



## Driving SME Sustainability and Circular Innovation: Strategies, Tools, and Advocacy for a Resilient Future

2<sup>nd</sup> Workshop

03.04.2025



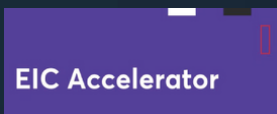
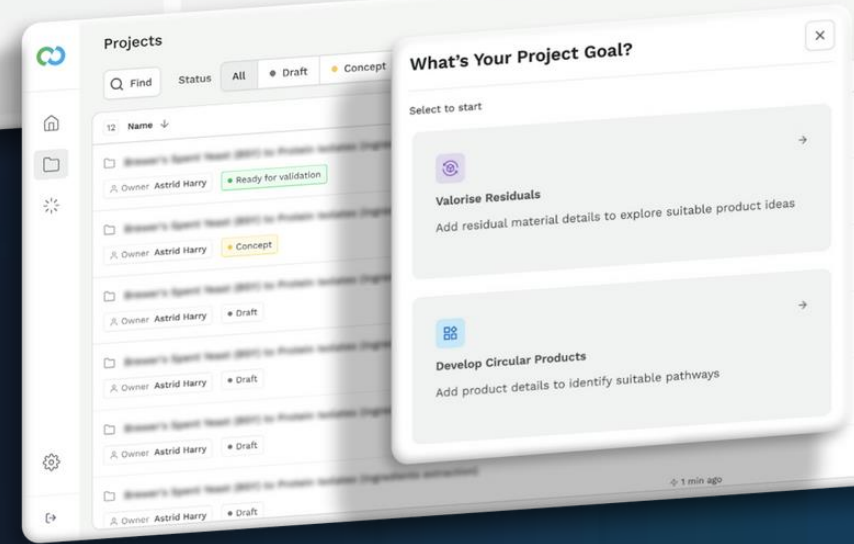
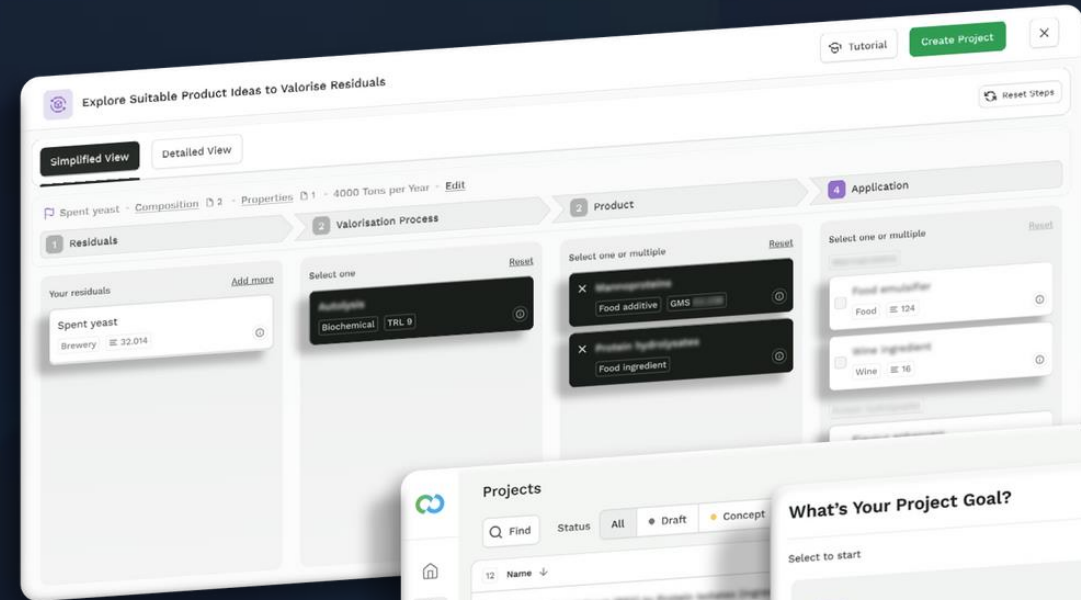
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VALUE CHAIN GENERATOR

# AI development of circular & biobased products and business models

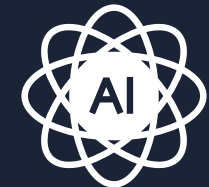


# DEVELOP TECHNICALLY FEASIBLE & PROFITABLE CIRCULAR INDUSTRY SOLUTIONS

AI to develop circular solutions and business opportunities based on the latest technological and scientific advances combined with material, market, and feedstock availability intelligence.

## A COMPETITIVE EDGE WITH SPECIALISED AI

Leveraging more than 5 million of the latest patents, technologies, scientific publications, market reports, LCAs, and specialised data sources, you can realise circularity with global intelligence at your fingertips.



### 1. SIDE STREAM VALORISATION

#### SOLUTION EXAMPLE

VCG.AI enables a multinational brewery to get 6x the value for their side stream compared to the existing market outlet.

### 2. PRODUCT DEVELOPMENT

#### SOLUTION EXAMPLE

VCG.AI enables a chemical company to develop and launch new bio-based products to diversify its product portfolio.

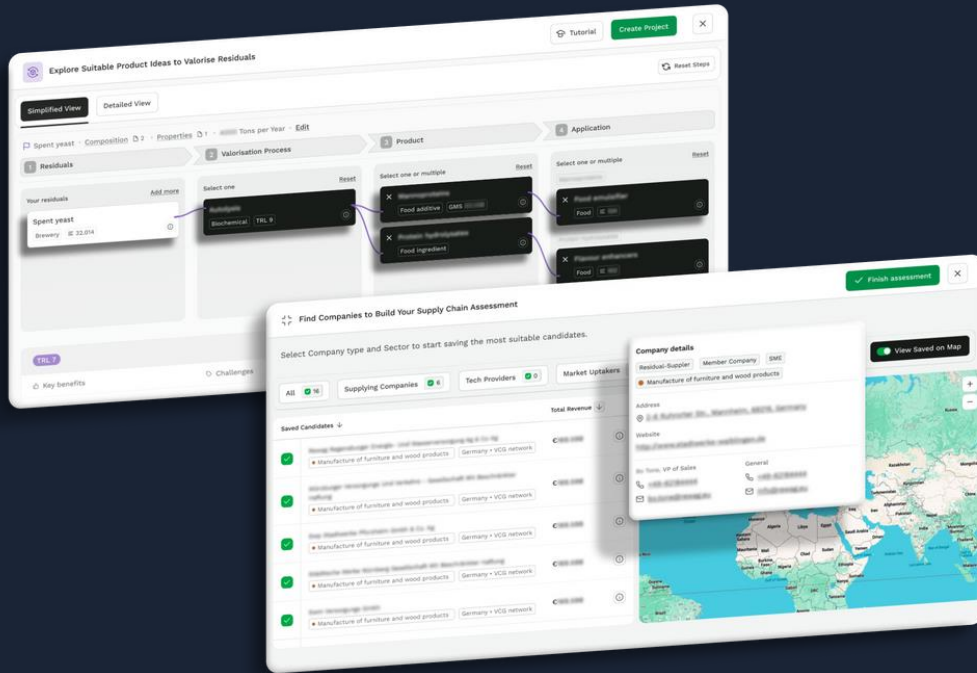
### 3. FEEDSTOCK SOURCING

#### SOLUTION EXAMPLE

VCG.AI enables project implementation through reliable feedstock sourcing, meeting quantity & quality requirements.

# THE INTELLIGENCE BEHIND GLOBAL CIRCULARITY

## OVERVIEW OF VCG.AI SOLUTIONS



## OUTLINE

### 1. INTELLIGENCE BEHIND CIRCULAR OPPORTUNITIES

- 1.1 Analysis and Live Monitoring of the Technology Landscape
- 1.2 Overview of Pilot, Demonstration, and Industrial Plants
- 1.3 Patent Landscape Assessment
- 1.4 Scientific Publications and R&D Projects
- 1.5 VCG.AI Roadmap (Upcoming Features)

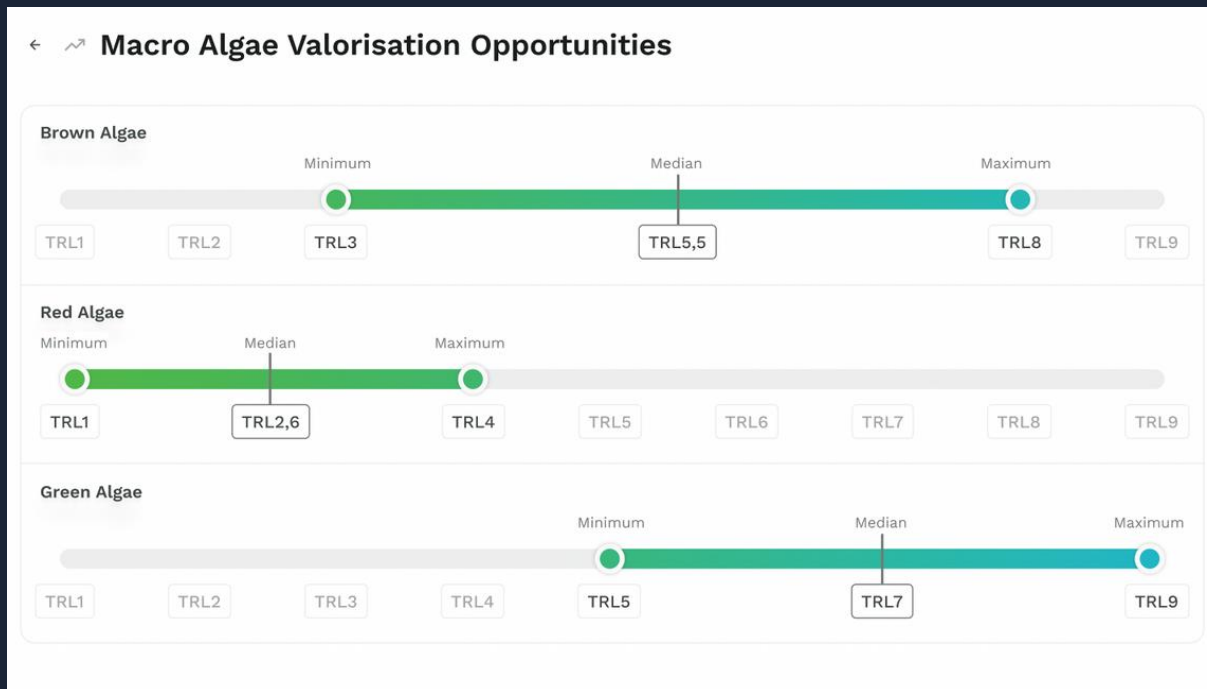
### 2. TECHNICAL VALUE CHAIN SOLUTIONS

- 2.1 Feedstocks and Sidestreams
- 2.2 Valorisation Processes
- 2.3 Product Development
- 2.4 Market Applications

### 3. MARKET DEVELOPMENT AND FEEDSTOCK SOURCING

# 1. INTELLIGENCE BEHIND CIRCULAR OPPORTUNITIES

## 1.1 ANALYSIS AND LIVE MONITORING OF TECH LANDSCAPE



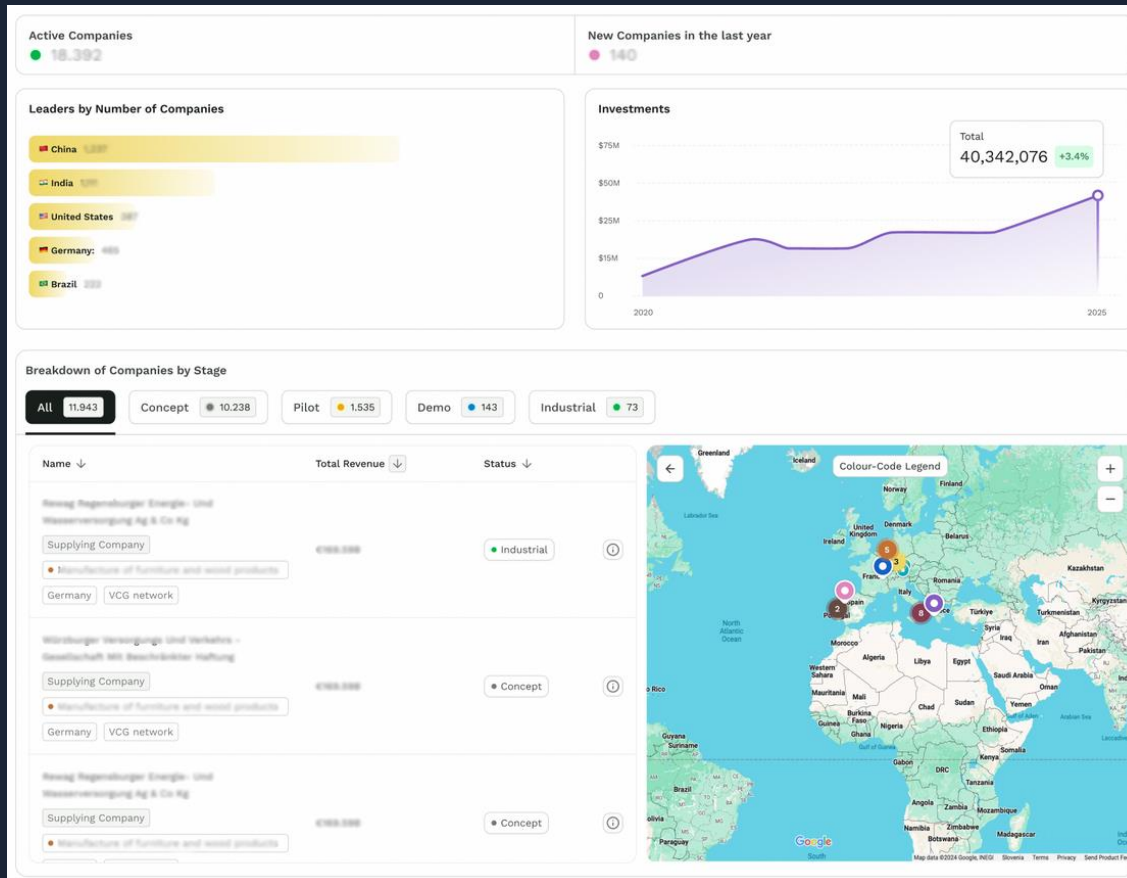
Exemplary

## Assessing Technology Readiness and Market Potential

- **Evaluate technology maturity** across feedstocks, processes, products, applications to identify readiness levels and business opportunities.
- **Conduct multi-level analysis** of technology trends, integrating macro and micro perspectives for a comprehensive understanding.
- **Leverage real-time monitoring** with access to continuously updated background data (weekly updates).

# 1. INTELLIGENCE BEHIND CIRCULAR OPPORTUNITIES

## 1.2 OVERVIEW OF PILOT, DEMO AND INDUSTRIAL PLANTS



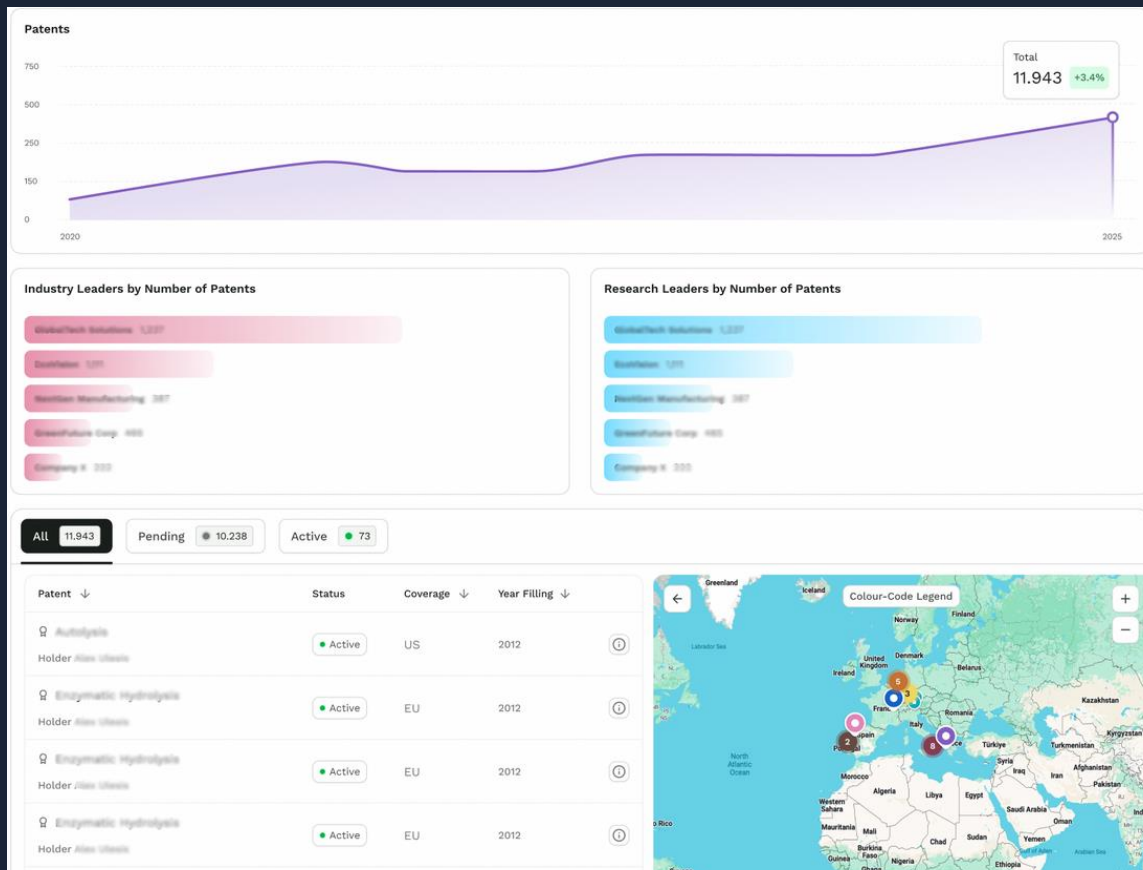
## Tracking Investments and Technology Advancements

- **Map pilots, demonstration and industrial-scale plants** to assess commercialization progress.
- **Analyze key players**, including technology developers, processors, and investors, to understand the market landscape.
- **Monitor plant development** to mitigate investment risks and anticipate emerging opportunities.

Exemplary

# 1. INTELLIGENCE BEHIND CIRCULAR OPPORTUNITIES

## 1.3 PATENT LANDSCAPE ASSESSMENT



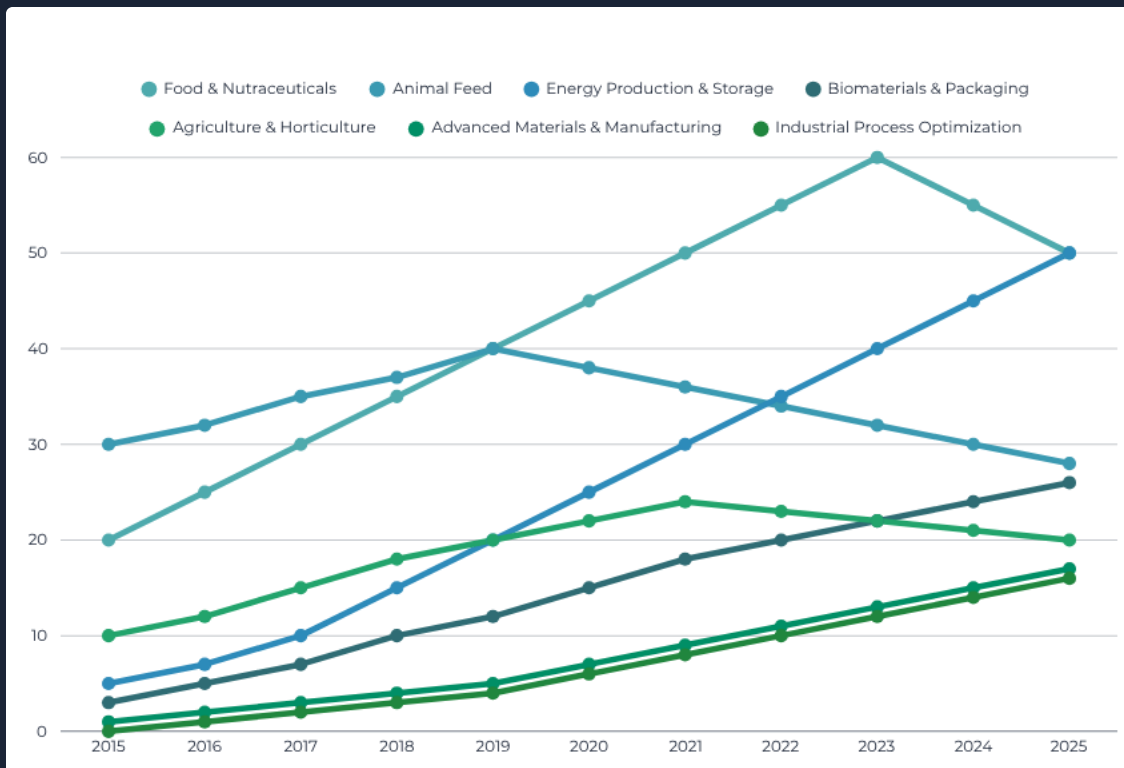
## Monitoring the Global Intellectual Property (IP) Landscape

- **Track patent trends** across processes, products, and applications to uncover innovation hotspots.
- **Identify leading technology developers** across industries and research institutions.
- **Assess geographic patent coverage** to determine market entry and protection strategies.

Exemplary

# 1. INTELLIGENCE BEHIND CIRCULAR OPPORTUNITIES

## 1.4 SCIENTIFIC PUBLICATIONS AND R&D PROJECTS



Exemplary

### Monitoring Global Research and Innovation Trends

- **Analyse publication and project trends** in feedstocks, processes, products, and applications to predict the future advancements.
- **Assess industry participation** in research projects to map the competitive landscape.
- **Identify top research institutions** and **latest R&D breakthroughs** to leverage emerging technologies.

# 1. INTELLIGENCE BEHIND CIRCULAR OPPORTUNITIES

## 1.5 VCG.AI ROADMAP (UPCOMING FEATURES)



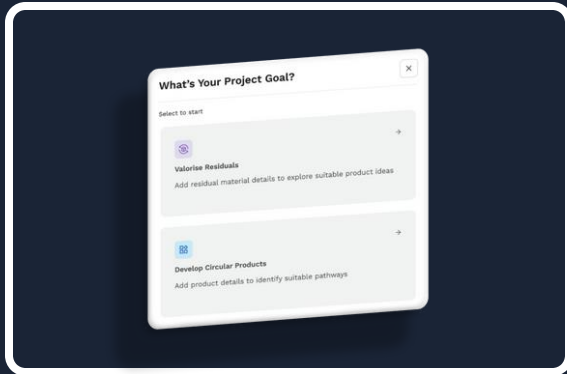
### IDENTIFY AND MONITOR HIGH-POTENTIAL STARTUPS & SCALEUPS

- **Assess total investments and active companies** to understand the competitive landscape.
- **Monitor individual company progress**, including funding, milestones, and scale-up stage (concept to industrial scale).
- **Track emerging trends** in feedstocks, technologies, products, and applications to identify strategic opportunities.

### STAYING AHEAD WITH INDUSTRY INTELLIGENCE

- **Track major industry investments** and projects to monitor competition & anticipate market shifts.
- **Identify key market trends** shaping the future of feedstocks, technologies, and applications.
- **Stay informed with real-time updates**, including press releases and industry news, to maintain a competitive edge.

# USE CASE: CIRCULAR CHEMICALS



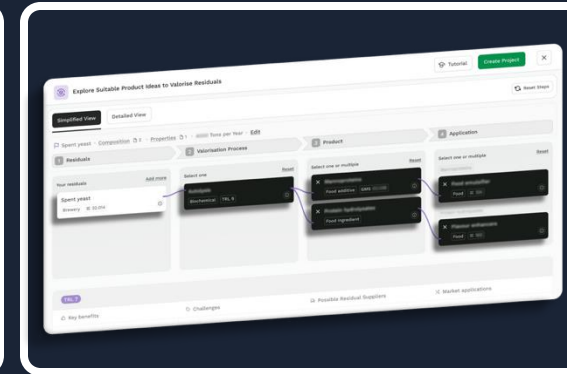
## 1. CHOOSE YOUR STARTING POINT

A company engaged VCG.AI to explore the potential for **sourcing and manufacturing Ethylene Glycol (EG)** in a more **circular way**. EG is used among others for PET production.



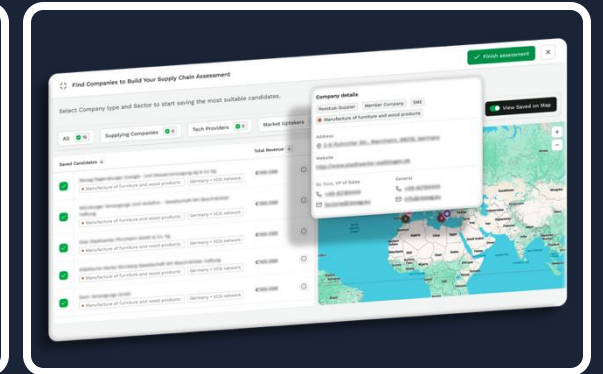
## 2. ANALYSE THE LANDSCAPE

VCG.AI conducted an effective landscape analysis covering **emerging technologies, patents, R&D developments, and commercialization trends** across both startups and established industry players.



## 3. DISCOVER THE SOLUTIONS

Through technical value chain mapping, VCG.AI identified **seventeen** distinct valorisation processes and mapped **forty-seven viable feedstocks**, leading to **nine end-use markets** relevant to EG.



## 4. DEEP DIVE ASSESSMENTS

A deep dive into each stage of the value chain uncovered **key data on technology readiness levels**, process yields, feedstock characteristics, **market pricing, suppliers and off-takers, and other commercialisation factors**.

Exemplary

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# PROJECTS IN DEVELOPMENT

## SUPPORTING THE SCALE UP OF SOLUTIONS

VCG.AI has partnered with a European project development company to **deploy 10 billion EUR into projects focused on renewable feedstocks by 2035.**



We handle the CAPEX and project execution to de-risk and scale up production according to the needs of the market.

### SOUTH EAST EUROPE

Feedstock

**Brewer's spent yeast**

Technology

**Mechanical separation & ingredient extraction**

Products

**Active peptides &  $\beta$ -glucans**

CAPEX

**€45-50 Million**

### SOUTH EAST EUROPE

Feedstock

**Dairy side streams**

Technology

**Membrane separation & ultrafiltration**

Products

**Proteins & pharmaceuticals, lactose**

CAPEX

**55-60 mio EUR**



# PARTNERS & CLIENTS

## EUROPE AND BEYOND



**F&B  
Company**



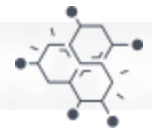
**Chemical  
Company**



**Retail  
Chain**



**Global  
Brewery**



**Fertilisers  
Producer**



**15 countries**

where VCG.AI is already deployed

**+300,000 tonnes**

of renewable feedstock sourced for  
projects already in development

# THE TEAM BEHIND VCG.AI



**Jon Goriup, CEO**  
Product development  
and business



**Mateja Dermastia, COO**  
Previously founder of a  
biotech scaleup with a  
+100 team.



**Dr. Dominik Patzelt,**  
**Director of Biz Dev**  
PhD in circular business  
transformation



**BIO-TECH ENGINEERS**  
**DATA SCIENTISTS**  
**CIRCULAR BUSINESS EXPERTS**

## ADVISORY BOARD



**Dr. Beat Wolf, CTO**  
15 years in AI & big  
data application  
development



**Dr. Andreas Fischer,**  
**Chief Scientist (AI)**  
PhD with over 100 AI &  
ML publications



**Fadli Fadli, Head of**  
**Projects** Led industrial  
scale circular projects  
in Europe & Asia

**Dr. C. Patermann**  
Former director of  
EU Commission  
for bioeconomy

**Ilaria Re, MSc**  
Coordinator of  
bioeconomy pilot  
Vanguard Initiative

**Dr. E. Reinmuth**  
Head of  
Bioeconomy at Uni.  
of Hohenheim

**Dr. Karen Zheng**  
Professor at MIT,  
AI in circular  
supply chains

**Dr. D. Hertweck**  
Digital business  
modelling of circular  
value chains



**vcg.ai**<sup>®</sup>

VALUE CHAIN GENERATOR

# LET'S REALISE CIRCULARITY TOGETHER!

SCHEDULE A DEMO CALL TO SEE VCG.AI IN ACTION

## CONTACT US

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[www.vcg.ai](http://www.vcg.ai)

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CEO VCG.AI  
[jon@vcg.ai](mailto:jon@vcg.ai)

# Yeast-2-value

Greenfield investment into upcycling of brewer's spent yeast into high-value ingredients for Belgium

**Prepared by**

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Business Development Associate

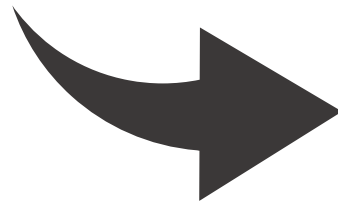
# BREWER'S SPENT YEAST

## UNDER-UTILISED, OFTEN WASTED



### Brewery spent yeast

Rich in nutrients, represents over 10% of by-products generated by breweries



Soil additive



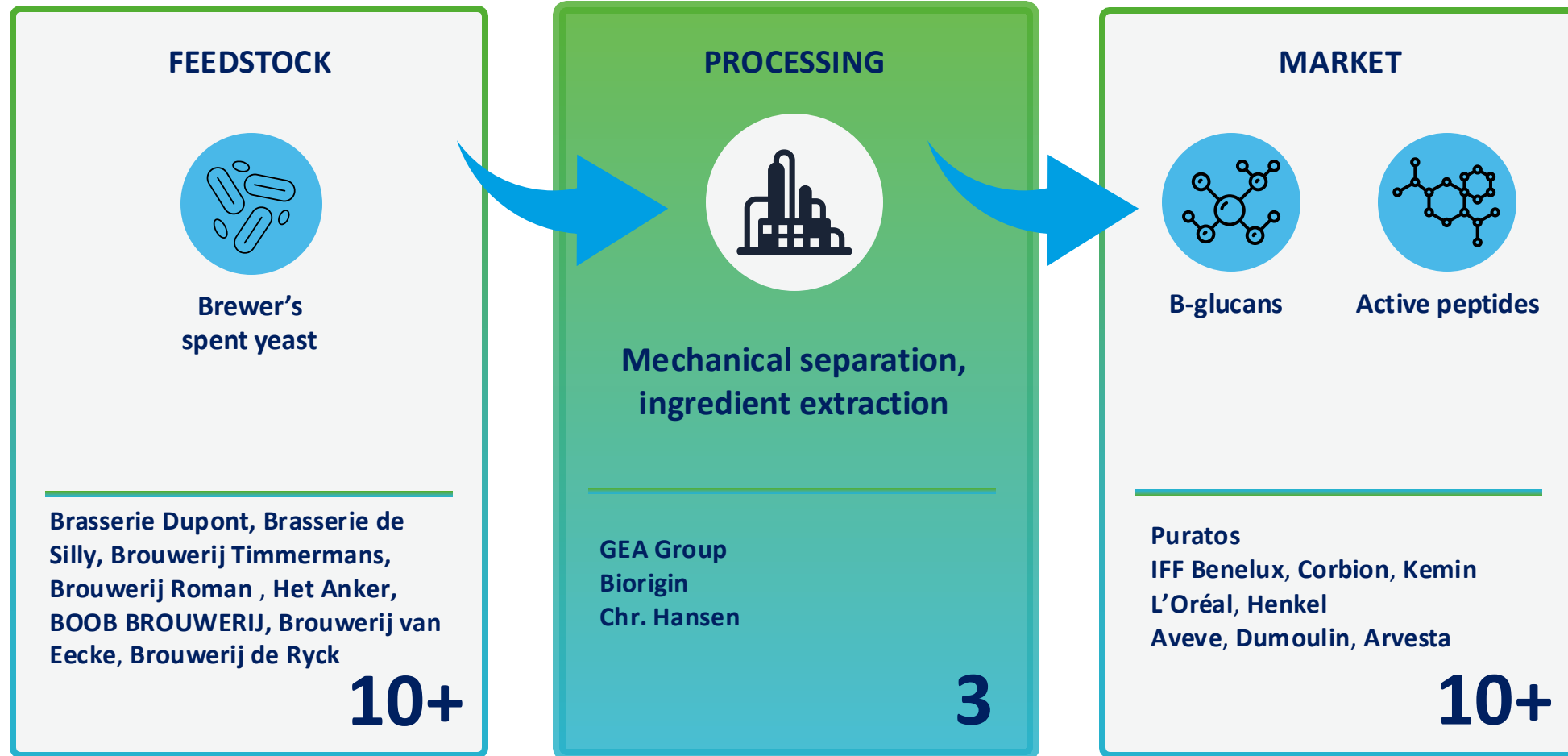
Sold as low value wet animal feed



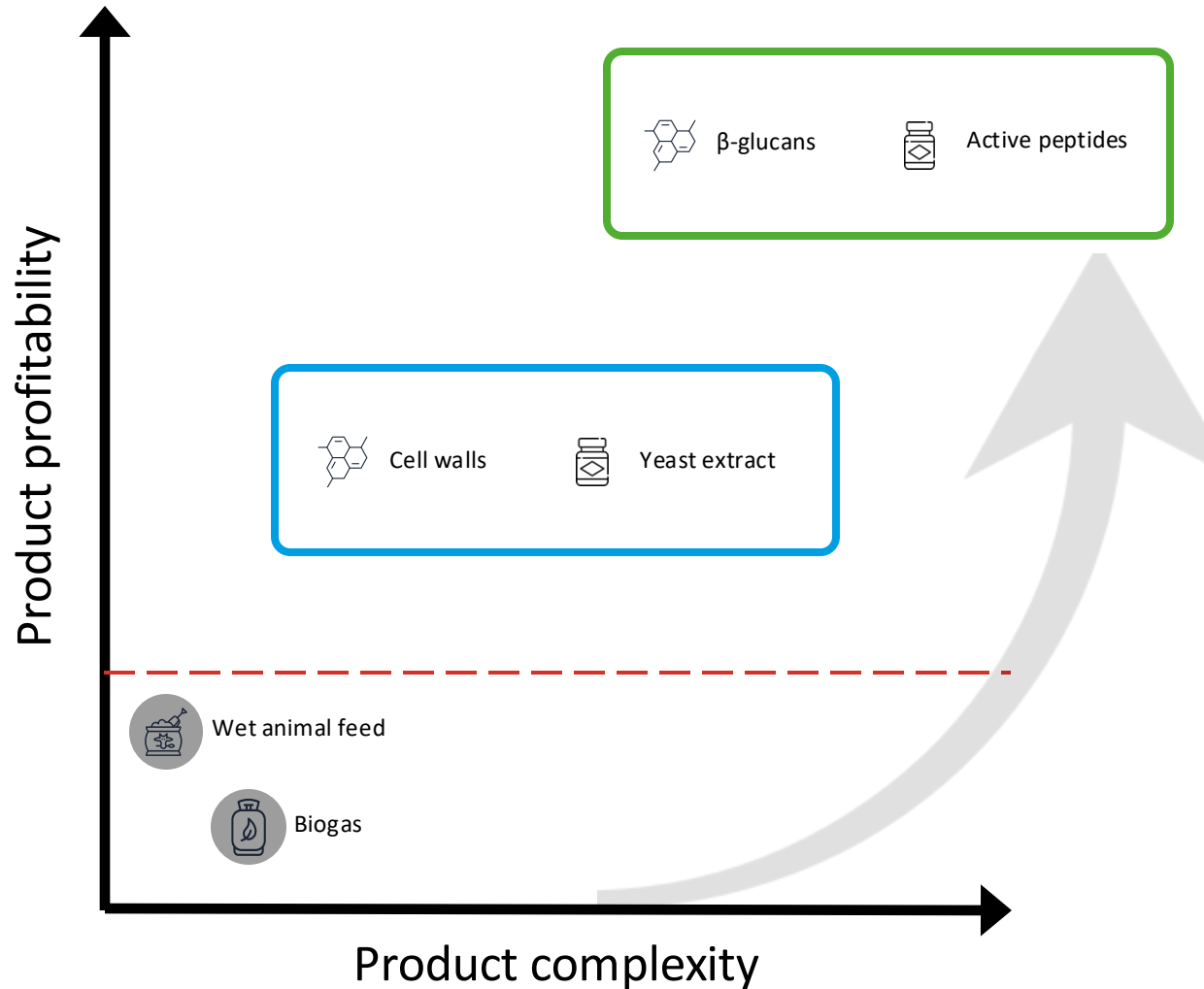
Used as feedstock for biogas production

# INNOVATIVE CIRCULAR SOLUTIONS

## BREWER SPENT YEAST INTO HIGHER VALUE PRODUCTS



# AIMING FOR HIGH VALUE-ADDED MARKETS



Current innovations allow for the extraction of  $\beta$ -glucans & active peptides as the highest value valorisation at industrial scale.

Extraction of Cell walls and yeast extract represents a step towards in unlocking part of the higher value possibilities of BSY with high production volume requirements.

BSY application in wet animal feed and biogas production is a lowest value-add treatment, still commonly applied across the industry.

# MARKETS AND INDUSTRY APPLICATIONS

## $\beta$ -glucans

**Market price: 7.500 - 10.000 €/MT**

**Market CAGR: 8% (2023-2030)**

**Market (global) size: 1.1 billion (by 2030)**

## Active peptides

**Market price: 12.500 - 15.000 €/MT**

**Market CAGR: 10,11% (2024-2030)**

**Market (global) size: 10 billion (by 2030)**



**Pet food & feed**



**Chemical**



**Pharmaceutical**


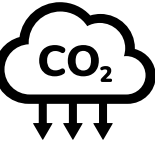


**F&B**



**Cosmetics**

# ENVIRONMENTAL SUSTAINABILITY PROTEIN COMPARISON TABLE

	Brewery's yeast	Pea protein	Beef protein
Water required	 30x more	30x more	250x more
GHG emitted	 10x more	10x more	80x more

# EXAMPLE FROM THE INDUSTRY

## LEIBER (DE) - GROWTH & EXPANSION

Revenue in 2019  
**116mio €**

Workforce in 2019  
**+250**



Opens Polish  
subsidiary

Opens Russian  
subsidiary

Expands existing  
capacity

Enters Spain by  
taking over ABN

Plans to expand  
in the US

2003

2009

2017

2024

..



# Whey-2-value

Greenfield investment into upcycling of the dairy industry's by-products into high-value ingredients for Belgium

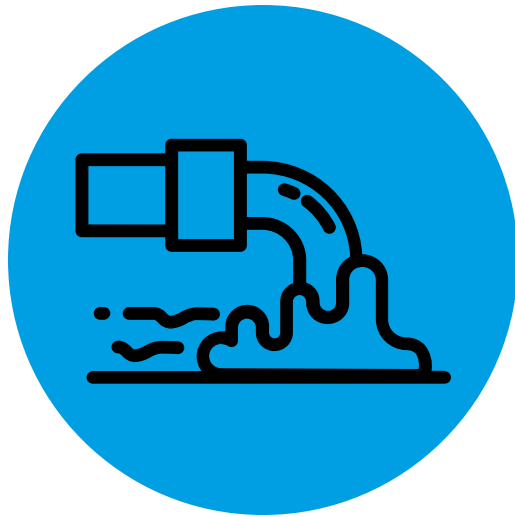
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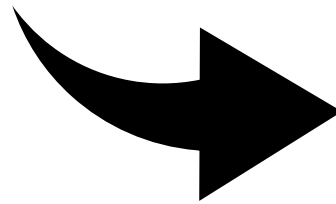
# WHEY & DAIRY PERMEATES

## UNDER-UTILISED, OFTEN WASTED



### Sweet whey & permeates

Major by-products of dairy processing, generated during cheese and yogurt production.



Lower value products



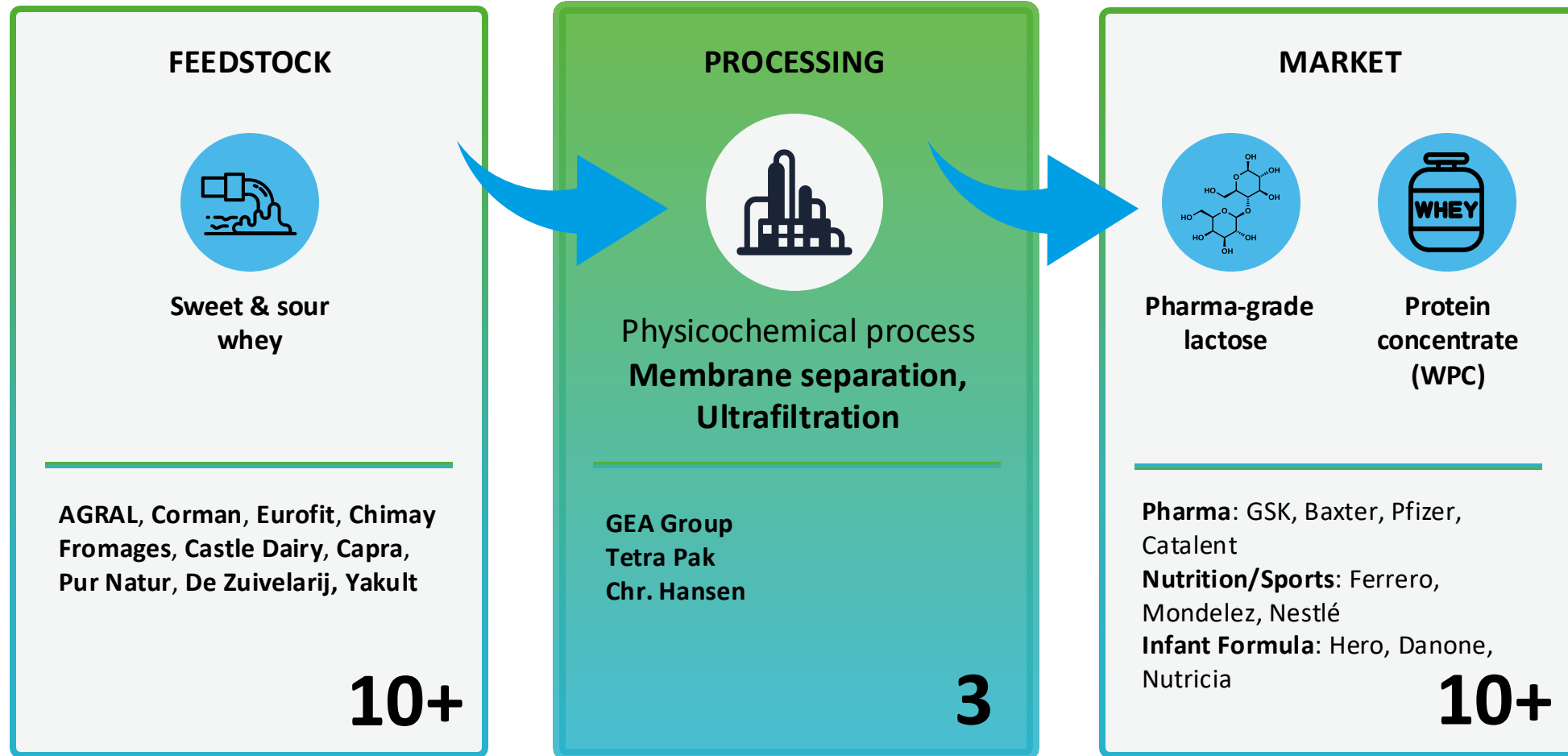
Released in the environment



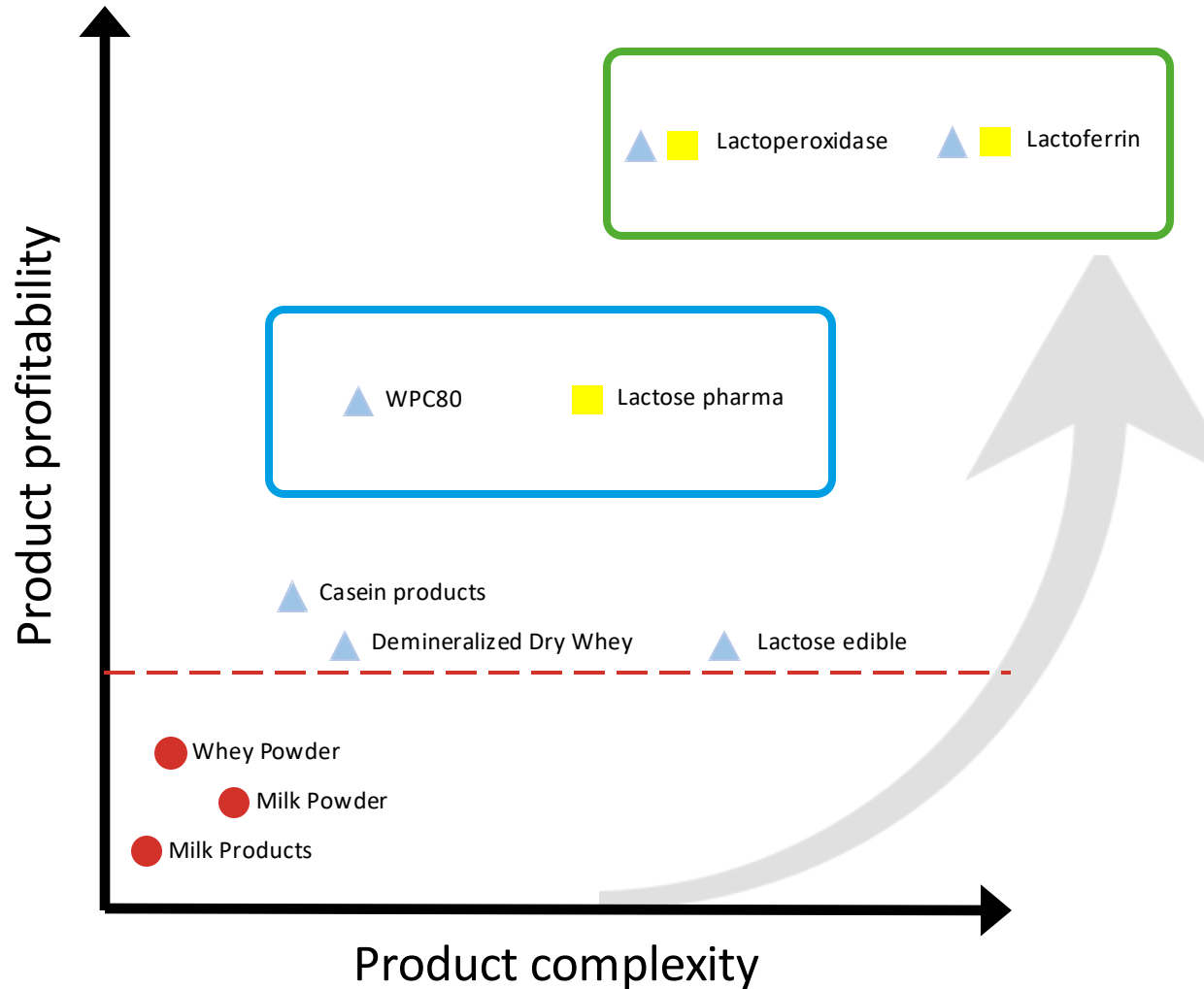
Used as feedstock for biogas production

# INNOVATIVE CIRCULAR SOLUTIONS

## DAIRY BY-PRODUCTS INTO HIGHER VALUE PRODUCTS



# AIMING FOR HIGH VALUE-ADDED MARKETS



The process allows for technological upgrades and adaptation to produce highest value products.

Extraction of WPC80 and pharmaceutical grade lactose is a proven process, that allows a profitable valorisation of dairy industry by-products at industrial scale.

- ▲ Products for the food industry
- Products for the pharmaceutical industry
- Traditional dairy products

# MARKETS AND INDUSTRY APPLICATIONS

## WPC80

**Market price: 11.000 - 14.000 €/MT**

**Market CAGR: 10,5% (2022-2030)**

**Global market size (WPC): 14.3 billion  
(by 2031)**

## “Pharma-grade” lactose

**Market price: 2.000 - 2.500 €/MT**

**Market CAGR: 5,2% (2024-2032)**

**Global market size: 3.2 billion (by 2027)**



**Confectionary**



**Nutrition**



**Pharmaceutical**



**F&B**



**Cosmetics**

# EXAMPLE FROM THE INDUSTRY

## SERUM ITALIA - PRODUCTION OF PROTEINS (NO LACTOSE)

### Year 2021

Revenues	<b>52,5 mio. €</b>
Net Income	<b>6,2 mio. €</b>

**EBITDA % = 15.1%**

**ROA\* = 24.2%**



# ENVIRONMENTAL SUSTAINABILITY

## IMPACT ON MULTIPLE LAYERS



### Reduced costs, logistics and CO2 emissions

Local processing instead of transport abroad, 9,000+ tonnes less CO2 emissions/year



### Sustainable source of protein and lactose

40 times less CO2 emissions/kg protein compared to beef



### Development and long-term competitiveness

Higher added value for by-products of the dairy industry in Belgium



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**Let's accelerate the development  
of the circular economy together!**

## **Contact Us**

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