs and SMEs in clusters), including brand owners/ market actors
- *Sectors represented:* Agriculture, food & feed, Aquaculture and marine, Chemicals and materials, Forestry and pulp & paper, Market actors, Technology providers, Waste management & treatment
- > 200 associate members i.e. universities, RTOs, associations, etc.







- We connect industry, academia, regions and citizens to transform bio-based feedstocks into novel sustainable products and applications.
- We create circular bioeconomy ecosystems through investments, innovation and know-how.

Bio-based Industries Consortium

# BIC 2.0

## BUSINESS PLAN



The innovative, sustainable and competitive bio-based industry in Europe is the leader of a circular bio-society in Europe by 2050



We connect industry, academia, regions and citizens to transform bio-based feedstocks into novel sustainable products and applications, and create circular bioeconomy ecosystems through investments, innovation and know-how

# The BBI JU: a public-private partnership

# BBI JU: Partnership between industry (BIC) and EC



**BIO-BASED INDUSTRIES JOINT UNDERTAKING (BBI JU)**

# Bio-based value chains envisioned in the BBI Initiative

## Biomass and organic waste

### From the agro-based industries

- Feedstock originating from the agriculture and agro-food industries
- Agricultural crops such as flax, hemp and fibre
- Co-products, side streams, and residues from the agriculture, including animal manure and from the agro-food industries, including residues from food processing plants

### From the forest-based industries

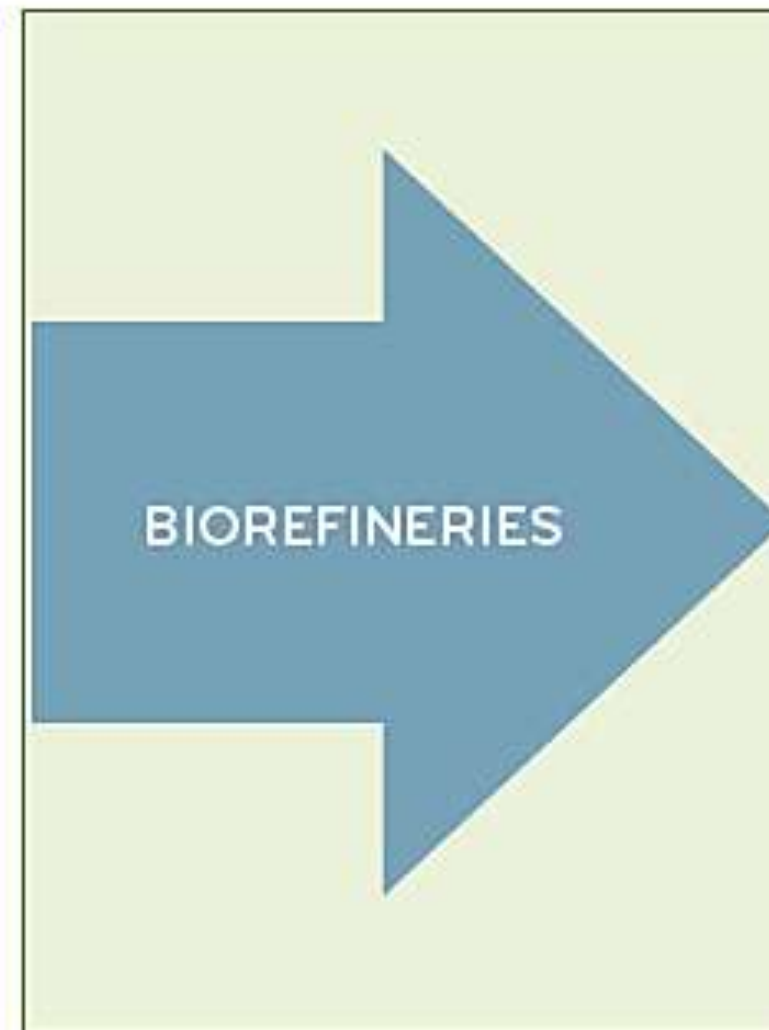
- Feedstock originating from the forest and forest-based industries
- 'Woody and non-wood forest feedstock'
- Co-products, side streams, and residues from the forest and forest-based industries, including the wood industry, saw mills, Paper and Pulp

### From the aquatic-based industries

- Feedstock originating from the aquatic and aquatic-based industries, including aquaculture, the fish and fish processing industries
- Co-products, side streams and residues from the aquatic and aquatic-based industries

### Bio-waste and CO<sub>2</sub>

- Biodegradable garden and park waste
- Food and kitchen waste from households, restaurants, caterers and retail premises
- Waste water and sludge
- CO<sub>2</sub>



## Bio-based products & markets

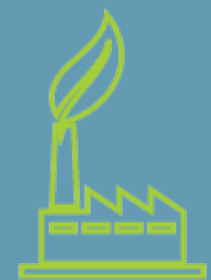
- Bio-based chemicals
- Bio-based plastics, polymers, materials, packaging
- Specialties (for example bio-based surfactants, lubricants, pharmaceuticals, nutraceuticals, cosmetics)
- Textiles
- Food ingredients and feed
- Advanced biofuels



Demonstration plants are represented by the locations that receive the main investment in the project



Flagship biorefinery



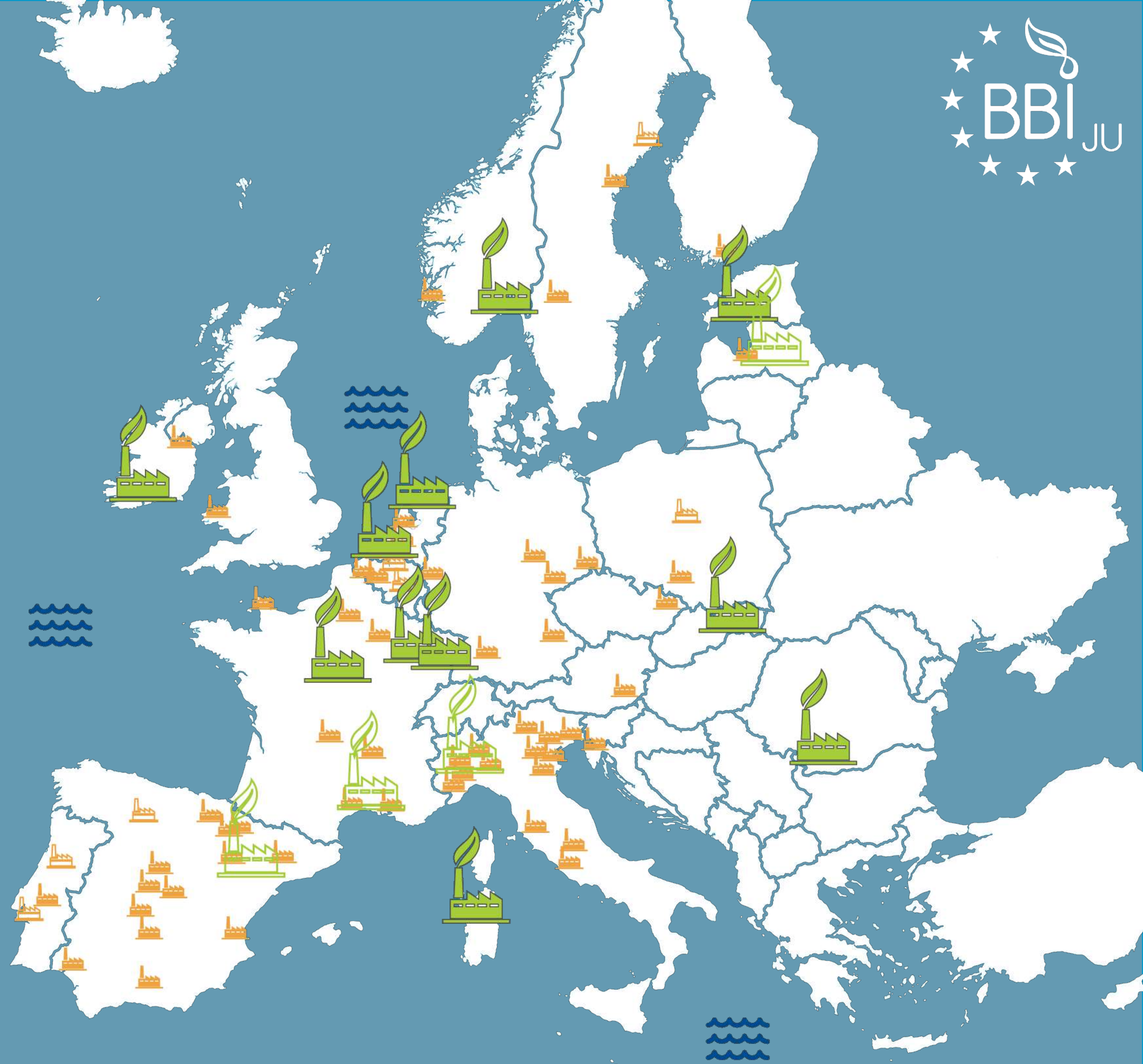
Expected flagship biorefinery Call 2020



Demonstration plant



Expected demonstration plant Call 2020



# From BBI to CBE

Announced by EC on February 23, 2021

## **Circular Bio-based Europe (CBE):**

This partnership will contribute significantly to the **2030 climate targets**, paving the way for climate neutrality by 2050, and will increase the **sustainability and circularity of production and consumption** systems, in line with the European Green Deal.

It aims to develop and expand the sustainable sourcing and conversion of biomass into bio-based products as well as to support the deployment of bio-based innovation at regional level with the active involvement of local actors and with a view to reviving rural, coastal and peripheral regions.

Thank you!

*dirk.carrez@biconsortium.eu*



# Roundtable discussion



**Monika Svanberg**

Project Manager, The Bioeconomy  
Regions in Scandinavia (BRS)



**Willem Sederel**

Chair, Circular Biobased Delta



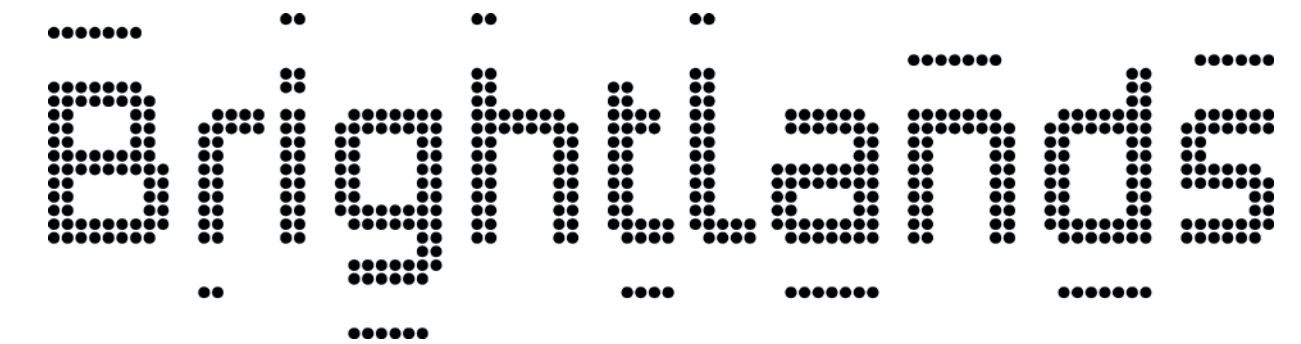
**Dirk Carrez**

Executive Director, Bio-based  
Industries Consortium (BIC)

# Brief presentations of Nordic and Dutch clusters, hubs and projects (second half)

# Brightlands Chemelot Campus's Circular Hub strategy (The Netherlands)

**Bert Kip**  
CEO, Brightlands Chemelot Campus



Brightlands

Knowledge crossing borders



**Leading  
Circularity**

Frontrunners of the BioCircular Economy 2.0—Nordic-Netherlands Roundtable  
May 27, 2021  
Bert Kip, CEO, Brightlands Chemelot Campus

Brightlands  
Chemelot Campus

Symposium

# Chemelot - the most sustainable, safe and competitive chemical site of Europe

A unique combination of chemical innovation power and chemical production experience



- 800 ha.
- Industrial Park
- 60 companies
- 8,000 employees
- > 60 nationalities
- 60 large-scale plants

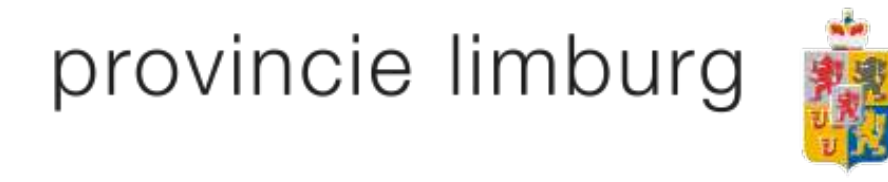


## Brightlands

- 30 ha.
- 100 organisations
- 3,000 employees
- 1,250 students
- Themes:
  - Sustainable Process Chemistry
  - Circular Materials
  - Biomedical Materials



# Chemelot Circular Hub – a coalition of industry site, campus, companies, research and educational institutions and governments



# Circular Economy Action Plan

## Circular Economy Action Plan

Chemelot Circular Hub's  
Transition Agenda

**C·C·H** Chemelot  
Circular Hub  
Leading Circularity

### Four development programs

#### 1. Circular Investments, Innovations and Applications

Strengthening innovation, acquisition and entrepreneurship

#### 2. Circular Competences

Investing in people, building on talent of all ages and levels

#### 3. Circular Fundament

Security of circular supply (waste and bio residual streams), logistics, sustainable energy/green electricity), infrastructure

#### 4. Circular Society

Developing surrounding cities and regions into leading circular testing grounds to improve physical and social living environment.

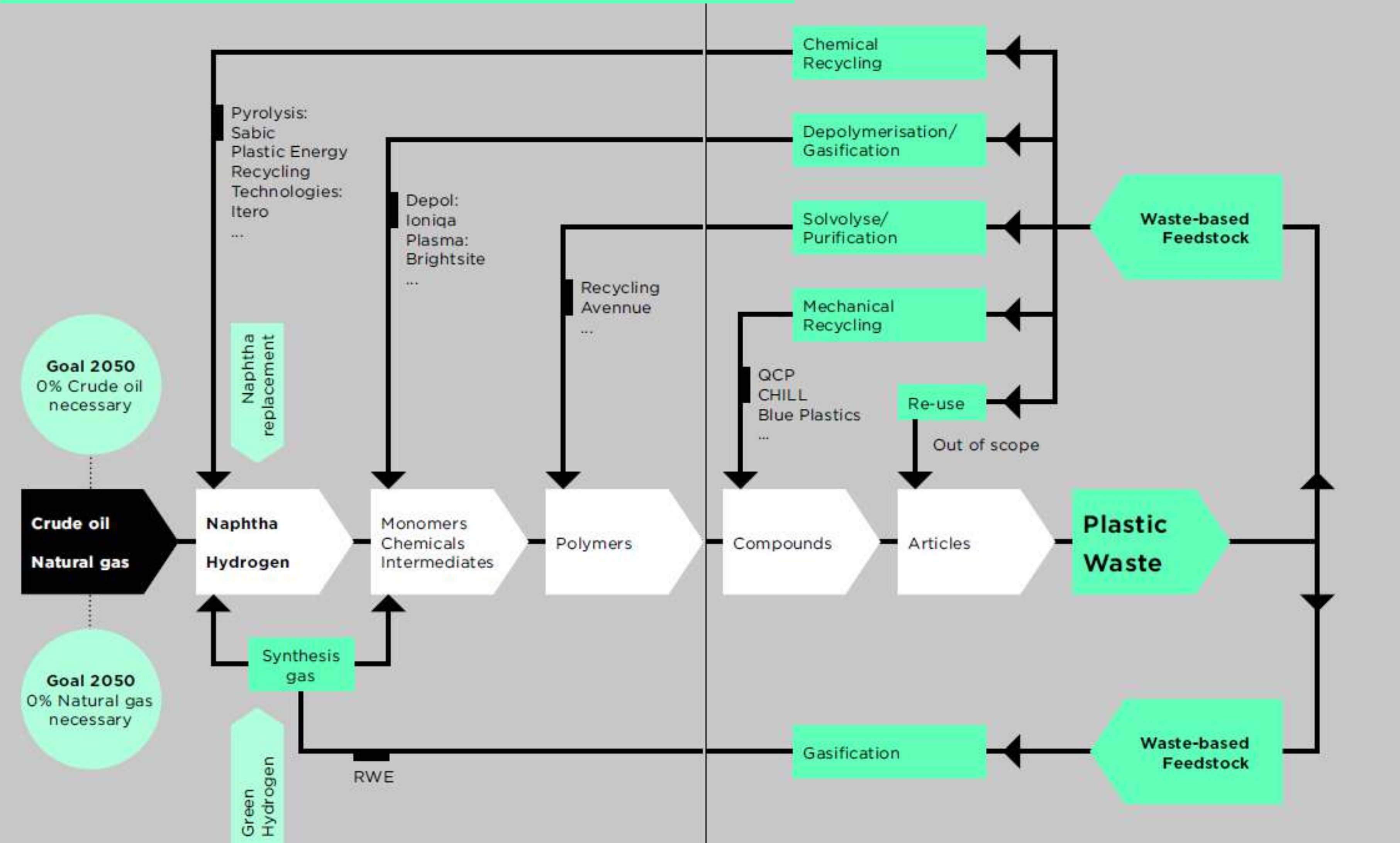
Feedstock transition

Energy transition

Cooperation transition

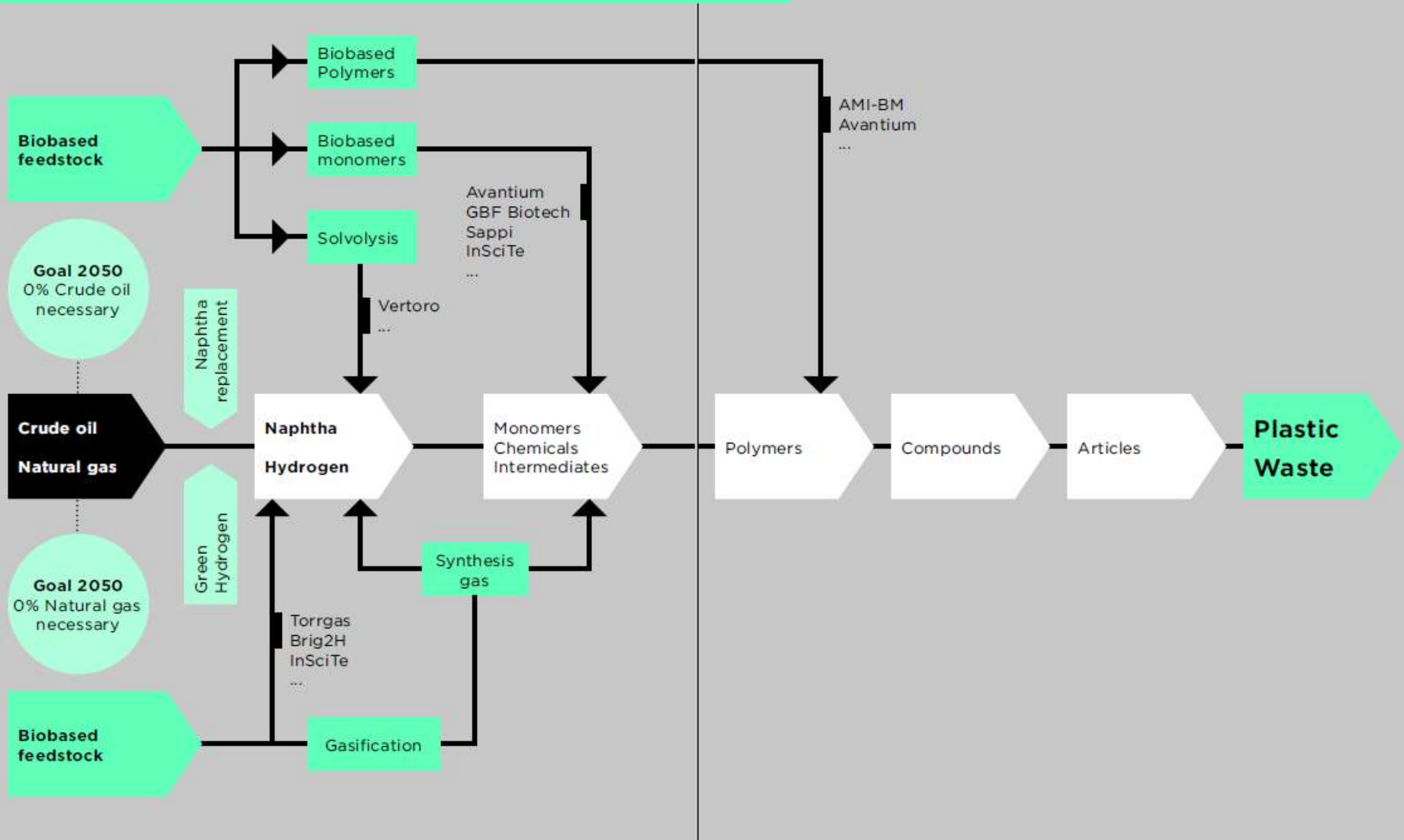
**C·C·H** Chemelot  
Circular Hub

# Plastic Waste as Feedstock





# Biomass as Feedstock



# Innovation Program Chemelot Circular Hub

## Sustainable Chemical Processes

Sustainable Carbon and Hydrogen  
Rest streams as new feedstock  
Biobased  
Electrification

## Circulaire Materials en Products

Designed-to-recycle  
Biobased  
Lifetime and Functionality

1. Attracting new technologies at Chemelot Industrial Park – First-in-kind plant

2. Attracting new technologies at Brightlands Chemelot Campus – Pilots & Demonstrators

3. Upscaling of new technologies in research centers

**Brightsite**  
Transforming industry

**Brightlands  
Materials Center**



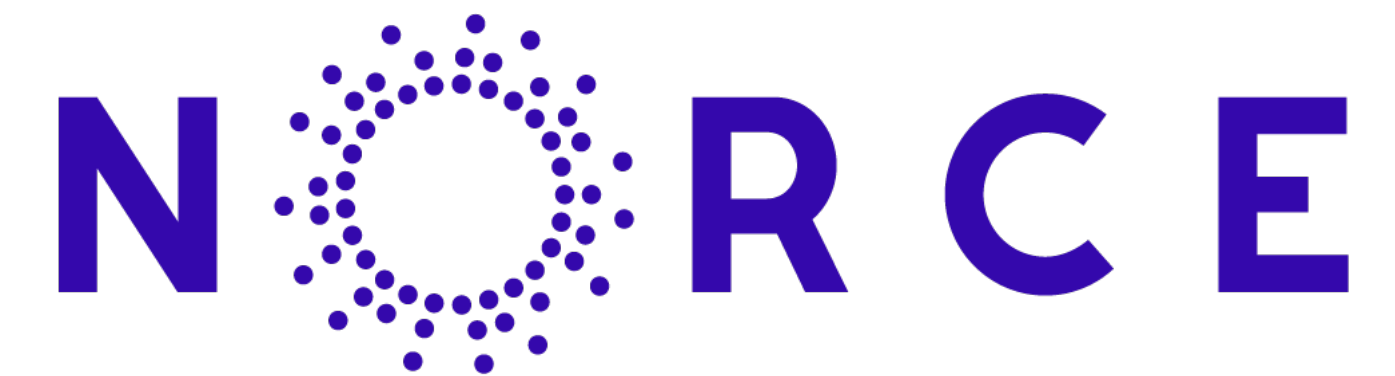
# Chemelot Circular Hub in pole position

- Unique innovation ecosystem
- Most productive chemistry cluster in NL
- Strategic position in Europe - ARRRA Cluster  
(Antwerp-Rotterdam-Rhine-Ruhr Area)
- Tradition in transition
- Well on our way...



# Renewable carbon for circular aquaculture growth

**Dr. Hans Kleivdal**  
Executive Vice President,  
NORCE Norwegian Research Centre AS



# Renewable carbon for circular aquaculture growth

*- stimulating biocircular economy innovation and industry  
development*

Frontrunners of the BioCircular Economy 2.0—Nordic-Netherlands Roundtable,  
May 27, 2021

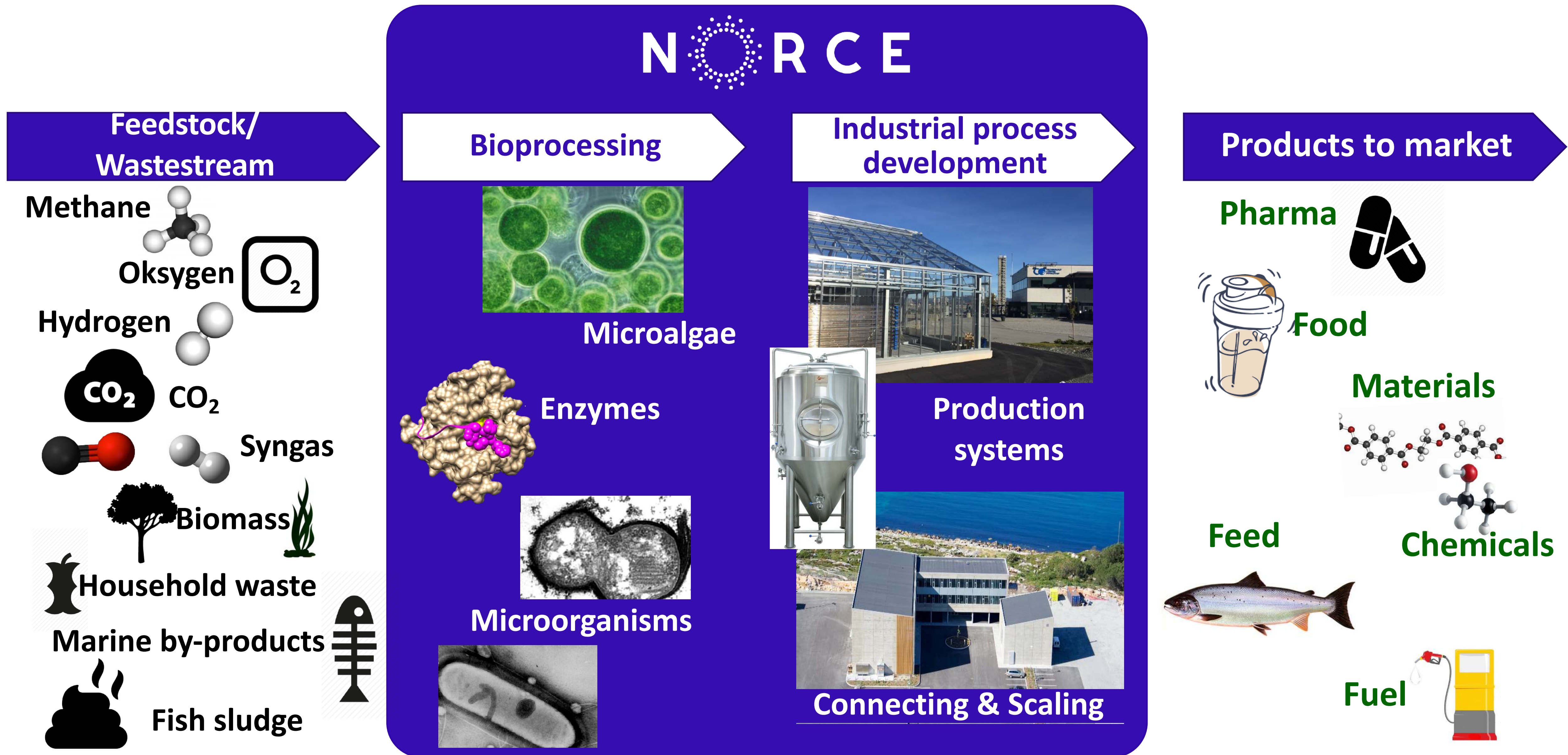
*Dr. Hans Kleivdal*

*Executive Vice President*

*NORCE Norwegian Research Centre AS*



# Collaborating to develop biocircular value chains



# The Blue Bioeconomy must also become circular

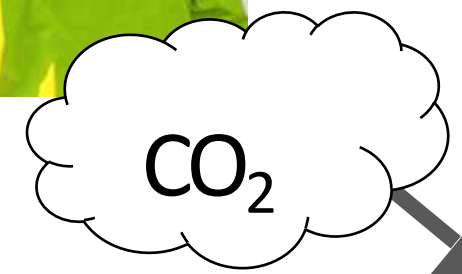
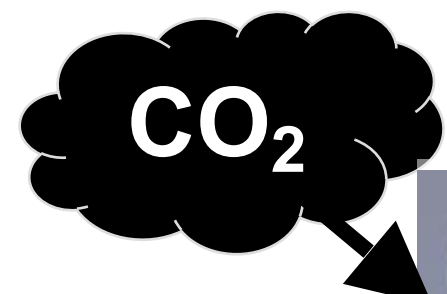
## **Bottleneck for salmon industry:**

- **Salmon feed not sustainable**  
Soy, fish meal and oils represent 80% of salmon CO<sub>2</sub> footprint
- **Polluting fish sludge** released from open sea pens affects the environment and ecosystems





# Biocircular fish feed from CO<sub>2</sub> and waste



Insects

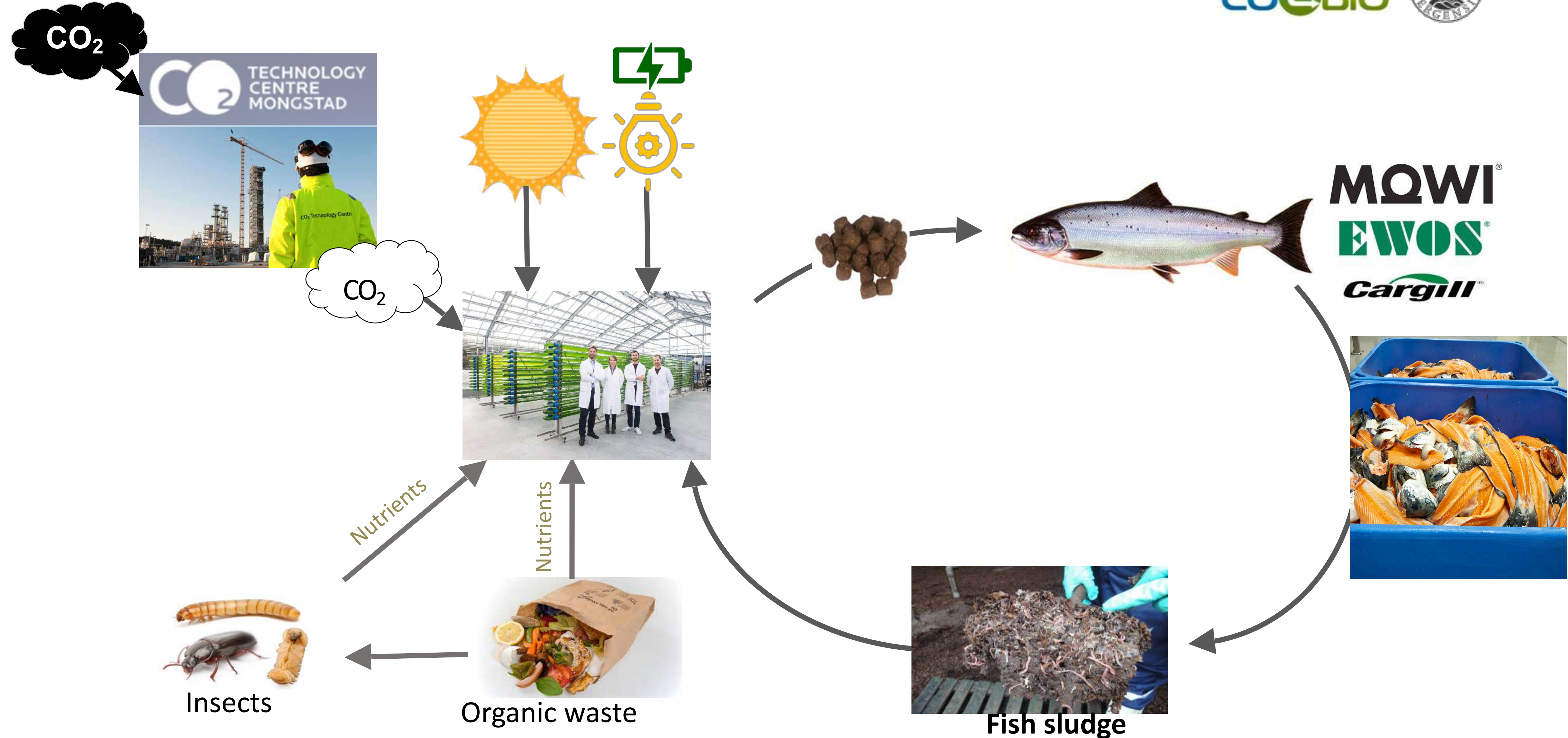


Organic waste

Nutrients

Nutrients

Fish sludge



# Biorefinery; odourless and tasteless protein meal from fish off-cuts

- **Specialised industrial enzymes** are the key biorefinery tools
- Enzymes **convert waste to high-value products** by degrading or modifying the fish proteins
- Odour- and tasteless fish protein expands the market radically



taste

smell

Foto: Øyvind G. Eknes

# PyroCO<sub>2</sub>

## Demonstrating the scaled conversion of industrial CO<sub>2</sub> to chemicals

- **Potential game changer** for carbon-intensive industries
- EU Green Deal project (SINTEF)
- NORCE; develop pre-pilot
- Total EUR 44 million (2021-2025)

NORCE



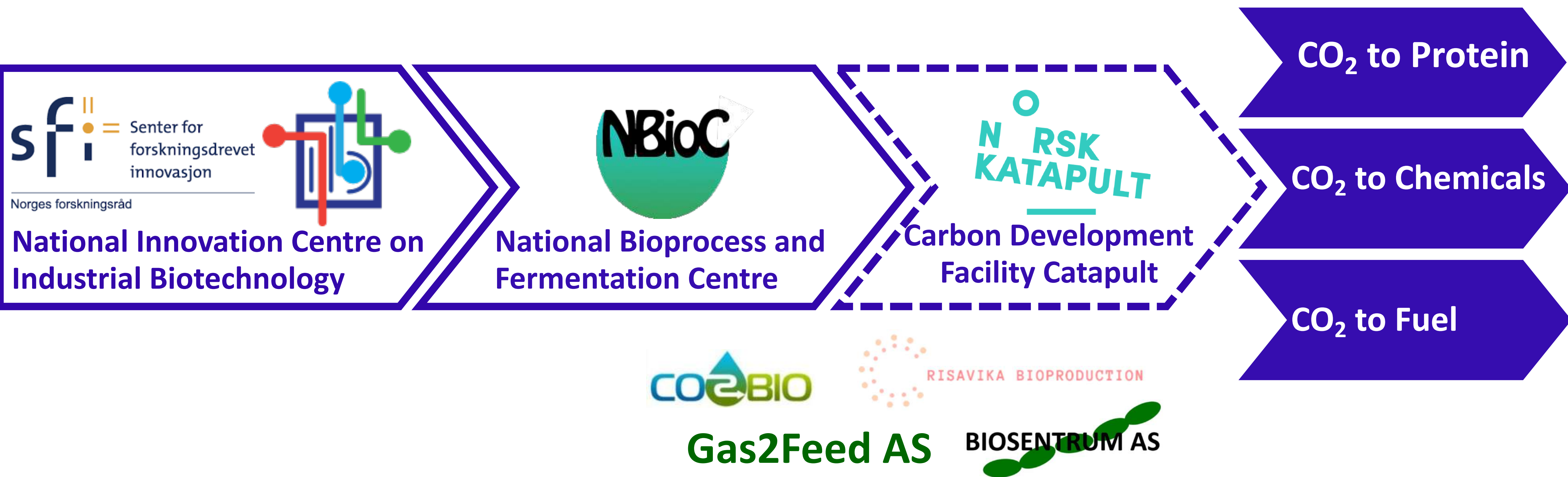
# Development of CO<sub>2</sub>-based value chains



Research & Innovation

Connect & Scale

Industrial Pilots  
to Validate



# European Circular Economy Stakeholder Platform

## Dr. Agnieszka Szyk

President of the Board, INNOWO; member of  
the Coordinating Group and Leader of the Food  
Waste, Food System and Bioeconomy  
Leadership Group, ECESP



# European Circular Economy Stakeholder Platform



#CEStakeholderEU

## Accelerating the transition towards a circular economy in Europe: European Circular Economy Stakeholder Platform

*Frontrunners of the BioCircular Economy 2.0—Nordic-  
Netherlands Roundtable, May 27, 2021*

**Dr. Agnieszka Szyk**

Leader of the Food Waste, Food System and  
Bioeconomy Leadership Group, ECESP

# European Circular Economy Stakeholder Platform



#CEStakeholderEU

## What is it?

- A joint initiative supported by the European Economic and Social Committee (EESC) and the European Commission
- A European stakeholder-led platform to foster the debate about the circular economy
- A “network of networks“ bringing together stakeholders active in the broad field of the circular economy across Europe
- A virtual one-stop shop providing a library of knowledge and a forum for interaction
- A stimulus to civil society, public authorities and private organisations to exchange best practice across countries and sectors—through meetings, conference and virtually



# European Circular Economy Stakeholder Platform



#CEStakeholderEU

## FOOD WASTE, FOOD SYSTEM AND BIOECONOMY LEADERSHIP GROUP

### Priority areas

food, bio-based products and agriculture

1. Governance and system change
2. Urban food system transformation
3. Food waste and resource efficiency

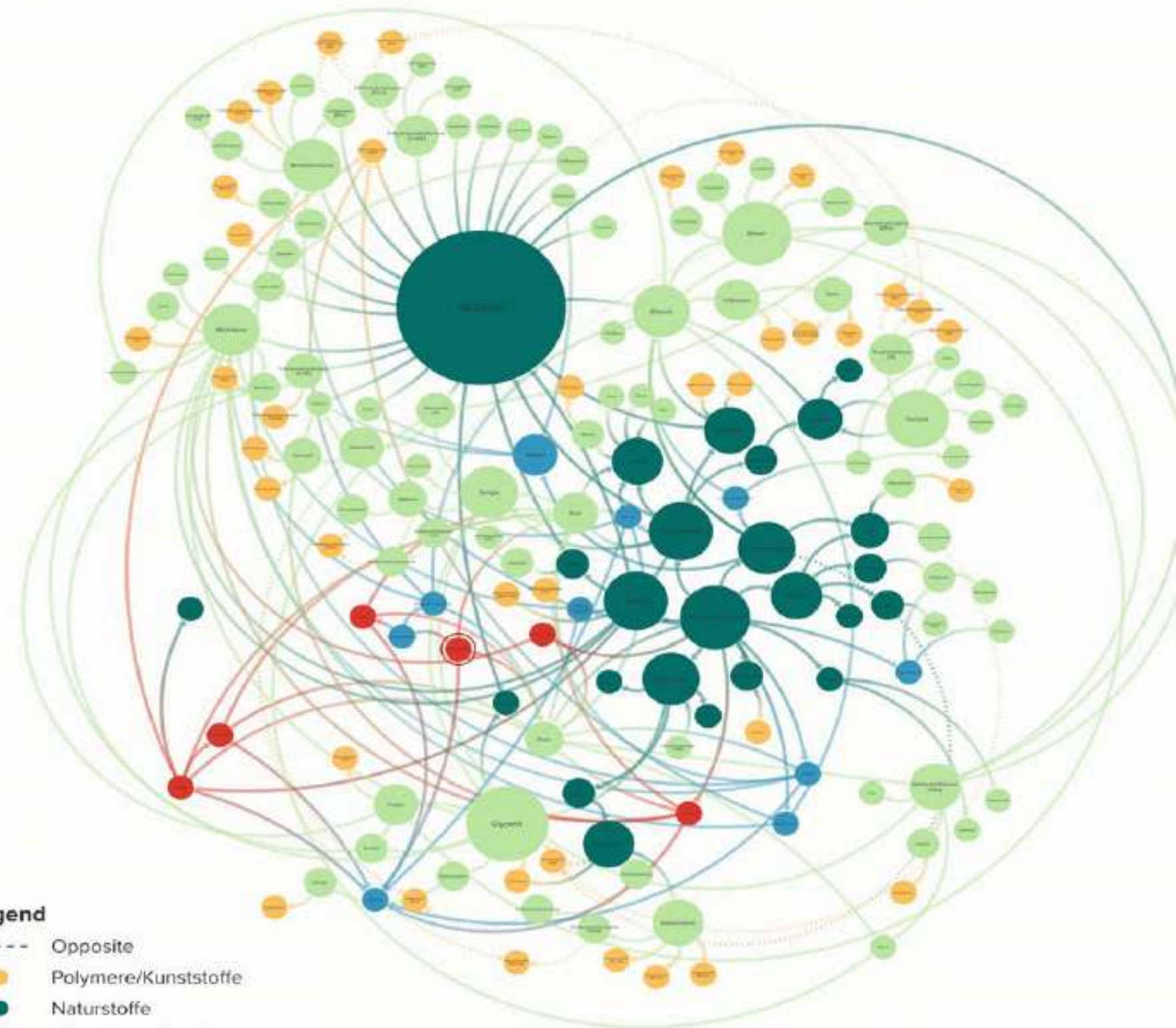
#EUCircularTalks





#EUCircularTalks

# Chemical pathways



- Legend**
- Opposite
  - Polymere/Kunststoffe
  - Naturstoffe
  - Chemische Grundstoffe
  - Industrielle Nebenprodukte
  - Monomere
  - Abfall

[www.kumu.io/alcn/austrian-biocycles](http://www.kumu.io/alcn/austrian-biocycles)

*Austrian BioCycles: secondary biomass streams and potential exploitation through decentralised and connected biorefineries*  
<https://circulareconomy.europa.eu/platform/sites/default/files/austrian-biocycles.pdf>



# European Circular Economy Stakeholder Platform



#CEStakeholderEU

*There are currently 15,000+ marketable bioproducts in five broad classes: biochemicals, biopolymers, bioadhesives, biomedicines, and biopesticides*

*Main challenge: the effective integration of biofuel and bioproducts production, which requires technological and financial support and life cycle assessment-based planning*

- *Source: Shan Gao, Weiping Song and Mingxin Guo. The Integral Role of Bioproducts in the Growing Bioeconomy. <https://www.liebertpub.com/doi/10.1089/ind.2019.0033> Published in Industrial Biotechnology, vol. 16, no. 1, February 13, 2020*



**Top emerging  
bio-based products,  
their properties  
and industrial  
applications**

# European Circular Economy Stakeholder Platform






#CEStakeholderEU

*The HOOP project: eight lighthouse cities and regions are blazing the trail for urban circular bioeconomy solutions (including Almere, The Netherlands, Kuopio, Finland and Bergen, Norway)*

**hoop**

## Vitalise Europe's Urban Bioeconomy

The HOOP project supports 8 lighthouse cities and regions in developing large-scale urban circular bioeconomy initiatives that will focus on recovering valuable resources from urban biowaste and wastewater to make bio-based products.

Discover   

Email address...

I agree to the [terms and conditions](#)

<https://hooproject.eu/>

# European Circular Economy Stakeholder Platform



#CEStakeholderEU

## Directions

- *Strong cross-sectoral collaboration network*
- *Cities as bioeconomy hotspots*
- *Operative experience through pilot projects*
- *Build a nutrient resilient economy*
- *Reimagine and redesign the food system*
- *Food hubs*
- *Biomass – local biorefineries*

# European Circular Economy Stakeholder Platform



#CEStakeholderEU

## How can stakeholders get involved?

### Best practice:

- **Search** for existing ones
- **Submit** yours directly

### Policy dialogue:

- **Reach out** to Coordination Group members directly
- **Contact** the Secretariat (EESC)
- Attend the annual conference
- **Join** the conversation on the forum

### Sharing knowledge:

- **Search** for published reports
- **Browse** adopted strategies
- **Share** your knowledge directly

- Dr. Agnieszka Sznyk, [a.sznyk@innowo.org](mailto:a.sznyk@innowo.org)
- Secretariat: [CEStakeholderEU@eesc.europa.eu](mailto:CEStakeholderEU@eesc.europa.eu)
- Twitter: @CEStakeholderEU – continue the conversation using #CEStakeholderEU
- LinkedIn: [company/eceesp/](https://www.linkedin.com/company/eceesp/)

# European Circular Economy Stakeholder Platform



#CEStakeholderEU

Thank you!

#CEStakeholderEU  
#EUCircularTalks

<https://circulareconomy.europa.eu/>

# Roundtable discussion



**Bert Kip**

CEO, Brightlands Chemelot Campus



**Dr. Hans Kleivdal**

Executive Vice President, NORCE Norwegian  
Research Centre AS



**Dr. Agnieszka Szyk**

President of the Board, INNOWO;  
member of the Coordinating Group and  
Leader of the Food Waste, Food  
System and Bioeconomy Leadership  
Group, ECESP

# Reflections and some recommendations

**Prof. Emmo Meijer**

Chair, ChemistryNL (Dutch Top Sector for Chemistry), Chair, EIT RawMaterials/ERMA (European Raw Materials Alliance) and emeritus part-time Professor, Eindhoven University of Technology







**Thank you and hope to see you  
during the digital lunch  
(12:10–13:00 CEST)**



# Digital lunch

**Meet the Nordic Circular Hotspot's Managing Partners, liaise with some of the roundtable speakers and have lunch virtually**

# Frontrunners of the BioCircular Economy 2.0

