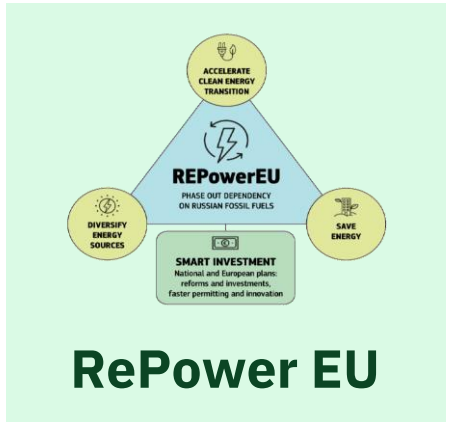
Trading update

1. June 2022

Strong market drivers for our products

Industry push for decarbonising

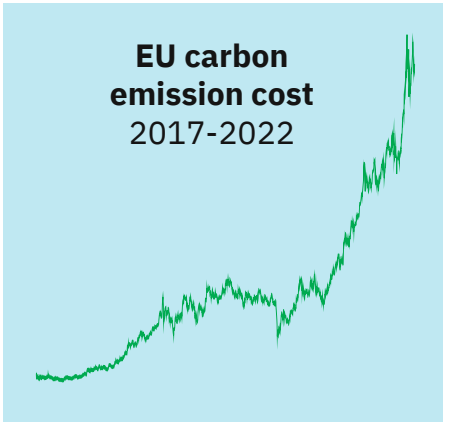
Economic realities



RePower EU

Circular economy

Policies and regulation



EU accelerating decarbonisation

VOW green metals

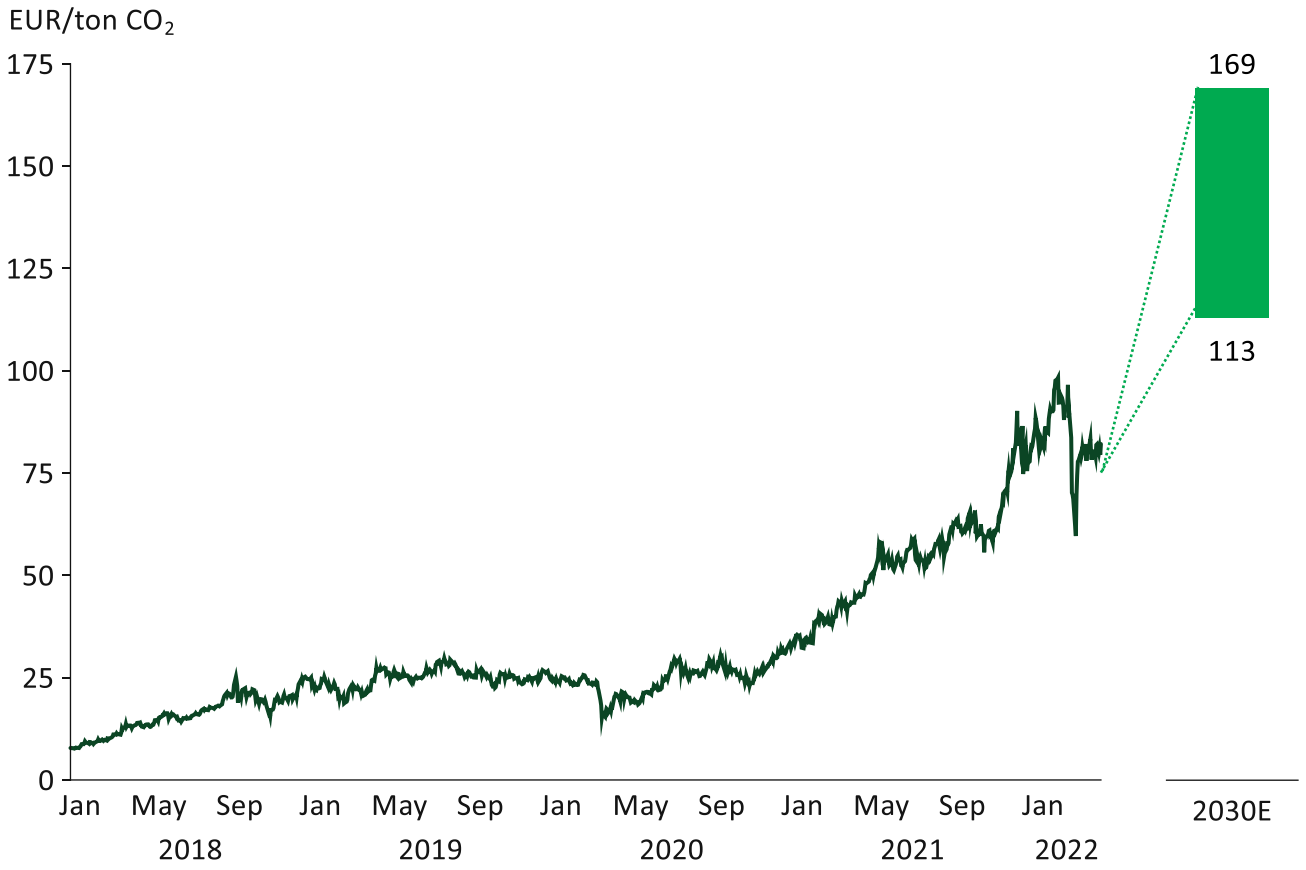
REPowerEU
Europe’s accelerated renewable energy transition

The REPowerEU plan

- Building on the Fit for 55 package, the REPowerEU plan will accelerate Europe’s clean energy transition even further
- Proposing to increase renewable energy generation targets to >1,200 GW by 2030
- Boosting sustainable biomethane production to 35 bn m^3 (~350 TWh p.a.) by 2030 with estimated 37 bn EUR investment
- In total, the REPowerEU plan will entail a 210 bn EUR investment on top of what is needed to reach the Fit for 55 objectives

Cost of CO_2 emissions has increased significantly

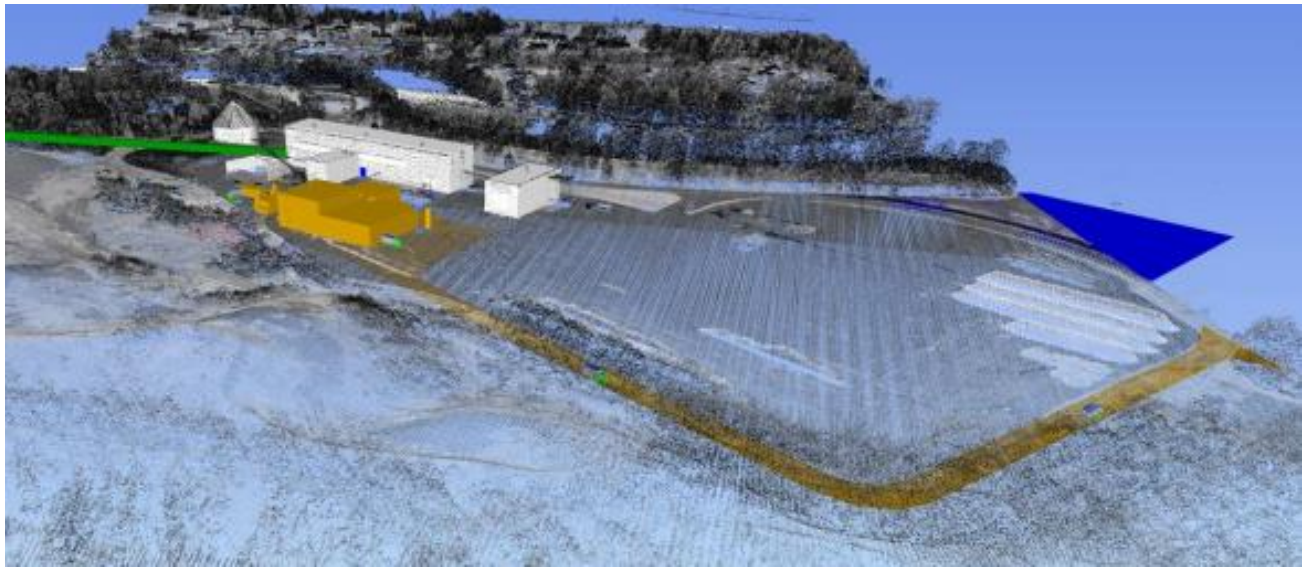
CO_2 emission cost (EUA) expected to increase even further



Note: EUA prices and estimates for 2030 from Vertis Environmental Finance (Jan 2022)

Follum update

New location for the plant at Follum



Industrial BioCarbon production underway at Follum

- Building a commercial plant capable of producing 10,000 ton BioCarbon annually
- Process equipment ordered October 2021
- New location at Follum: The woodyard
- Study for necessary adjustments to new location ongoing

Strategic partners already in place for BioCarbon and CO2-neutral gas

- Vow ASA provide technology and project execution capabilities
- Have secured wood waste from feedstock partner Lindum
- Signed LOI with Elkem and Vardar for supply of BioCarbon and CO_2-neutral gas

Business outlook

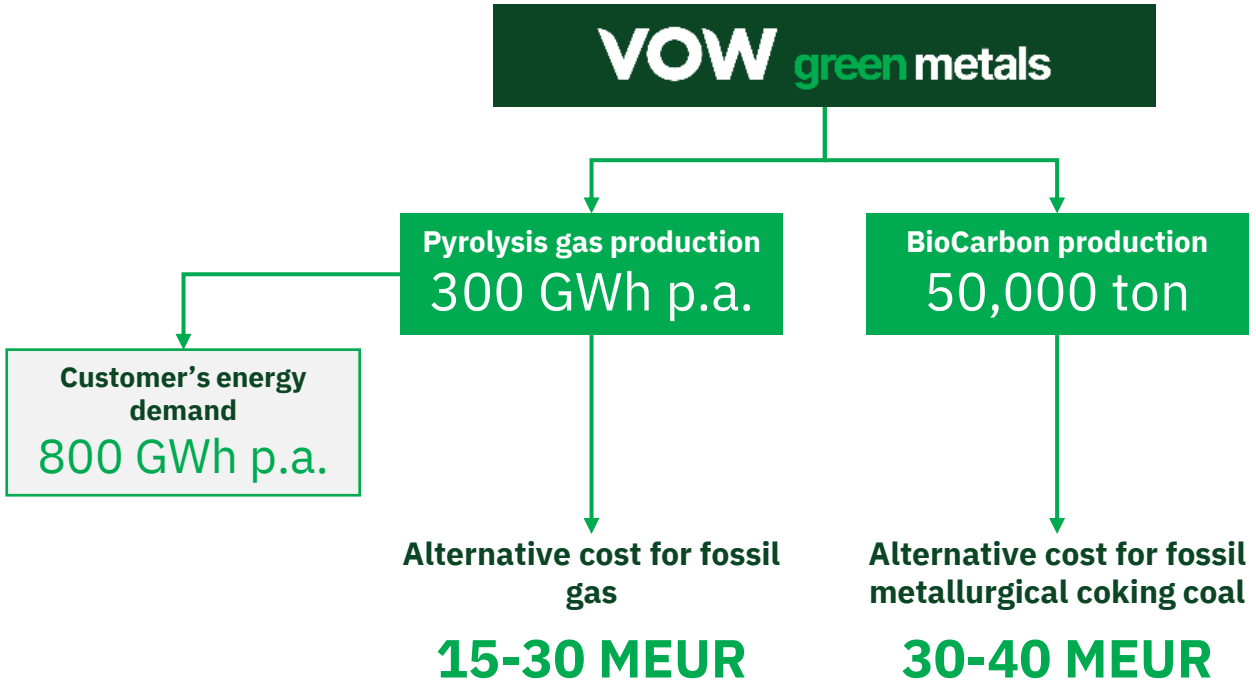
Working with potential partners to find new sites

Screening for new potential sites

- Screening of new potential sites in Europe ongoing
- Potential partners are interested in a collaboration to replace fossil energy sources
- Currently in dialogue with several companies
- Have signed LOI with potential for 50,000 ton biocarbon production

Example of a 50,000 ton concept

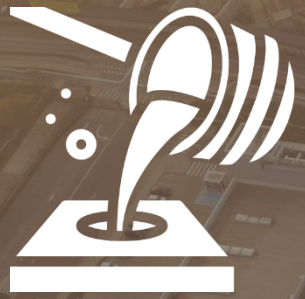
Energy intensive industries are large potential pyrogas customers



Note: 1) S&P Global Platts 2022, >3 ton CO_2 is emitted from 1 ton carbon; 2) Eurostat, 200 g CO_2/kWh natural gas for energy (>400 g CO_2/kWh for electricity production)


VOW green metals
Building a Biocarbon and Bioenergy industry

Current challenges



Metal production

Fossil coal is used as a reducing agent in a chemical process to make metals

Natural gas consumption

EU industry must find green alternatives to its 1,000 TWh natural gas consumption

Recycling and circular economy

EU countries see increased recycling requirements by 2025 and 2030

Source: Eurostat and European Environmental Bureau

Our solution

We **recycle** biomass waste streams into

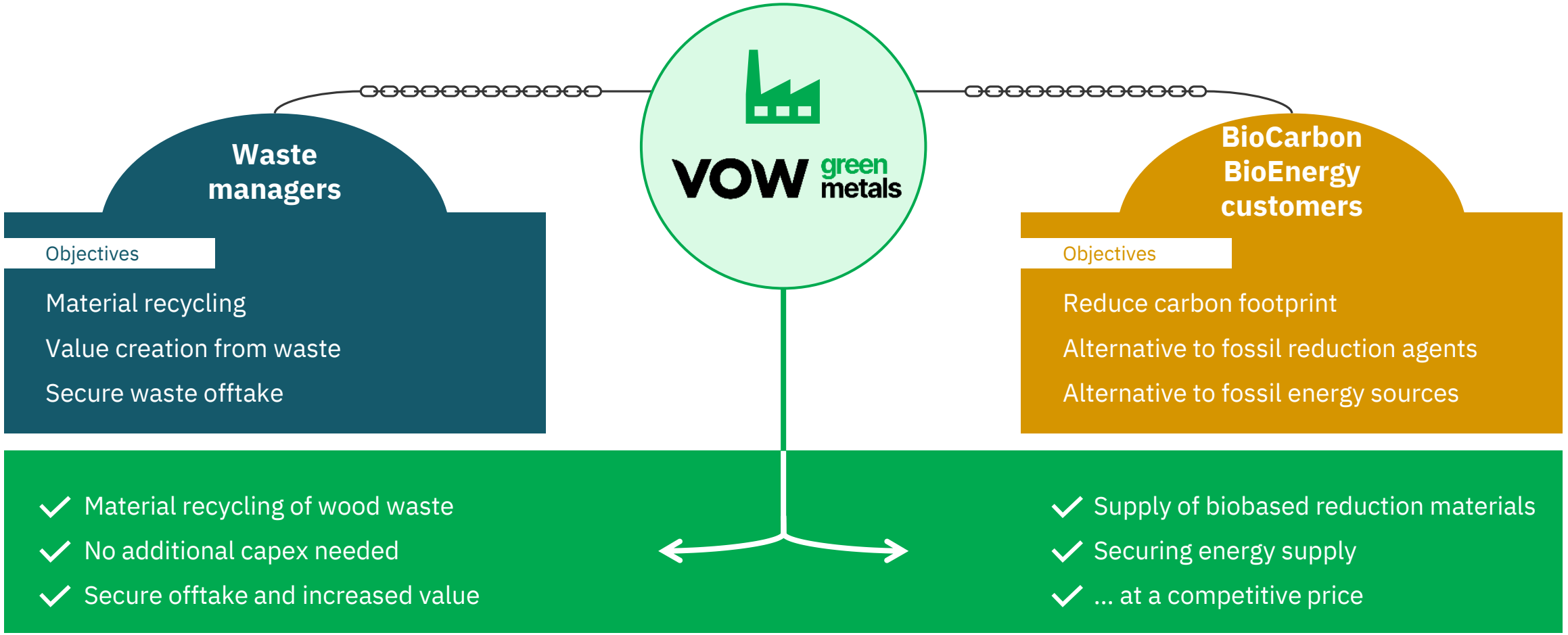
Biocarbon as a reduction agent for the metallurgical industry

Climate-neutral gas to replace fossil energy sources

VOW green metals

Vow Green Metals is the missing link between waste managers and the industrial customers

Enabling partners to take part in the circular economy



Vow Green Metals was a demerger from the technology provider Vow

1993
Scanship founded

2015
Scanship reached 200 MNOK in revenue

2019
Acquiring Etia, a French company founded in 1989 with substantial pyrolysis experience and knowledge

2020
Scanship changed name to Vow ASA

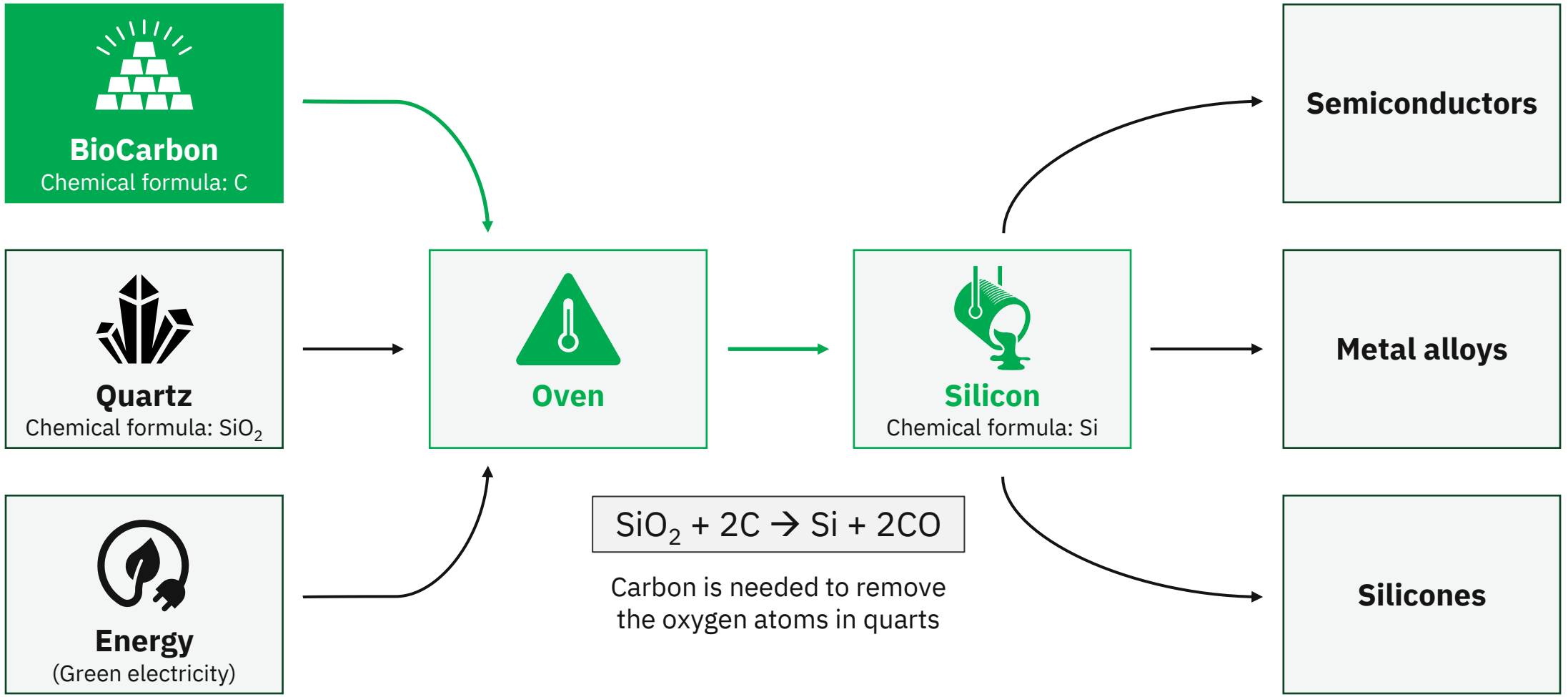
2021
Demerger and listing of a new industrial company, Vow Green Metals

2022
Vow ASA acquire C.H. Evensen founded 1937, a technology provider with >4000 high-temperature ovens installed. >220 employees.

2023
Our first plant will be operational, producing 10,000 ton biocarbon annually. LOIs already signed with all partners.

VOW green metals

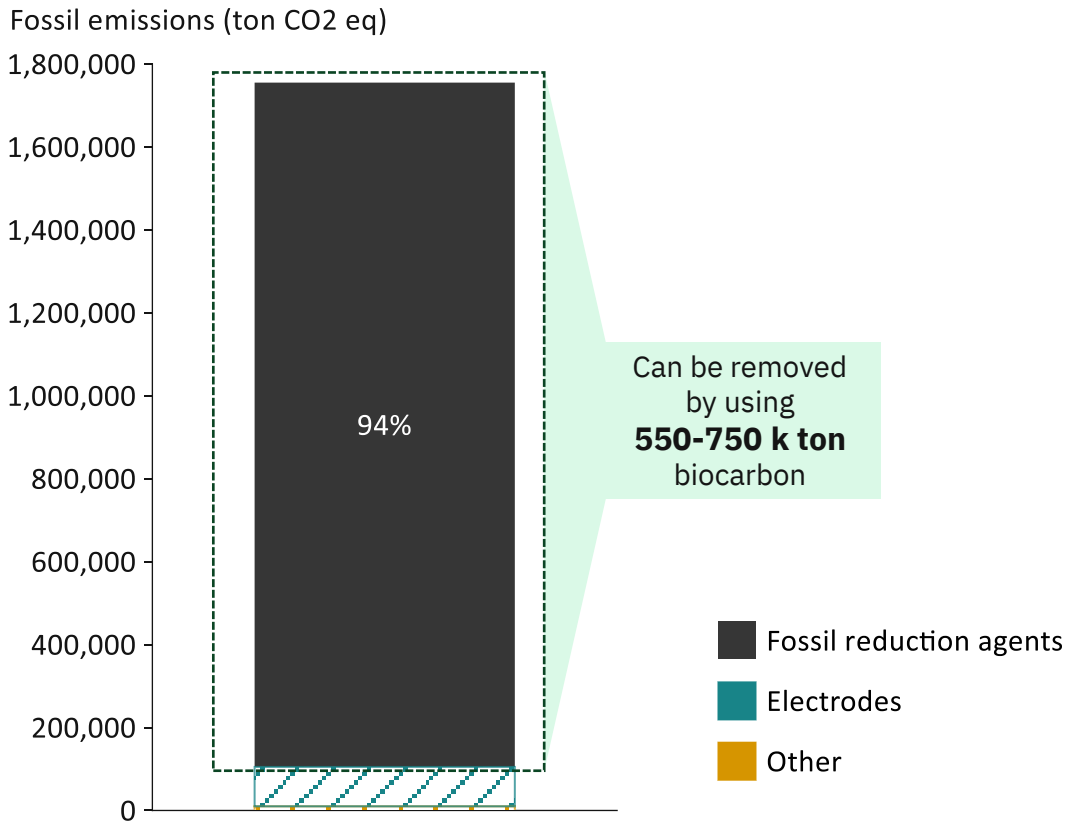
Carbon is needed as a reduction material to produce several metals, including Silicon



VOW green metals

Reduction agents currently account for more than 5% of the CO_2 emissions in Norway

Si and FeSi emissions, Norway



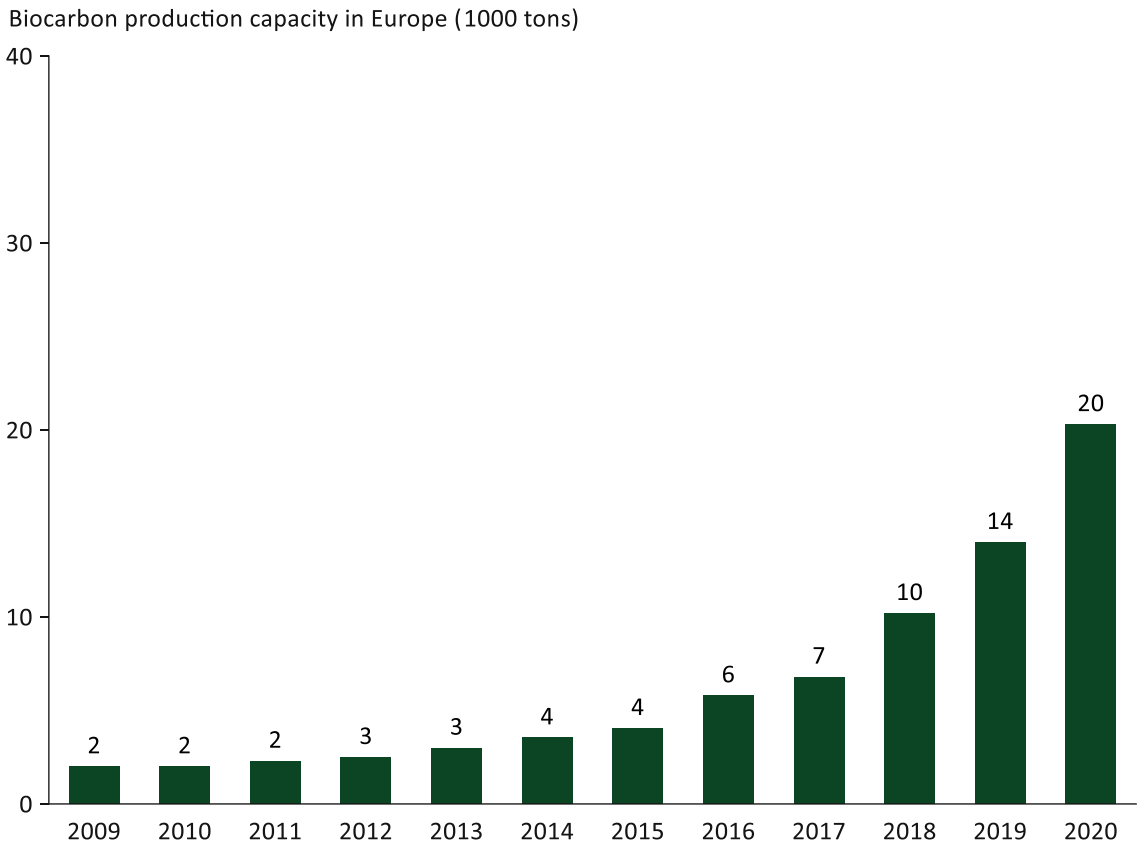
Comments

- Currently, the metallurgical industry is mainly based on fossil reduction materials
- Biocarbon can directly substitute fossil-based reduction agents
  - Metal producers can use existing infrastructure
- Close to 1 million ton fossil coal and coke used by metal producers in Norway annually
  - Corresponding to 3 million ton CO_2 emissions per year

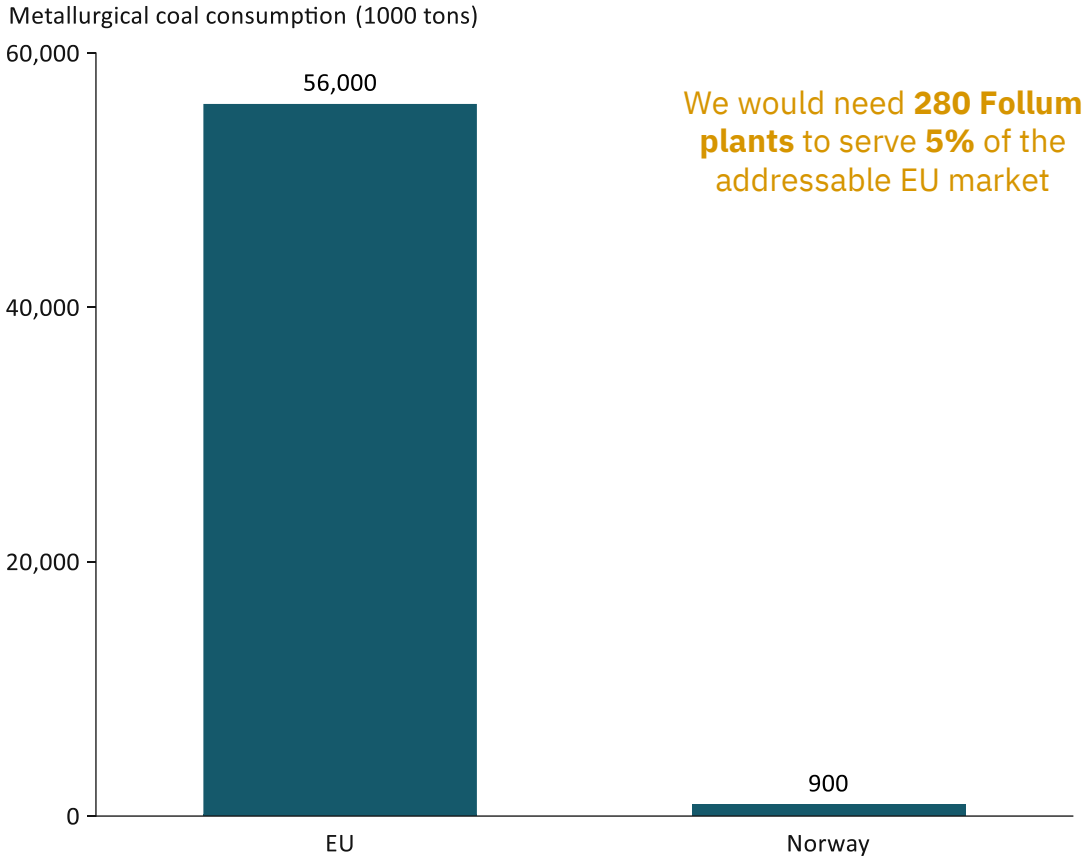
Source: SpareBank 1 Markets, Miljødirektoratet, SINTEF

Limited production of biocarbon is the major bottleneck

Biocarbon production in Europe



Not even close to cover demand



We would need **280 Follum plants** to serve **5%** of the addressable EU market

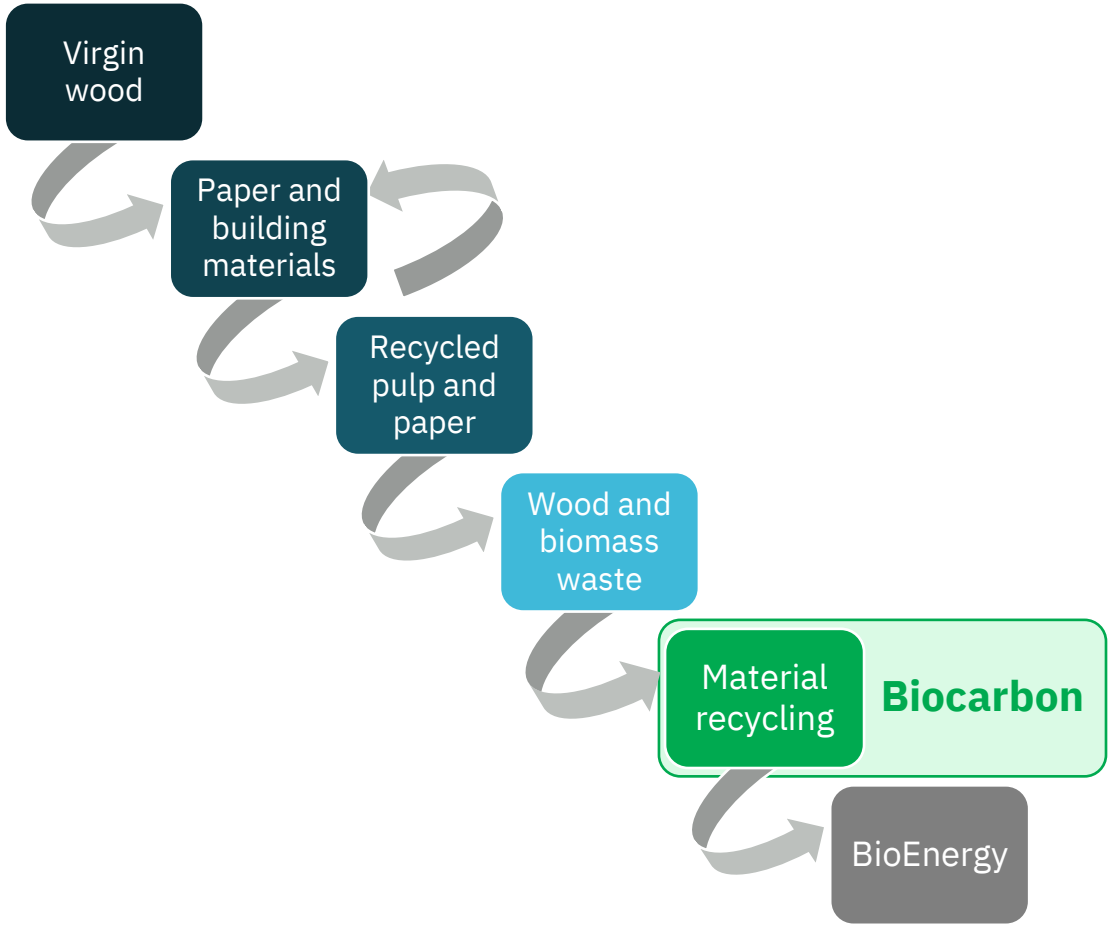
 Source: IEA, SpareBank1 Markets

VOW green metals

In the circular economy, creating new materials is preferred over energy recovery

Cascading for valorization of waste in the circular economy

- We promote a circular approach based on the cascading process principal
  - In a cascade process, materials are ranked higher than energy
- We intend to use waste materials to produce biocarbon
  - Instead of using virgin wood, we strive to use waste as feedstock
  - We increase circularity as it is few other processes that can make a material from a large share of wood and biomass waste
- Our approach will increase the value in the circular economy compared to using waste to produce energy



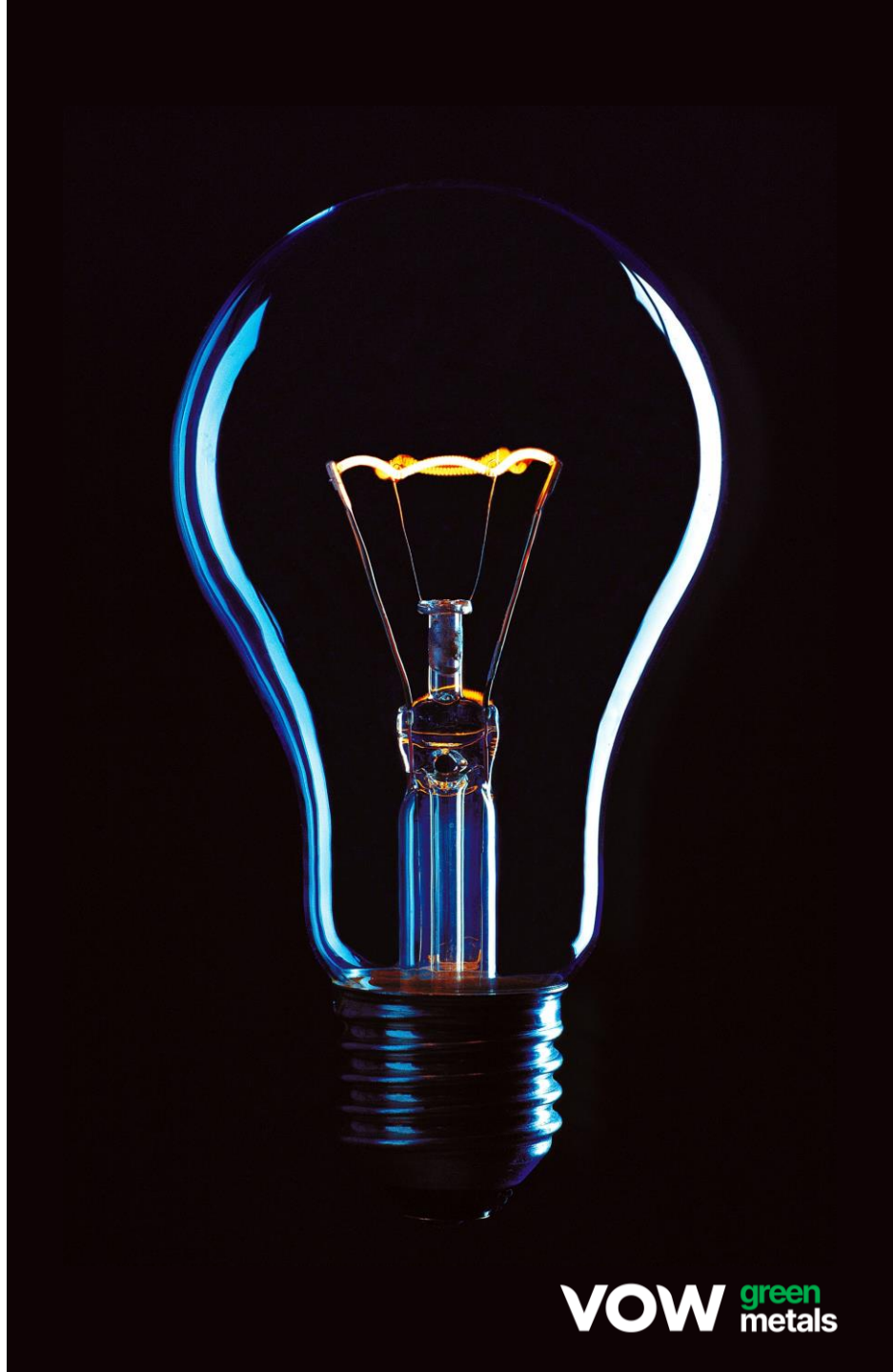
Our year-around operation ensure a secure and stable energy supply

We can supply stable energy all year round
- Reducing risk of energy shortage

One plant can produce 300 GWh CO_2-neutral gas per year
- With only one plant, a large share of energy consumption can be secured

Low risk and investment cost for transition to green energy source
- Already entered LOIs for customers in need of biocarbon

Partners can continue focusing on core business
- Vow Green Metals' business model is to build, own and operate these plants
- Cooperation model evaluated case by case



We have an international expansion plan

Phase 1

Follum stage 1

Capacity of more than 10,000 tonnes biocarbon with 60 GWh of pyrolysis gas

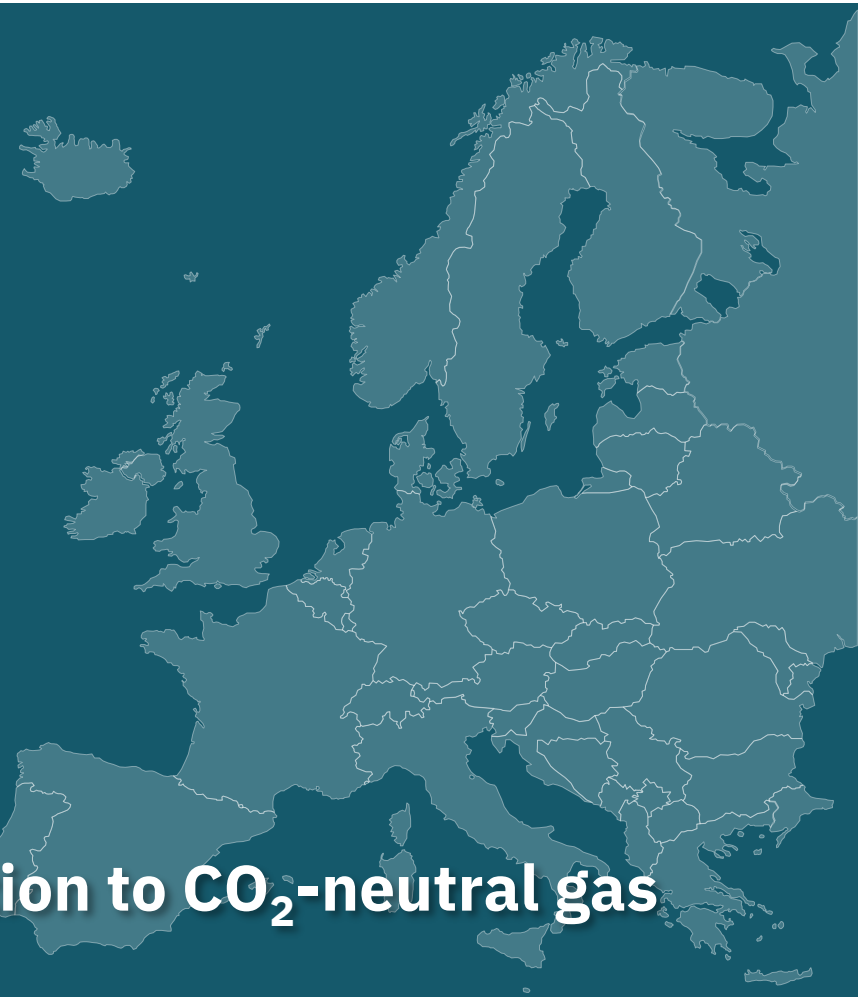
Phase 2

Expansion into Europe

Identified several locations for potential expansion in Norway and Europe

Expansion of biocarbon production volume; LOI for production of 50,000 tons p.a.

Replacing natural gas with CO_2-neutral gas, decarbonizing energy intensive industries



Building a business relevant for the energy transition to CO_2-neutral gas

VOW green metals

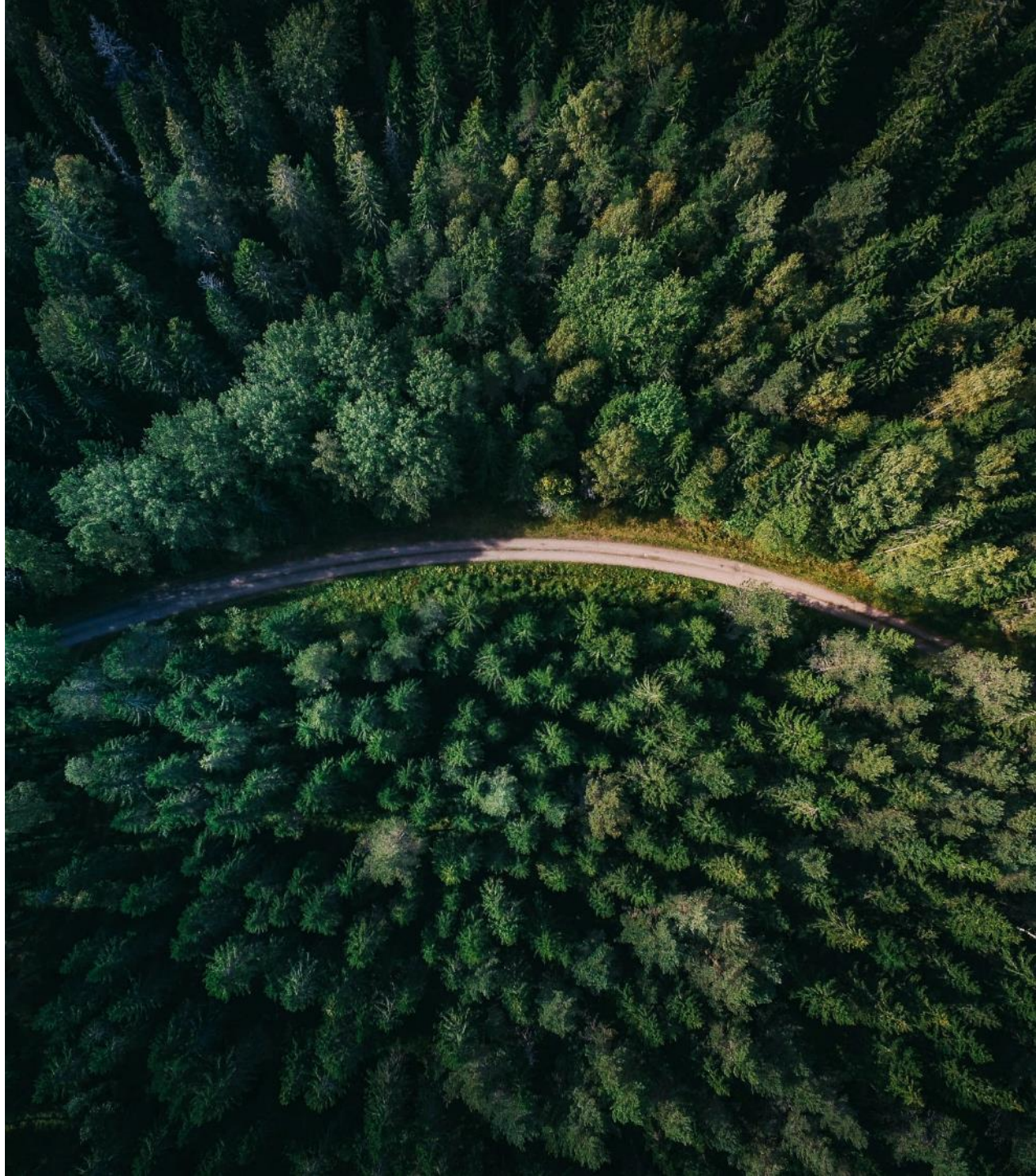
Accelerating growth

- EU metallurgical coal and coke consumption is 56 million tons
- Biocarbon is the only renewable alternative to fossil reduction agents in several industries
- Demand for CO2-neutral gas is rising due to increased regulatory pressure and cost for fossil alternatives
- We see significant interest from large industrial players wanting take part in this new industry

Vow Green Metals

Market Leader Ambition

Acting Now



Vow Green Metals AS
Lysaker Torg 12 | 1366 Lysaker | Norway | www.vowgreenmetals.com

VOW green metals

Elkem

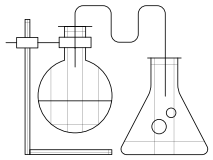
Reducing CO_2 emissions by replacing fossil sources with biocarbon in our production

Biocarbon & Bioenergy Day, Oslo – 01.06.2022

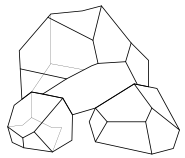
Jon Rune Vetleseter

We are Elkem

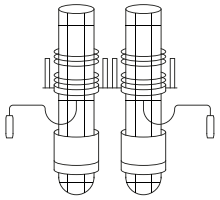
Advanced material solutions shaping a better and more sustainable future



Silicones



Silicon Products



Carbon Solutions

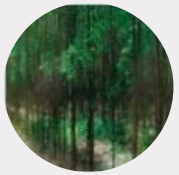
Elkem

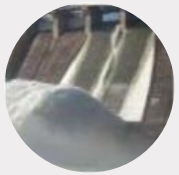
Sustainability is an integrated part of our value chain: From raw materials through the production to end products

Low cost sustainable input factors


Quartz


Coal


Biocarbon


Power

High temperature/chemical production processes


Silicones


Silicon, ferrosilicon, foundry products and microsilica


Carbon solutions

Examples of high value applications and markets

Silicon is included in the EU's list of critical raw materials and is considered a critical "transition element" during the EU's energy transformation under Green Deal / Fit for 55

Our climate ambitions

Elkem is committed to reduce emissions and contribute in line with Paris agreement aim of well below 2°C warming

We aim to contribute to a better climate through three key levers:

1

Reducing our emissions

Achieving fully climate neutral production throughout our value chain

- **By 2031:** Reducing absolute emissions* by **28%** from 2020-2031 – delivering **39%** improvement in product footprint**
- **By 2050:** Achieving fully carbon neutral production (zero fossil emissions) globally

2

Supplying to the transition

Providing the advanced material solutions required to enable the green transition

- **Grow supplies of advanced materials to green markets**
- **Build new business in green markets**

3

Enabling circular economies

Enabling more circular activities in our operations, products and markets

- **Increase recycling – own and customers'**
- **Develop the eco-design of innovative products**

Elkem

* Total global fossil CO_2 emissions, scope 1 and 2
** Main products average fossil CO_2 emissions, scope 1-3

Elkem’s climate actions: Reducing our emissions

By 2031:

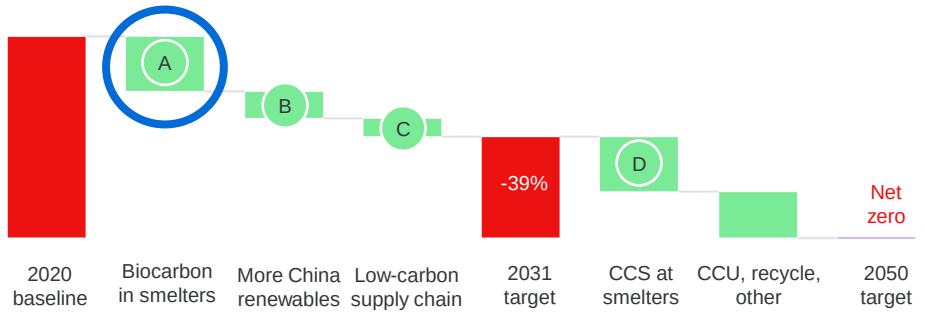
- Reducing absolute emissions* by **28%** from 2020-2031
- Increasing biobased CO_2 from >20% in 2021 to 50% in 2031

By 2050:

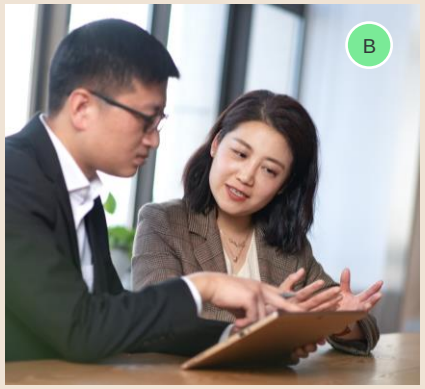
- Achieving fully carbon neutral production (zero fossil emissions) globally

Our roadmap to climate neutral products

(Illustrative)

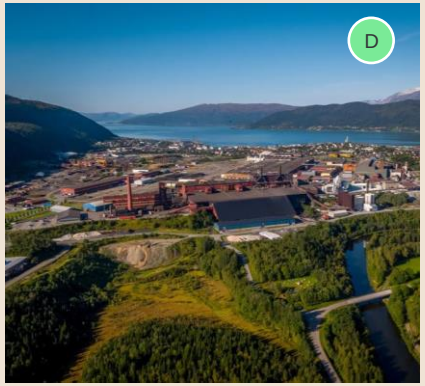


Changing to biocarbon as reduction material



Shifting to renewable power also in China

Low-carbon supply chain



Exploring potential of more CCS at smelters

Elkem

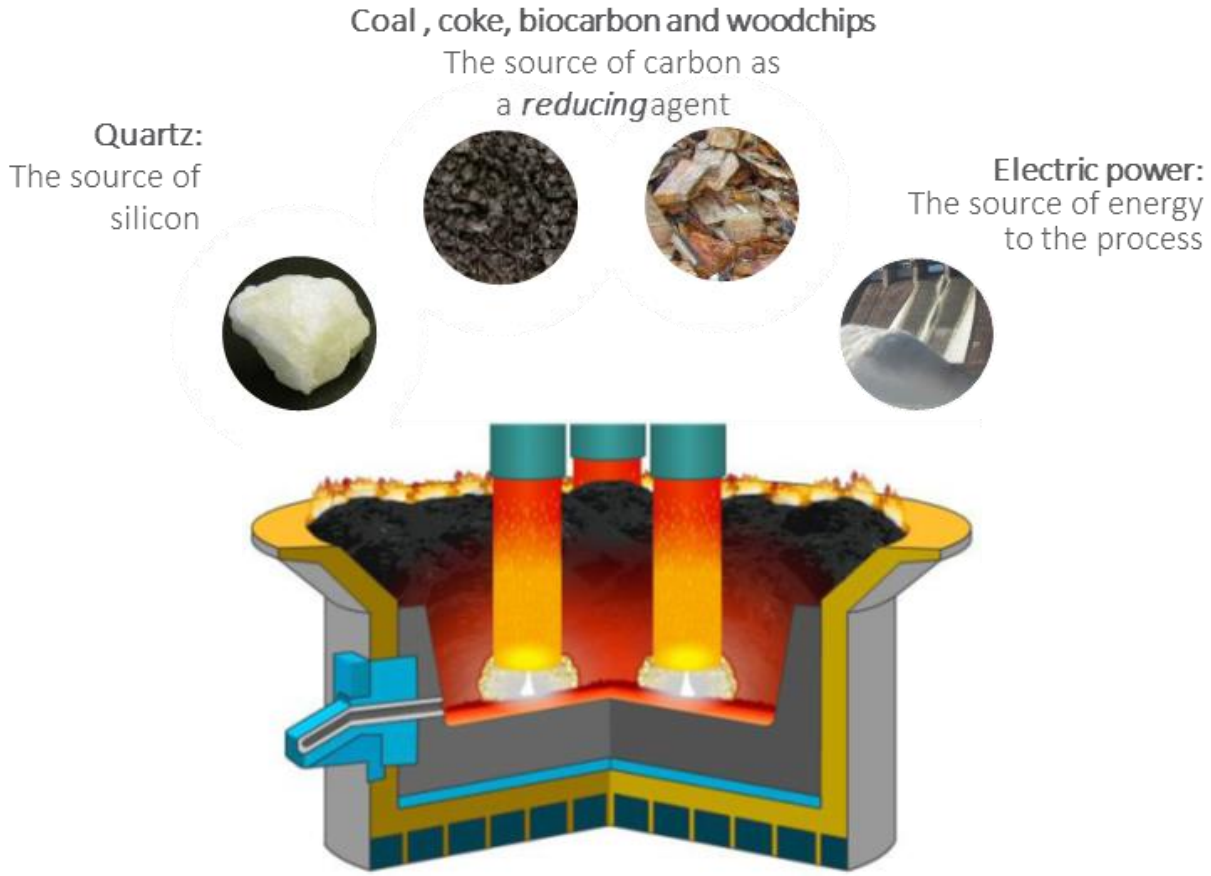
* Total global fossil CO2 emissions, scope 1 and 2

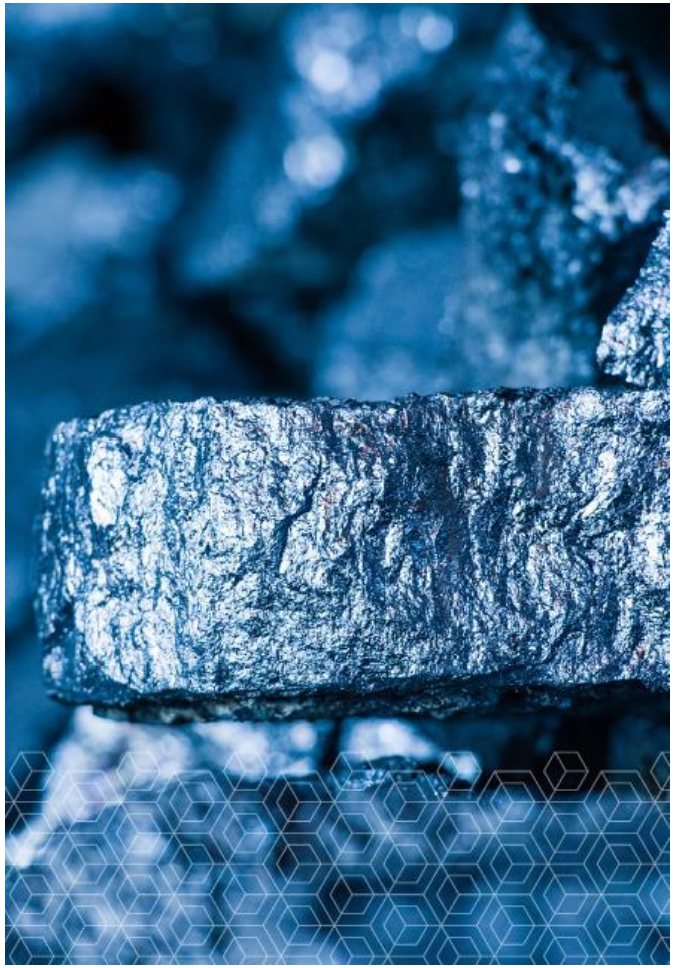
Why does Elkem need biocarbon?

- The process industry emits CO_2 through production
- Elkem and other industry companies
  - committed to reducing the carbon footprint of our production and to;
  - contribute to meeting the ambitions of the Paris agreement.
- Raw material based on biological sources is today the only known replacement for fossil sources in the metallurgical processes
- The nature of biocarbon makes the emissions carbon neutral
- Using biobased sources in the hard-to-abate processes will give large CO_2 reduction effect

Elkem

Carbon for Si-production is necessary part of the chemical reaction





The main process: $SiO_2 + 2C = Si + 2CO$

Elkem

High future demand requires multiple biocarbon projects

To reach the ambitions climate targets, Elkem will need additional 200-250 000 MT of biocarbon within 2031

- No biocarbon ready for permanent industrial scale use today
  – development of technology for new product and process

- Raw material access and logistics limit size of projects
  – multiple projects and factories necessary to meet demand

Elkem

Developing partners is important for Elkem

Elkem cooperating with projects internationally at different stages

- Elkem own technology development constructing pilot industrial scale in Canada by end 2022
- Continuous evaluation of projects world-wide
- Actively supporting value creation for local forestry
- Elkem cooperation with Vow Green Metals to establish biocarbon production at Follum

Focus on changes to increased biocarbon to Si production

Important enablers to speed up reduction in fossil CO_2

- **Predictable framework conditions for transition from fossil to biobased raw materials**

- **Accelerate access to competitively priced resources**
  - Support schemes related to extraction and handling of biobased side- and waste streams from forestry, sawmills, recycling and other

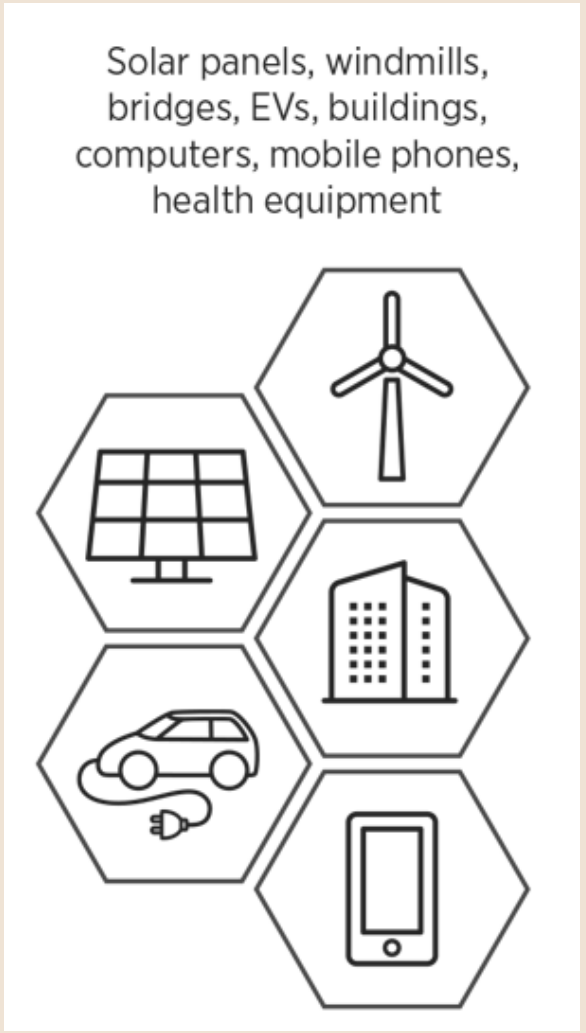
- **Strengthen support of biocarbon investments from R&D to production and use**
  - Need for comprehensive schemes for biocarbon implementation
    - from the development of new technology to the implementation of new production facilities
    - for necessary constructions and changes in existing plants and smelters the increased use of biocarbon

Elkem

Biocarbon for Si is optimal use of biobased materials - implementation require right conditions

Biocarbon for Si favorable in most areas:

Key considerations:	Value creation	GHG reduction	Energy efficiency	CCU/CCS opportunity	End use
Biocarbon for Si	High	Direct	Surplus	Yes	Energy efficiency products required for Green Shift



Pre-requisites for transition to biocarbon

- **Favourable conditions for industry** that reduce emissions today
- **Development of technology and factories**
- **Long-term access to biocarbon**
  - High-quality, renewable and sustainable
- **Biocarbon must be competitive**

Elkem

Elkem

Thank you for your attention!

BILLERUDKORSNÄS

How does BillerudKorsnäs work with development of sustainable packaging products?

Biocarbon & bioenergy day

2022-06-01 Louise Wohrne, Director Sustainability & Public Affairs

BILLERUDKORSNÄS

We challenge conventional packaging for a sustainable future

We drive change by targeting major global challenges together with our customers & partners

CLIMATE CHANGE

CIRCULAR ECONOMY

We work to make future packaging:

100% recyclable

100% renewable

100% fossil free

100%

virgin fibre paper and pac

Paper and Packaging materials

Packaging solutions

5 800
employees

>13
Sales offices

10
Production units

Combined Net Sales approx. (2021)

37,2*
Billion SEK

Member of
Dow Jones Sustainability Indices
Powered by the S&P Global CSA

* *Reported net sales for 2021. Calculation based on USD/SEK exchange rate 8.60 (average during 2021).*

BILLERUDKORSNÄS

Two global challenges to solve

BILLERUDKORSNÄS

We challenge conventional packaging for a sustainable future

We work for a sustainable and circular society with packaging solutions that are renewable, recyclable and climate efficient

Safety first

Climate impact

Materials for the future

Sustainability foundation

Sustainable wood supply | Responsible supply chain | Engaging workplaces
Resource-efficient production | Community engagement | Responsible business

BILLERUDKORSNÄS

Climate targets aligned with science

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

CO_2-targets approved to be in line with the **Paris Agreement** 1.5 degree pathway

Scope 1 & 2*: **-59%** by 2030

Scope 3*: **-30%** by 2030

Some of our results in 2021*

-13%
CO_2 reduction from production
97.3% fossil free
(Scope 1 & 2)

-7%
CO_2 decrease for upstream transports
(Scope 3)

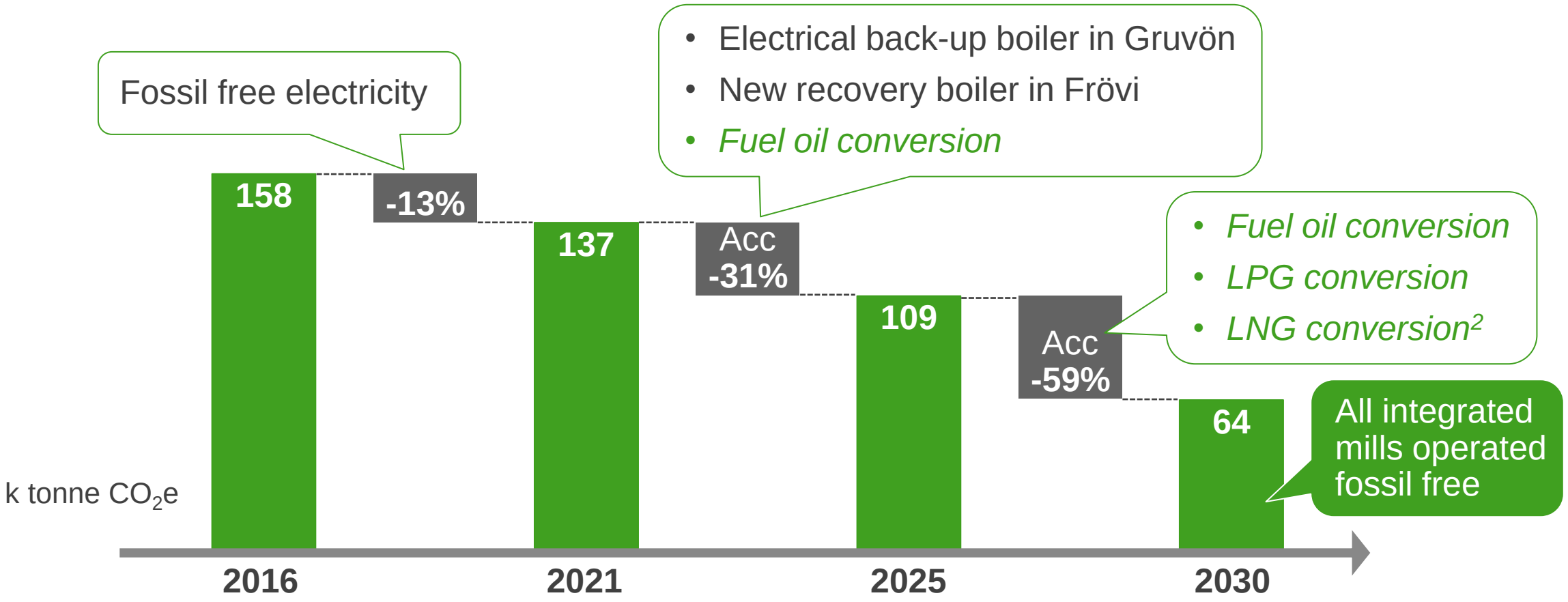
-19%
CO_2 reduction on purchased chemicals
(Scope 3)

-14%
CO_2 reduction on downstream transports
(Scope 3)

**Base year 2016*

BILLERUDKORSNÄS

Our roadmap to reach our Science Based Targets 2030[1]



1) Scope 1-2: Direct emissions from own operations and indirect emissions from purchased energy.
2) Applies only to Beetham.

We bring housewarming

Through local district heating

976 GWh = 49 000 houses

BILLERUDKORSNÄS

Ambition to build a state-of-the-art BCTMP and bio-gas plant

- Viken Skog and BillerudKorsnäs has formed a JV company to develop a competitive BCTMP operation in Hønefoss, Norway
  - A fibre and operation giving the best possibility to further development of **climate friendly packaging** based on wood raw material
  - A benchmark on **energy efficiency**
  - **A "future concept"** when it comes to way of working and solutions
  - Efficient use of existing infrastructure
- The ambition is to be ready for an investment decision in H1 2023

BILLERUDKORSNÄS

Technology development enables positive impact throughout the value chain

Advances in fibre technology and low specific electricity consumption per tonne pulp

Reduced pulp consumption per m^2 cartonboard with sustained product properties

Reduced energy consumption

Bio-gas production,
with possible upgrade to fuel quality

Industrial symbiosis:
District heating, bio-gas
& biocarbon production

Possibility of future BECCS

BILLERUDKORSNÄS

Products from Follum will contribute to a low-carbon and circular economy

- Energy efficient, fossil-free production will result in a pulp with very low carbon footprint
  - Low direct emissions from the mill
- Resource efficency: pulp with high bulk will enable lightweighted board, and a lighter final packaging
  - Will reduce customers’ scope 3 emissions

BILLERUDKORSNÄS

Thank you!

Member of

Dow Jones Sustainability Indices

Powered by the S&P Global CSA

Sahara Forest Project – climate smart agriculture in desert areas

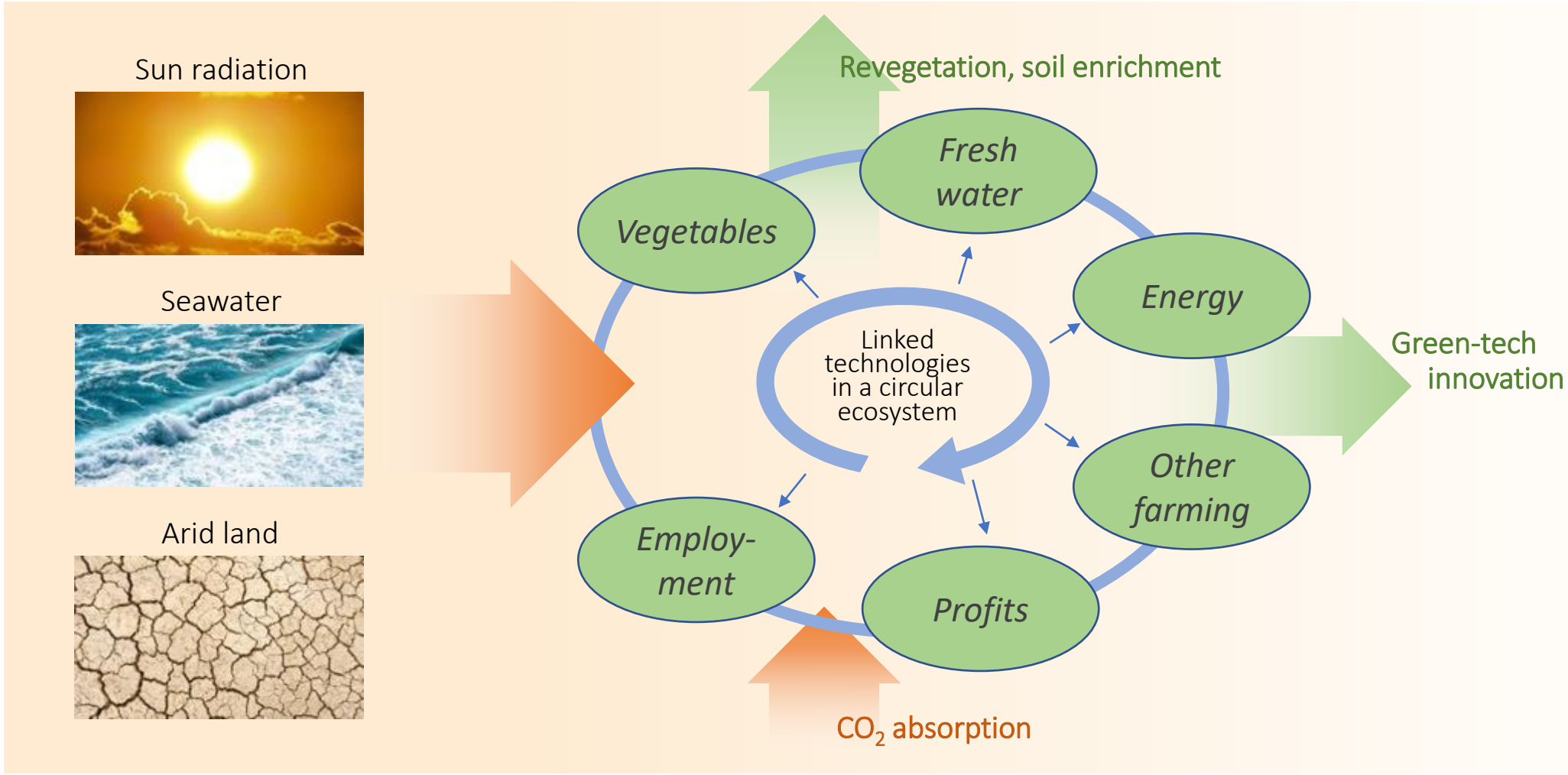
Vow Green Metals, BioCarbon & BioEnergy Day
Kjetil Stake, MD

“Revegetation and green jobs through profitable production of food, freshwater, biomass and electricity”

SAHARA FOREST PROJECT

Circular, sustainable replenishment of resources

The Sahara Forest Project addresses sustainable creation of resources in dry areas – with revegetation, CO2 capture and local prospering as consequential effects



Current status: 2x verified

Commercial scale-up targeted for 2020

SAHARA FOREST PROJECT

2012: The Qatar Pilot Facility

2017: The Jordan Launch Station

2010: First partnerships

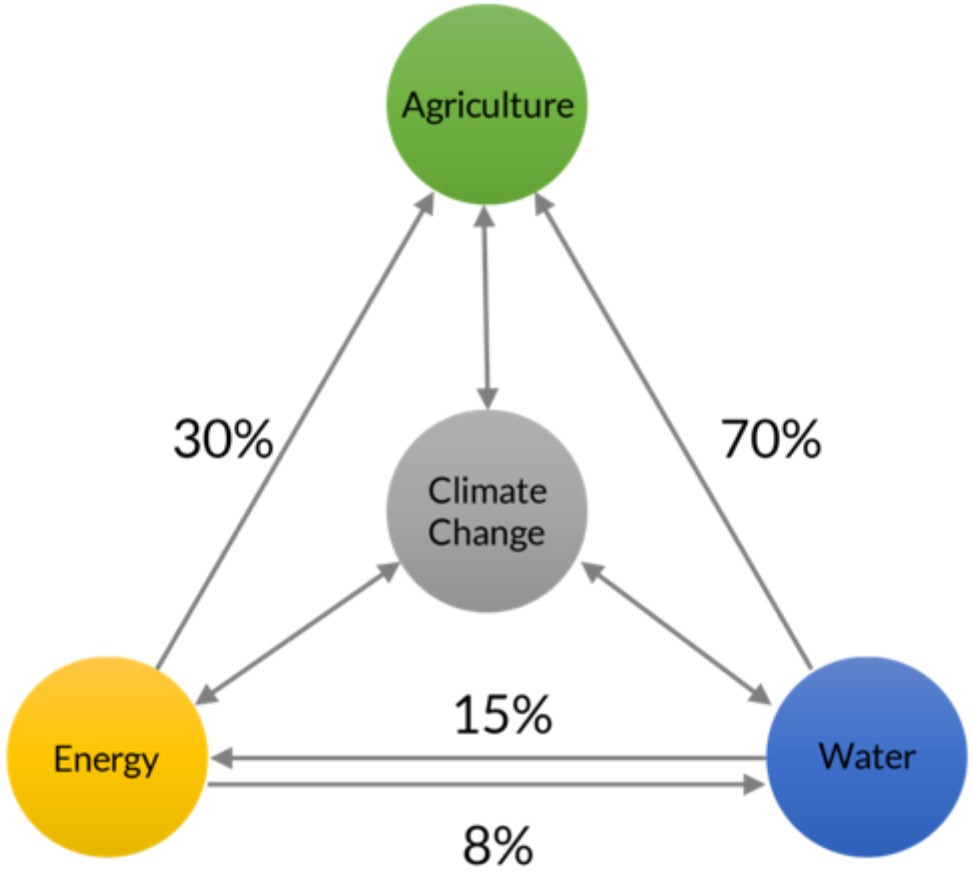
2012: Construction of pilot

2017: Jordan launch station

2020: Commercial scale-up

NEXUS | FOOD, WATER AND ENERGY

- Agriculture contributes 30% of world's greenhouse gas emissions.
- Agriculture sector most affected by climate change.
- Risk that 122 million more people will be undernourished by 2030 due to climate change.



 200 km

The Sahara Forest Project Launch Station in Aqaba

Using solar power, desalination and saltwater cooled greenhouses to produce climate smart vegetables

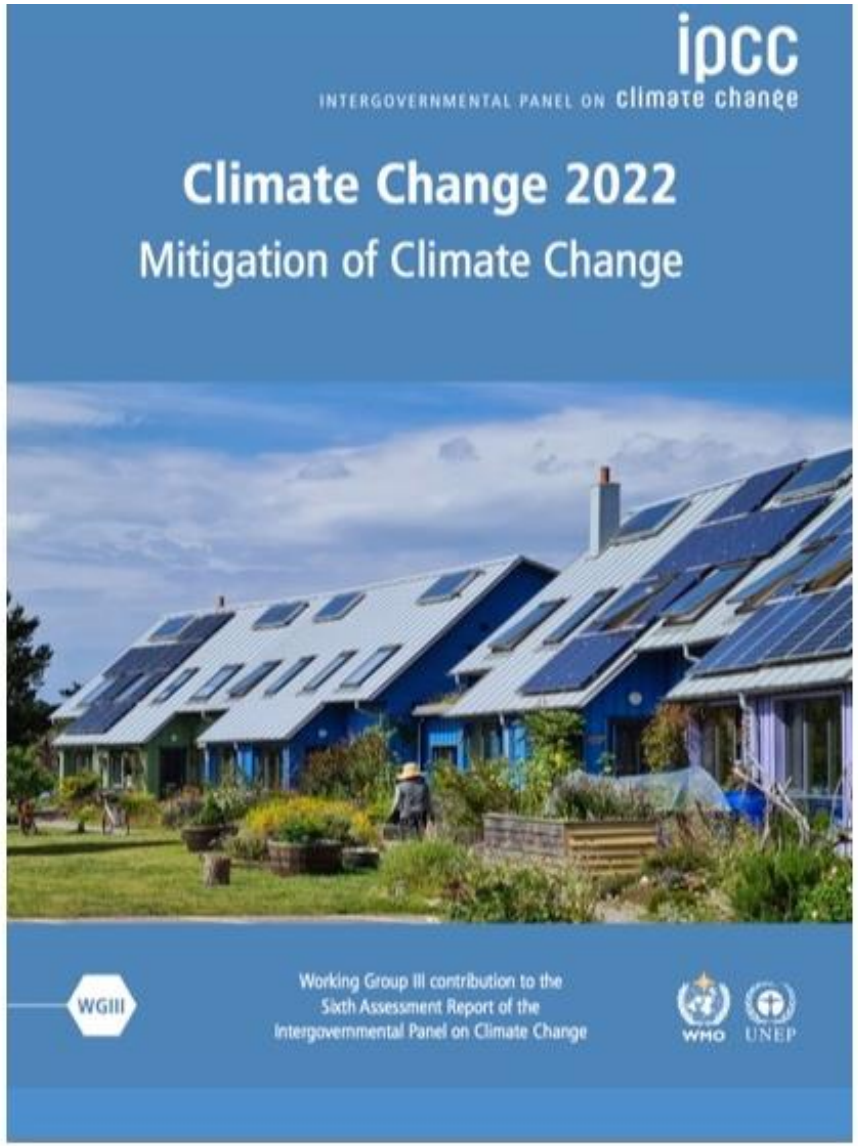
SAHARA FOREST PROJECT

Growing in innovative facilities using biological pest control

Trial exports to Bama in Norway – quality ensured

....while at the same time revegetate local areas for carbon storage in biomass

Sahara Forest Project Case Study in most recent IPCC report



Finally, there are knowledge gaps in the literature particularly in relation to policy scalability and in relation to the extent and magnitude of policy interactions when scaling the policy to a level consistent with low GHG emissions pathways such as 2ºC and 1.5ºC.

START BOX 12.6 HERE

Box 12.6: Case Study, Sahara Forest Project in Aqaba, Jordan

Nexus Framing

Shifting to renewable (in particular solar) energy reduces dependency on fossil fuel imports and greenhouse gas emissions, which is crucial for mitigating climate change. Employing renewable energy for desalination of seawater and for cooling of greenhouses in integrated production systems can enhance water availability, increase crop productivity and generate co-products and co-benefits (e.g., algae, fish, dryland restoration, greening of the desert).

Nexus Opportunities

The Sahara Forest project integrated production system uses amply available natural resources, namely solar energy and seawater, for improving water availability and agricultural/biomass production, while simultaneously providing new employment opportunities. Using hydroponic systems and humidity in the air, water needs for food production are 50% lower compared to other greenhouses.

Technical and Economic Nexus Solutions

Several major technologies are combined in the Sahara Forest Project, namely electricity production through the use of solar power (PV or CSP), freshwater production through seawater desalination using renewable energy, seawater-cooled greenhouses for food production, and outdoor revegetation using run-off from the greenhouses.

Stakeholders Involved

The key stakeholders which benefit from such an integrated production system are from the water sector which urgently requires an augmentation of irrigation (and other) water, as well as from the agricultural sector, which relies on the additional desalinated water to maintain and increase agricultural production. The project also involves public and private sector partners from Jordan and abroad, with little engagement of civil society so far.

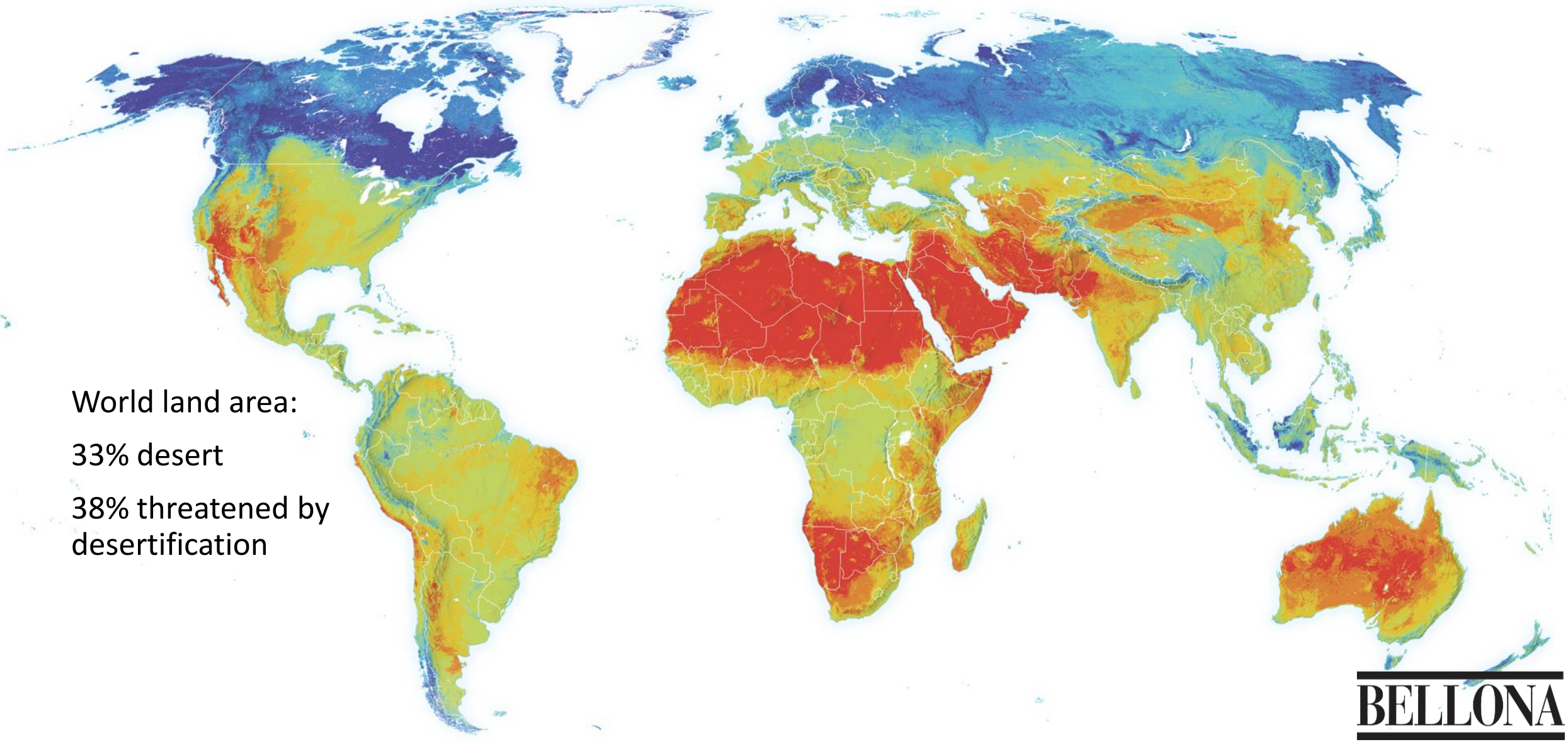
Framework Conditions

The Sahara Forest Project has been implemented at pilot scale so far, including the first pilot with one hectare and one greenhouse pilot in Qatar and a larger "launch station" with three hectares and two greenhouses in Jordan). These pilots have been funded by international organisations such as the Norwegian Ministry of Climate and Environment, Norwegian Ministry of Foreign Affairs and the European Union. Alignment with national policies, institutions and funding as well as upscaling of the project is underway or planned.

Monitoring and Evaluation and Next Steps

The multi-sectoral planning and investments that are needed to up-scale the project require cooperation among the water, agriculture, and energy sectors and an active involvement of local actors, private companies, and investors. These cooperation and involvement mechanisms are currently being established in Jordan. Given the emphasis on the economic value of the project, public-private partnerships are considered as the appropriate business and governance model, when the project is up-scaled. Scenarios for upscaling (seawater use primarily in low lying areas close to the sea, to avoid energy-intensive pumping) include 50MW of CSP, 50 hectares of greenhouses, which would produce 34,000 tons of vegetables annually, provide employment for over 800 people, and sequester more than 8,000 tons of CO2 annually.

The world has a desertification problem



World land area:

33% desert

38% threatened by desertification

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Desertification has multiple consequences

Climate

- When an area turns into desert, the soil carbon is released into the atmosphere, contributing to global warming

Food insecurity

- Loss of topsoil, crop failure, reduced yields
- Loss of vegetation cover → less food for livestock and humans

Loss of biodiversity & habitable areas

- Worsening living conditions for many species, loss of forest covers and shortage of biological resources

Decrease in drinking water resources

- Loss of aquifiers, less biomass to retain water

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Desertification can be reversed by turning waste into a resource - capturing CO_2 and creating new green jobs

- Revegetation is possible by using desalinated seawater and biological waste to cultivate plants
- With time and coordinated land-use management, revegetated ares can expand
- New sustainable industries can be built by utlizing revegetated biomass
- Desert regions can become carbon sinks by capturing and storing large quantities of CO_2 in plants and soil

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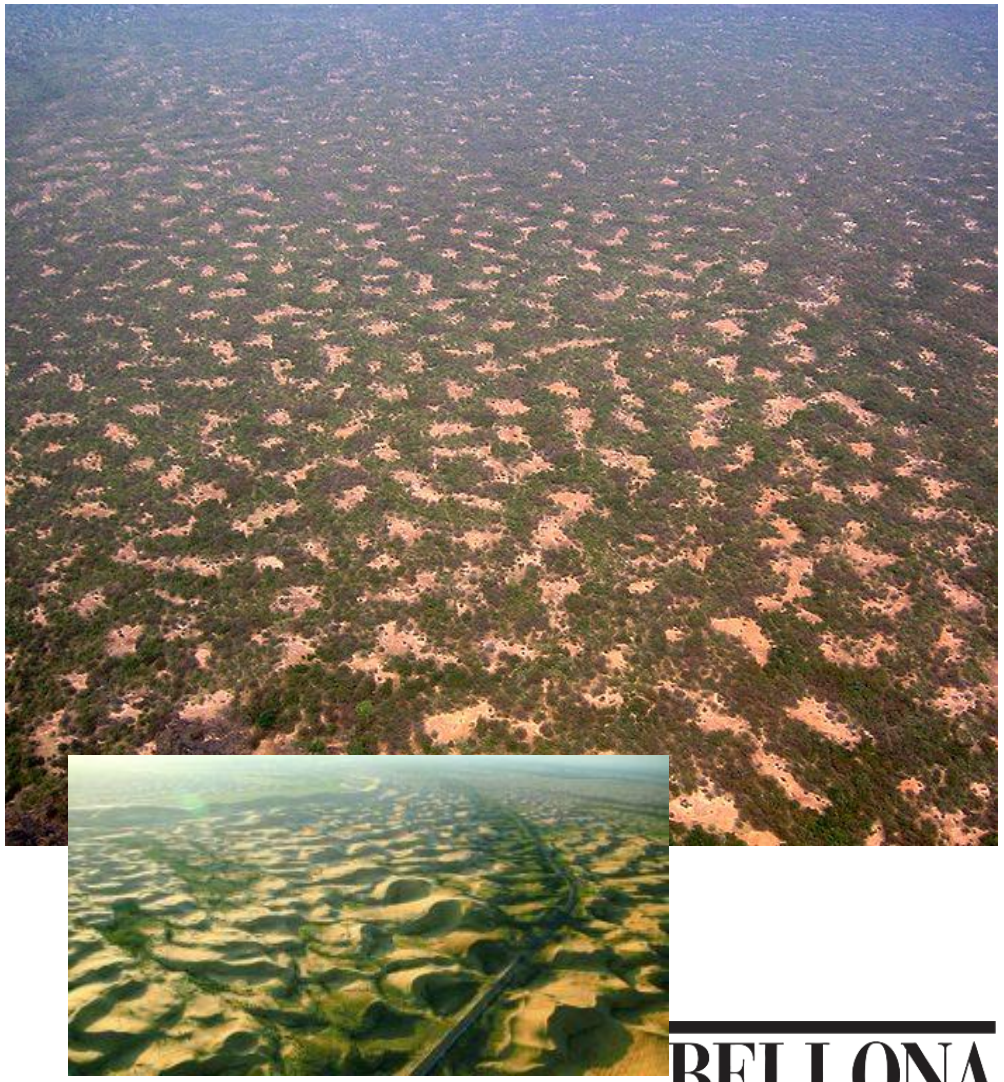
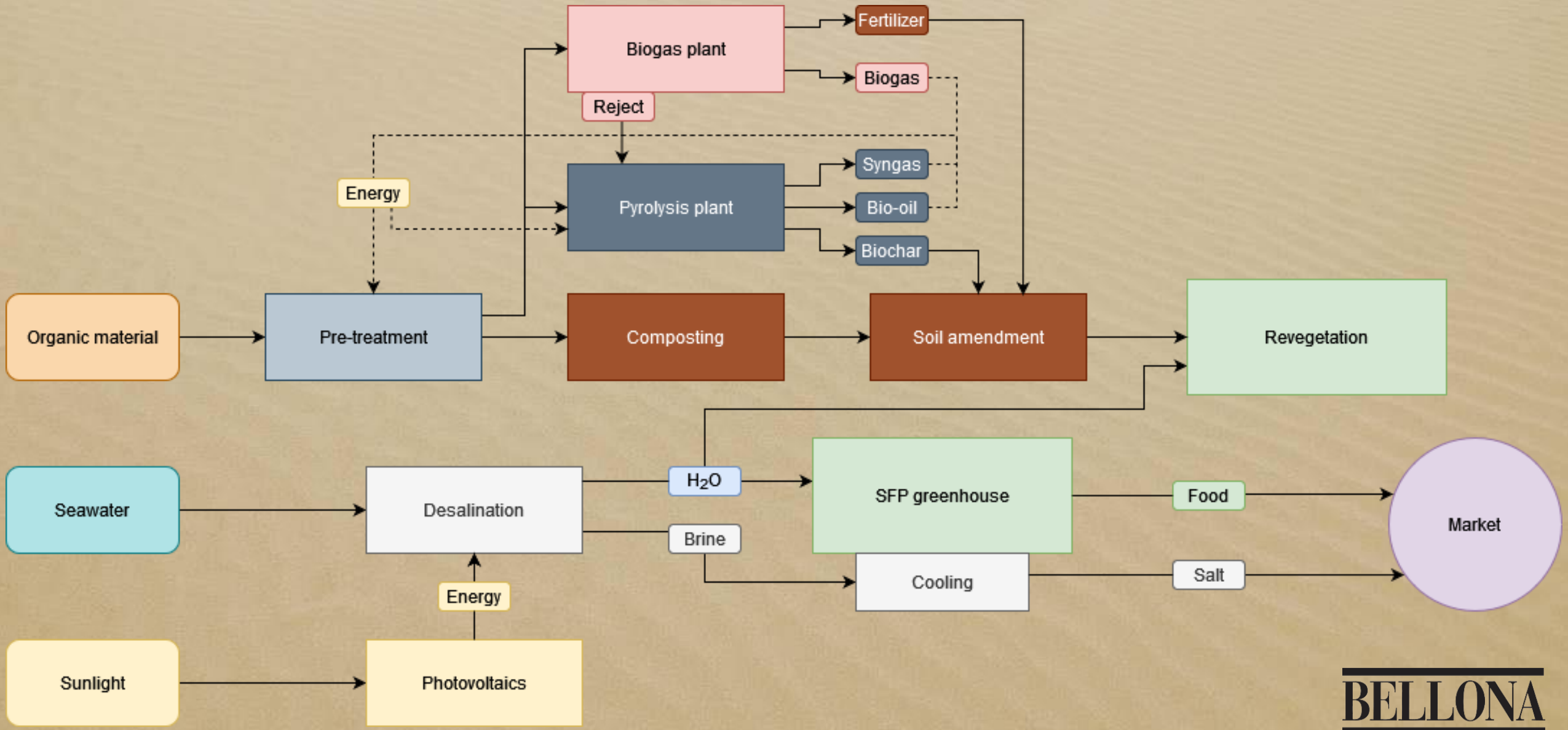
Benefits of revegetation

- Carbon sequestration
- Improved water cycle
- Stabilizing temperatures
- Reduced erosion & stabilized soil
- Increased biodiversity & life-supporing ecosystems
- Increased resistance to drought & extreme weather
- Formation of arable land
- New industries and technologies
- New green jobs



Pyrolysis & biogas implementation



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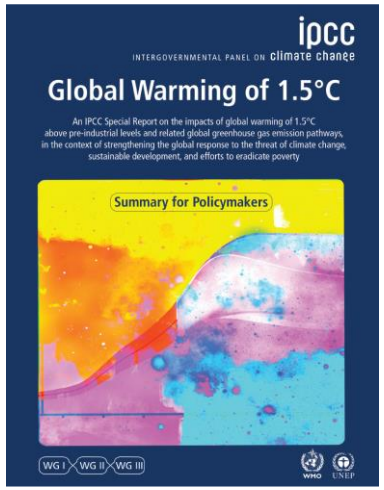
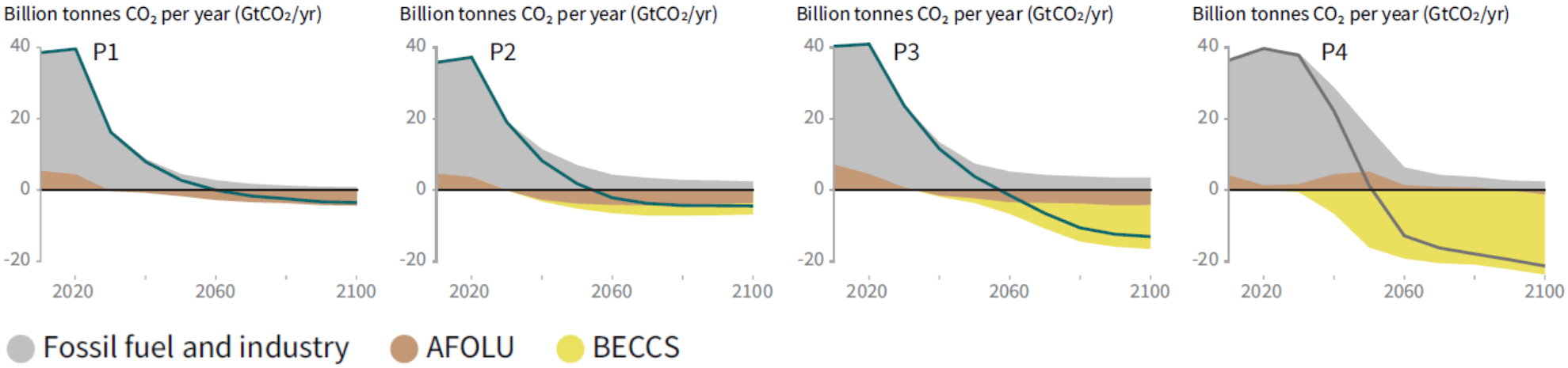
Carbon removals are a necessary supplement to emission reductions

Afforestation and other carbon removals play an important part in the scenarios limiting global warming to below 2 °C





Deep and rapid emissions reductions are also essential

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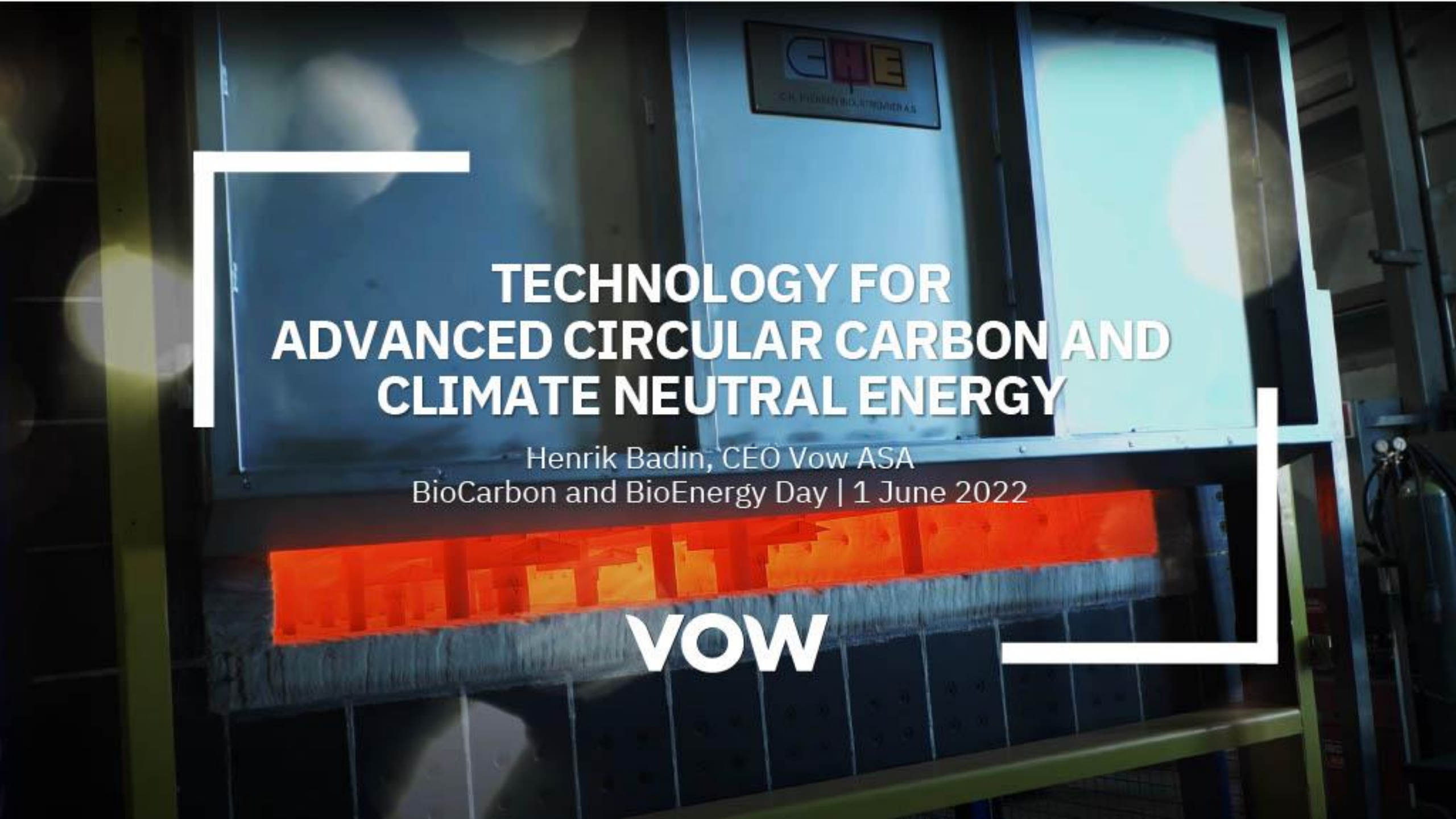
SAHARA
FOREST
PROJECT



TECHNOLOGY FOR ADVANCED CIRCULAR CARBON AND CLIMATE NEUTRAL ENERGY

Henrik Badin, CEO Vow ASA

BioCarbon and BioEnergy Day | 1 June 2022

VOW

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The presentation includes and is based, inter alia, on forward-looking information and statements that are subject to risks and uncertainties.

In addition, important factors that could cause actual results to differ materially from those expectations include, among others, economic and market conditions in the geographic areas and industries that are or will be major markets for Vow's businesses, market acceptance of new products and services, changes in governmental regulations, interest rates, fluctuations in currency exchange rates and such other factors as may be discussed from time to time in the Presentation.

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ABOUT US

- Provider of world leading technologies to **eliminate pollution**, enhance **circular economy** and mitigate **climate change**
- Offering **patented unique solutions** that turn waste and biomass into **CO2 neutral** energy, **decarbonised** energy, **low-carbon** fuels and **biocarbon**
- **Proven ability** to continually **develop and deliver** technology and equipment for complex **industry scale solutions** and applications, in close **co-operation with customers**
- **Strong backlog** of orders and **large installed base** for leading players in a wide range of industries, providing **recurring business**

VOW

Our brands

SCANSHIP for cleaner oceans

Biogreen

CHE

ETIA ECOTECHNOLOGIES

ASCODERO PRODUCTIQUE

VOW BY NUMBERS

117
patents
within 17 families of patents

4450+
systems
installed[1]

144
systems in backlog
to be delivered over the next 3-5 years

Net-zero
ambition by 2025
209 tCO_2e in Scope 1 and 2

45
proprietary technologies
and 35 proprietary technology applications

220
employees
with operations in six countries: Norway France Poland, US, Canada and Italy

0
serious incidents
Sick leave at 1.4%y

25%
gender equality target by 2025
Compared with 14% in 2021

[1] Of which 290 systems are installed on 130 cruise ships, 60 systems within landbased, waste and biomass valorisation, 100 systems with food processing and 4000+ CH Evensen systems

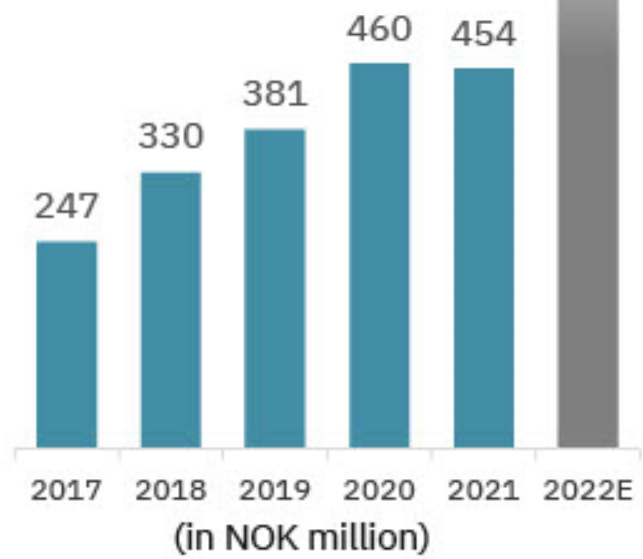
VOW

PROOF OF SUCCESS

Revenues

Steady growth, despite some covid-19 effects

Expected to nearly double in 2022

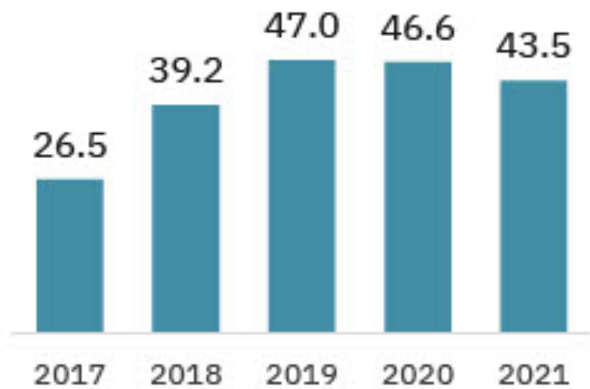


(in NOK million)

EBITDA

Stable and strong

Supporting profitable growth

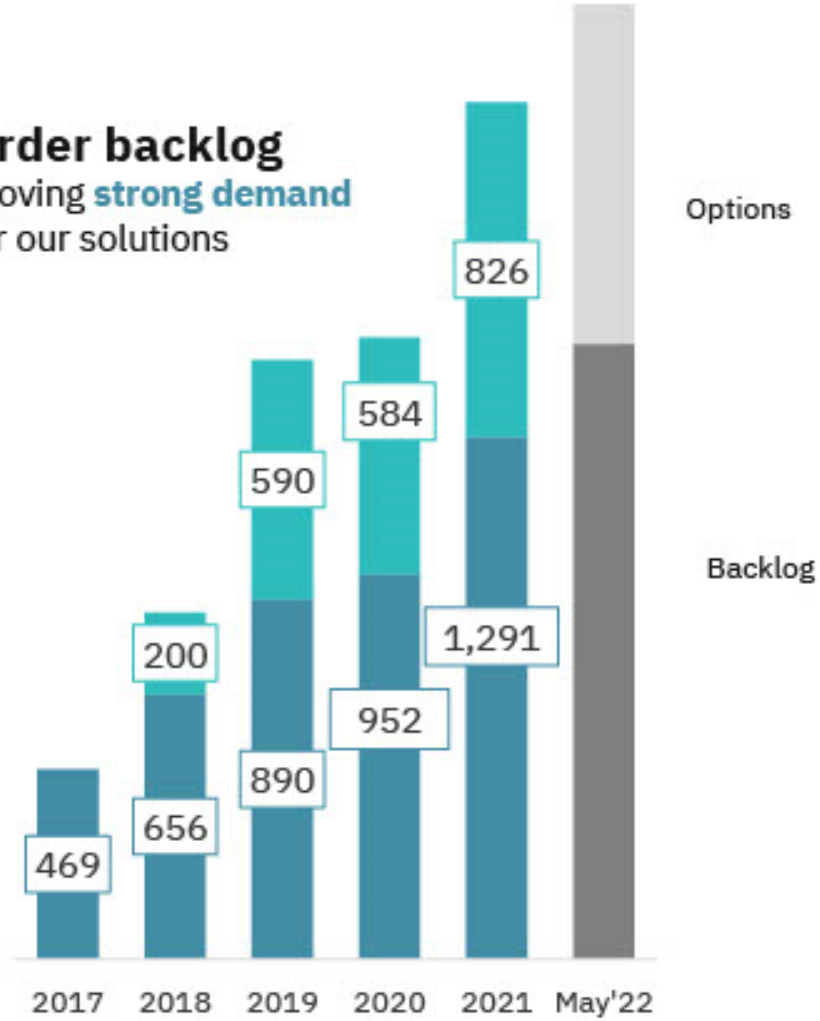


(in NOK million)

Before non-recurring items

Order backlog

Proving **strong demand** for our solutions



(in NOK million)

May'22 numbers are estimates based on Q1 actuals and contracts recently announced

BUILDING A LEADING POSITION THROUGH PARTNERSHIPS

From sea based to landbased in two decades

Recent partnerships
(names undisclosed)

- Global non-ferrous metals producer
- US state-wide renewable energy provider

THE CORE OF OUR VALUE PROPOSITION

We aspire to deliver excellence – over and over again

VOW

SOLUTIONS & TECHNOLOGIES

VOW

COMPLEMENTARY PYROLYSIS TECHNOLOGIES

Microwave assisted pyrolysis (MAP)

Well suited for processing of organic waste and production of clean energy, for instance on board a cruise ship

Biogreen

For production of sophisticated and advanced biocarbon, needed for instance by the metallurgical and advanced materials industries

C.H. Evensen reactor

For processing large volumes of biomass, such as forestry waste and waste wood, and production of clean energy and biochar

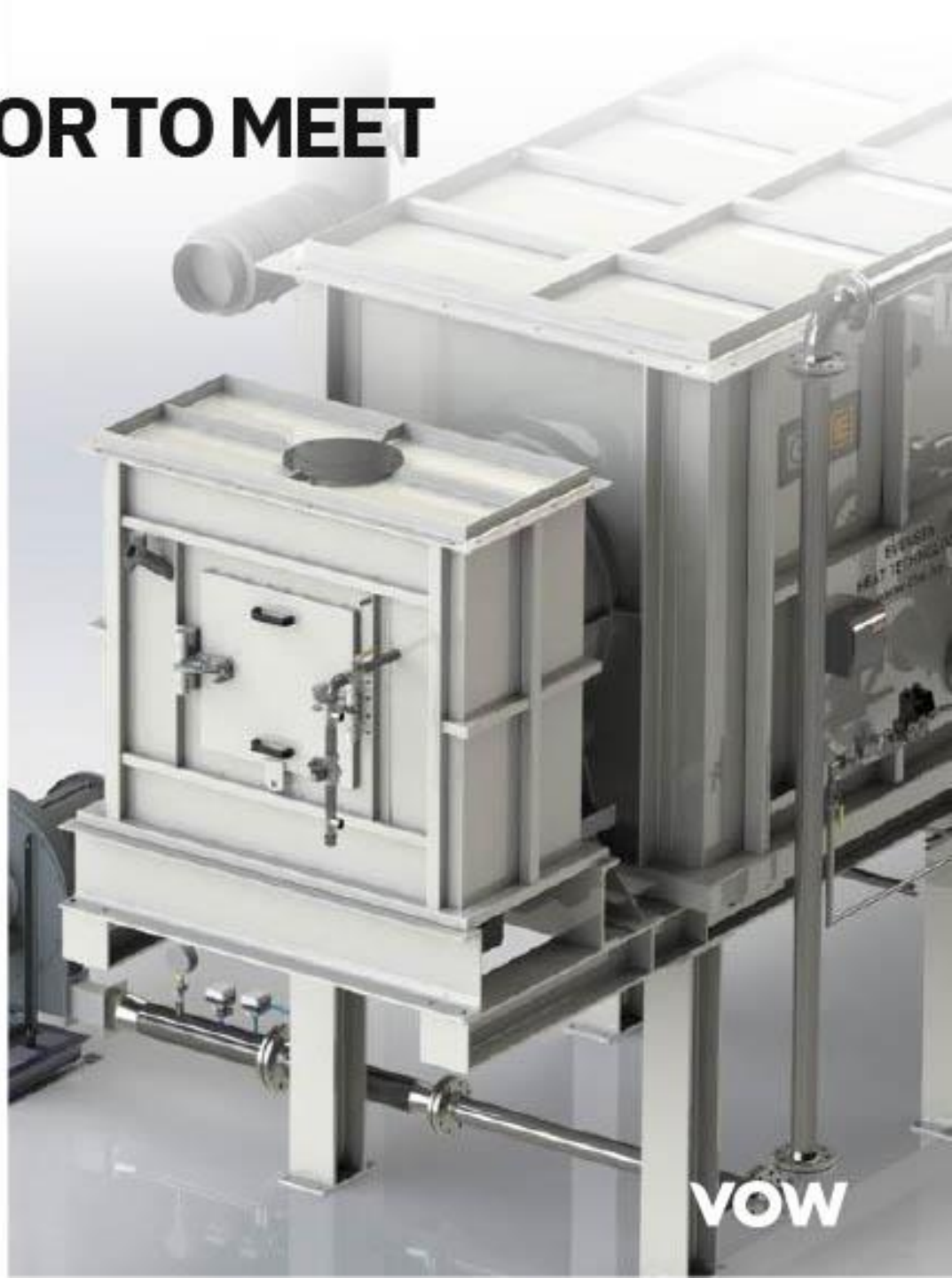
CHE + Biogreen

Two-step process with several Biogreen units connected to each Evensen reactor to further multiply output

VOW

INTRODUCING THE CHE REACTOR TO MEET INCREASED DEMAND

- With growing demand from industry customers to decarbonise, recycle carbon, and to secure access to reliable and locally produced CO_2 neutral energy, Vow decided to start building a large-scale pyrolysis reactor for production of biocarbon and syngas
- The reactor is built by C.H. Evensen and will be completed and available by the end of 2022
- The CHE Reactor is based on well-known and proven technology. It is a combined reactor, in the sense that the energy required to fuel and run the process comes either from the feedstock itself or from electricity
- In an application based on forestry residues, the reactor will produce up to 100 GWh of syngas and 10,000 tonnes of biocarbon per year



THE 50,000-TONNES BIOCARBON PROJECT

Equivalent to 5x initial production capacity at Follum project and **EUR 85-100 million** worth of Vow technology
A **large-scale project in the circular economy**, feeding a leading European non-ferrous metal producer with biocarbon

Sustainable feedstock

- Forestry wood mass
- Biomass waste streams
- Wood materials

50,000 tonnes
CO2 neutral biocarbon,
replacing the equivalent of
EUR 37 million
of fossil coking coke

300 GWh
CO2 neutral syngas,
replacing the equivalent of
EUR 32 million
in fossil natural gas

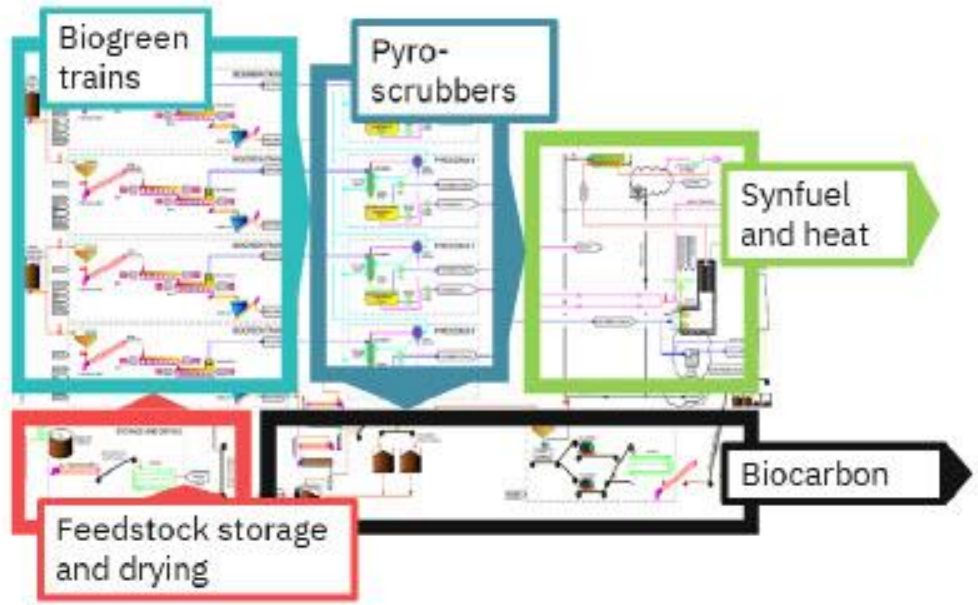
VOW

LANDMARK LANDBASED CONTRACT

At USD 27 million[1] the largest ever landbased contract

- Contract signed in May 2022 with undisclosed US renewable energy company, for delivery of industry scale biocarbon production system
- Building on Scanship's proven delivery model and ETIA's BioGreen technology. Engineering starts immediately
- Timing of subsequent stages in the project are pending government permits and final design
- Biocarbon to be sold in several markets now under development by US partner
- In addition to direct revenue from sale of biocarbon, the partnership will produce carbon credits

[1] *Not included in order intake and backlog referred earlier in this presentation*



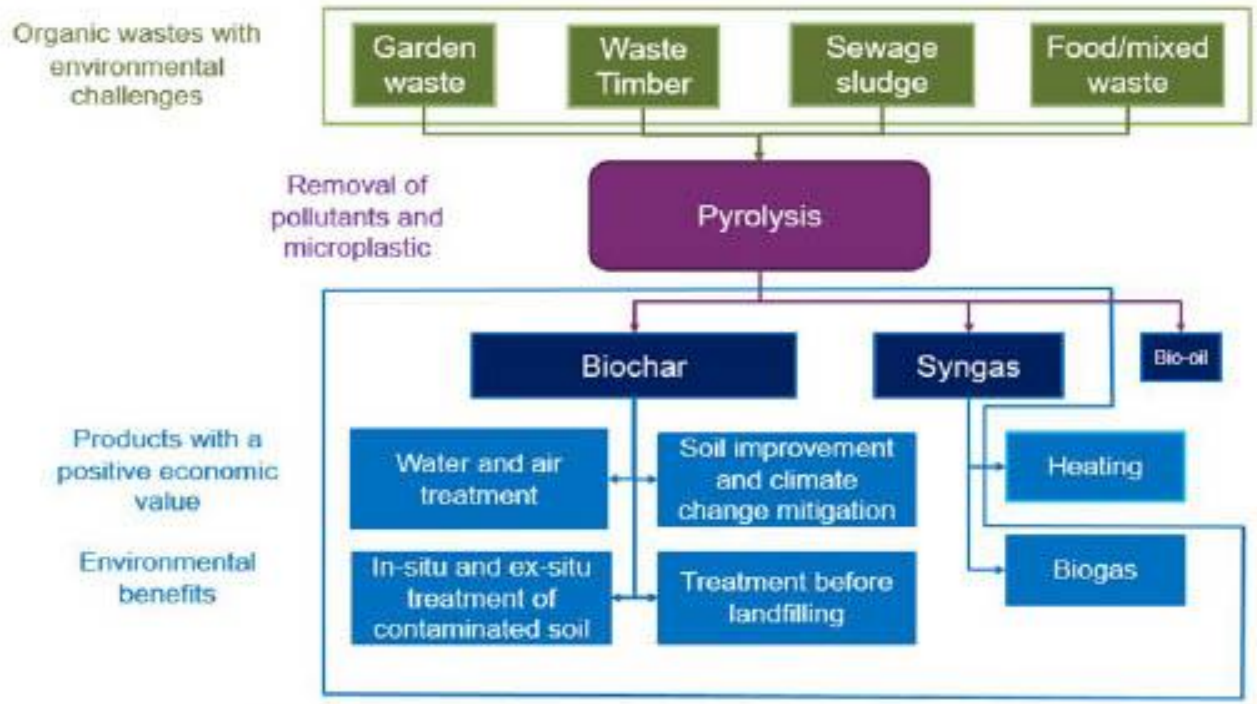
Features four state-of-the-art BioGreen lines, upstream and downstream processing, systems for storage, drying, shredding of feedstock, and cooling and bagging system

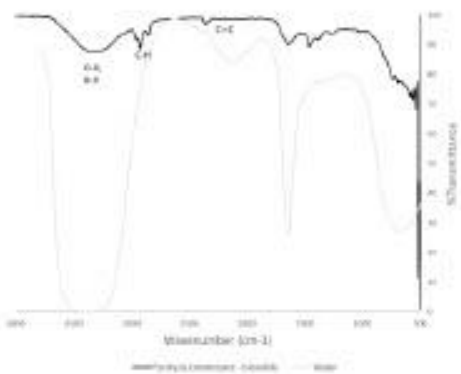
Note: Illustration does not show the actual plant configuration currently being planned

INNOVATION LAB

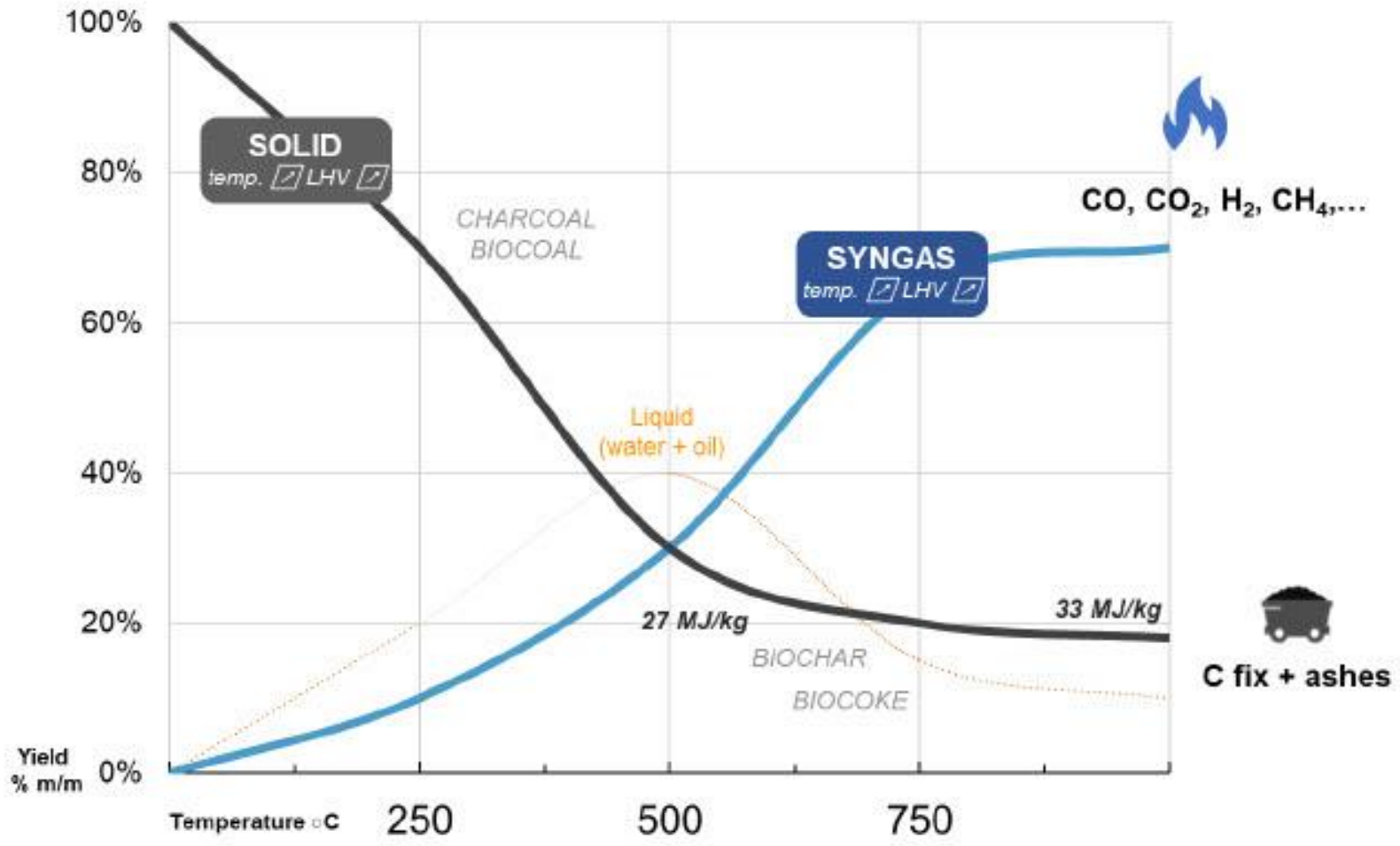
A very strong team

- Large testing infrastructure
- Well connected with academia
- Fast track from idea to large scale pilots





FINE-TUNED PROCESSING CONDITIONS



PRE-PROCESSING FOR PYROLYSIS

Thermal treatment of sludge and food waste for improved dewatering
–> 50% reduction in dryers

Superheated Steam Dryer with heat pump
-> 70% reduction in heat for dryers

VOW

POST PROCESSING FOR PYROLYSIS

Activated biochar

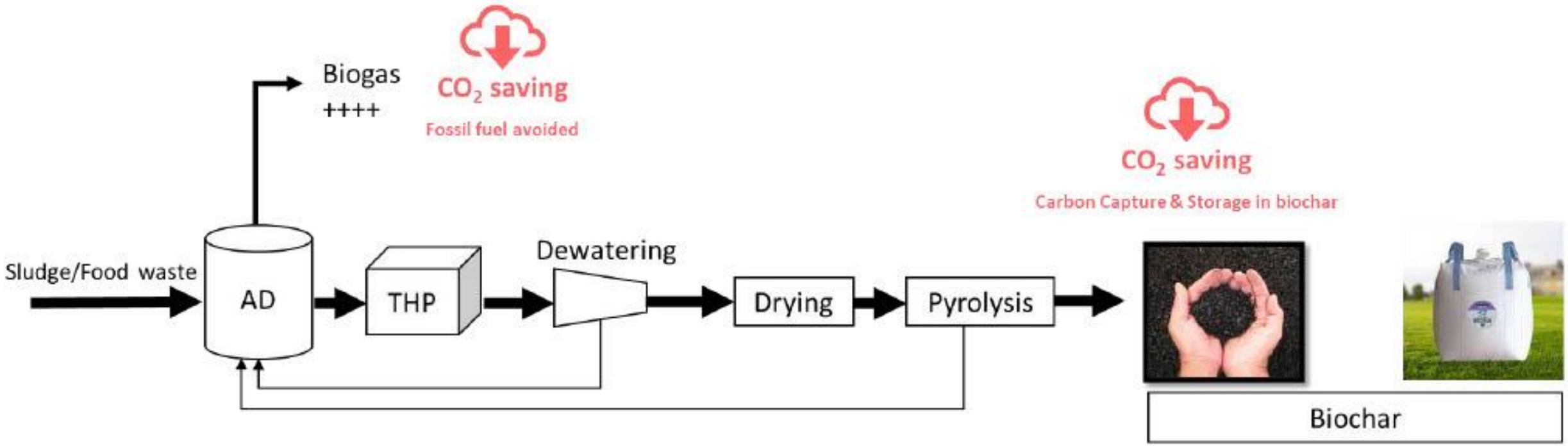
Sorbents for organic pollutants

Biocarbon agglomeration

VOW

INCREASED BIOGAS PRODUCTION

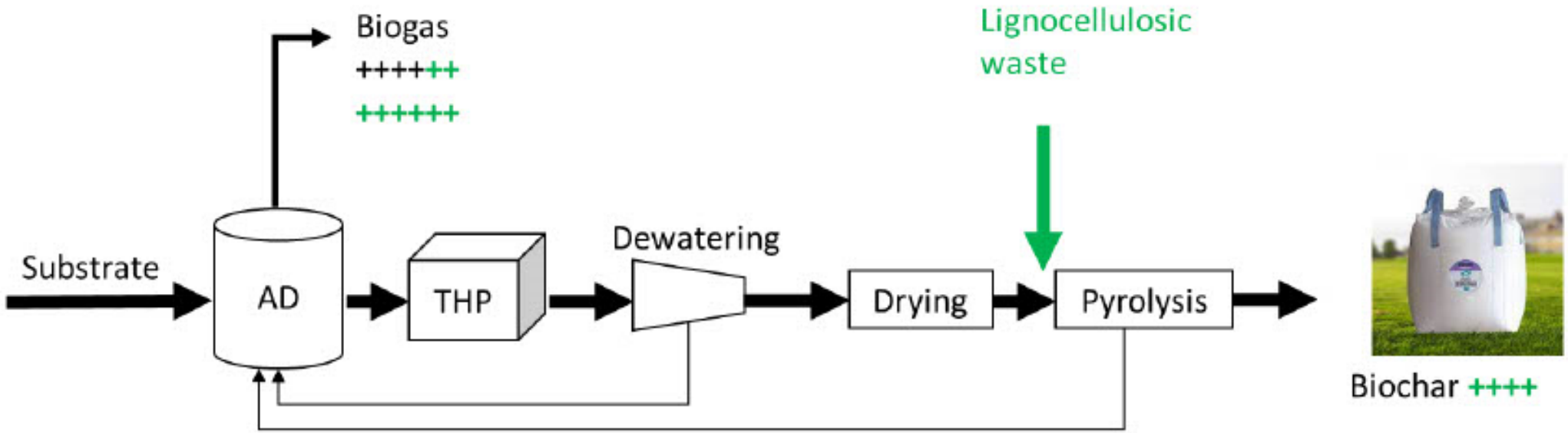
elimination of pollutants & saving CO_2



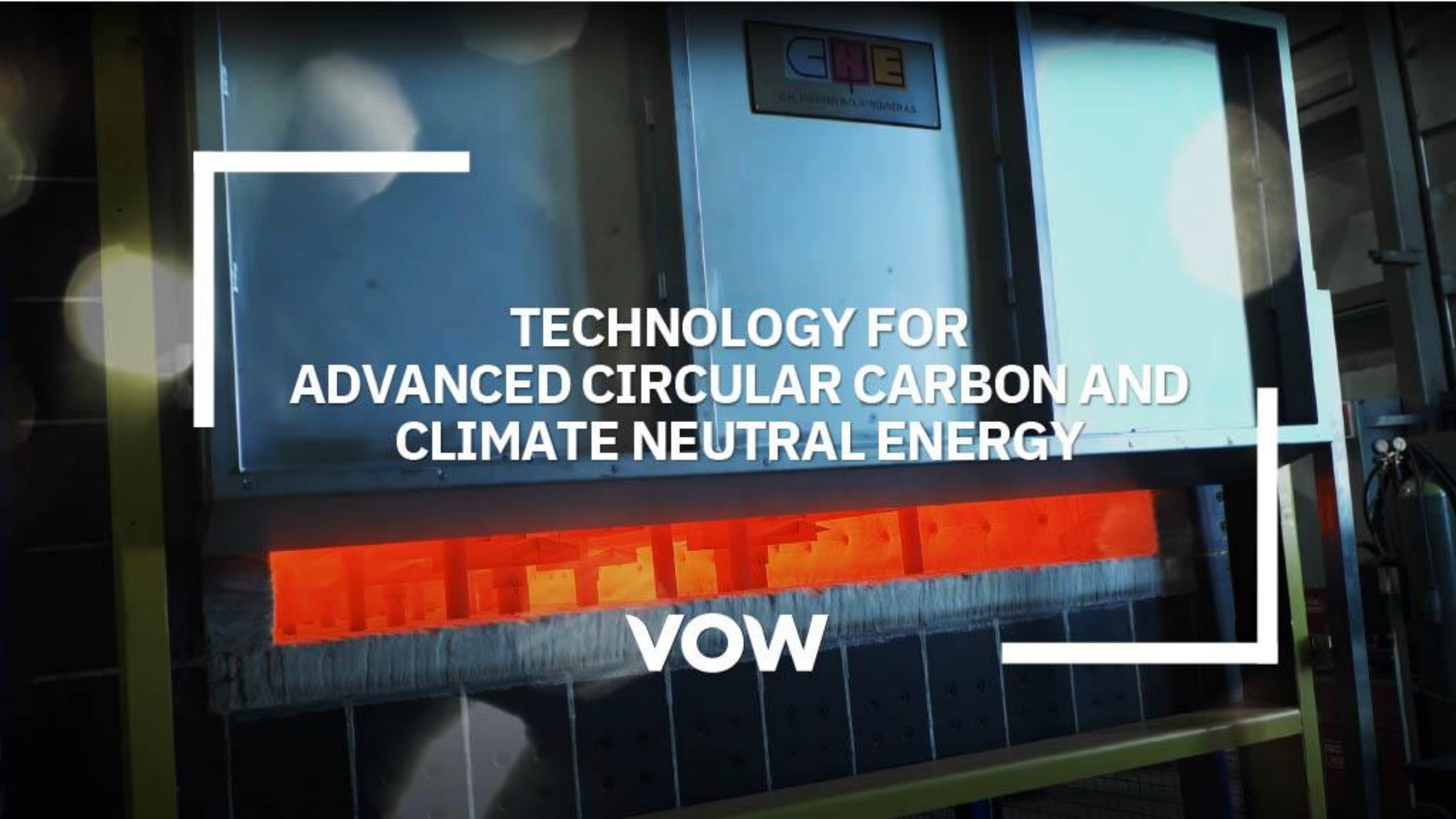
VOW

INCREASED BIOGAS PRODUCTION

by addition of lignocellulosic material to pyrolysis



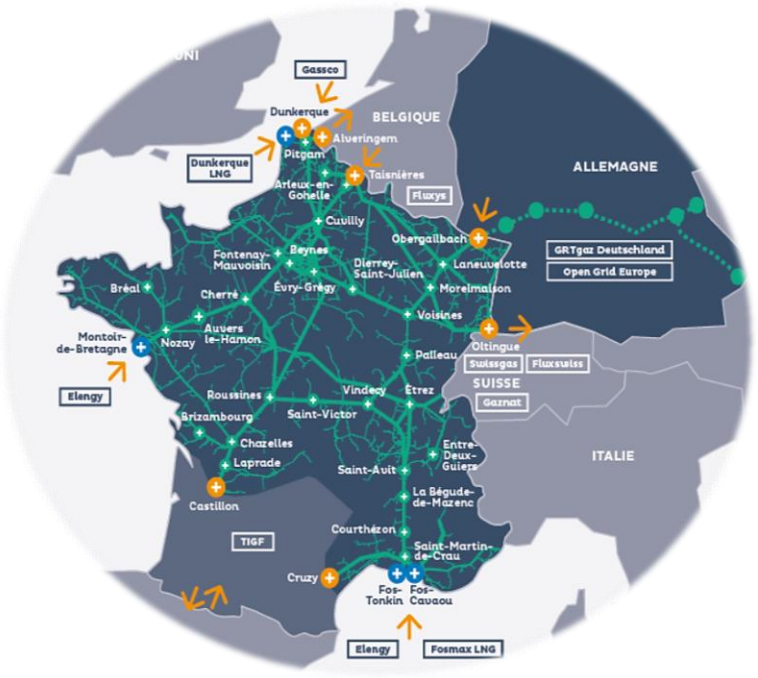
VOW


TECHNOLOGY FOR
ADVANCED CIRCULAR CARBON AND
CLIMATE NEUTRAL ENERGY
VOW

Green gas development prospect in Europe

June 1st, 2022

GRTgaz, a committed player in the energy transition



Transmission network in France

Transmission network in Germany

Interconnections with adjacent networks

Compressor stations in France

Compressor stations in Germany

Gas flow

LNG terminals and adjacent TSO

Gas transportation in France

33 680 km
of pipelines

641 TWh / year
of gas tranported

155 shipping customers

716 industrial customers

19 managers of distribution networks connected

46 biomethane producer customers

GRTgaz and the energy transition

Anaerobic digestion,
Pyrogasification,
Hydrothermal gasification,
Hydrogene

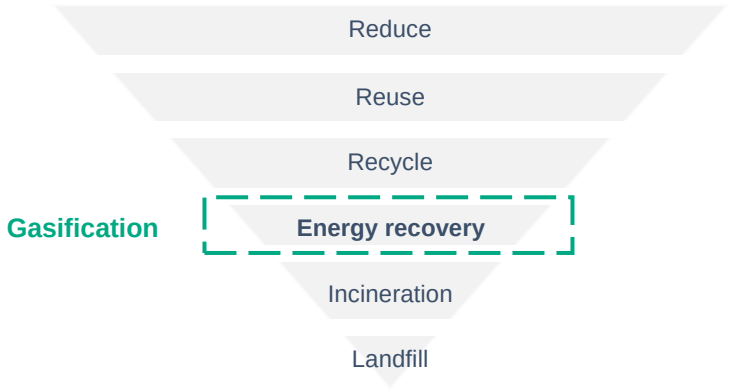
France has adopted carbon neutrality objectives

Today, residues that are not recycled are burned, sent to landfill or exported

China has decided to no longer be the dumping ground for the world and so **to ban all solid waste imports** since the 1rst of january 2021. French exported ~200 kt of plastic waste and needs to find new ways for waste valorization.

50% — **Reduction of waste sent to landfill** by 2025 (Loi de Transition Énergétique pour la croissance verte, August 2015)

> 70% — The **minimum share of waste** that cannot be reused must find energy recovery by 2025 (Loi AGEC, sept. 2021)



Hierarchy for waste management

France has set itself ambitious objectives within the framework of the energy transition and in line with the European dynamic

10% — **Renewable gas consumption** by 2030 (Loi de Transition Énergétique pour la croissance verte, August 2015)

100% — The objective of **carbon neutrality** included in the loi Energie-Climat by **2050** (November 2019)

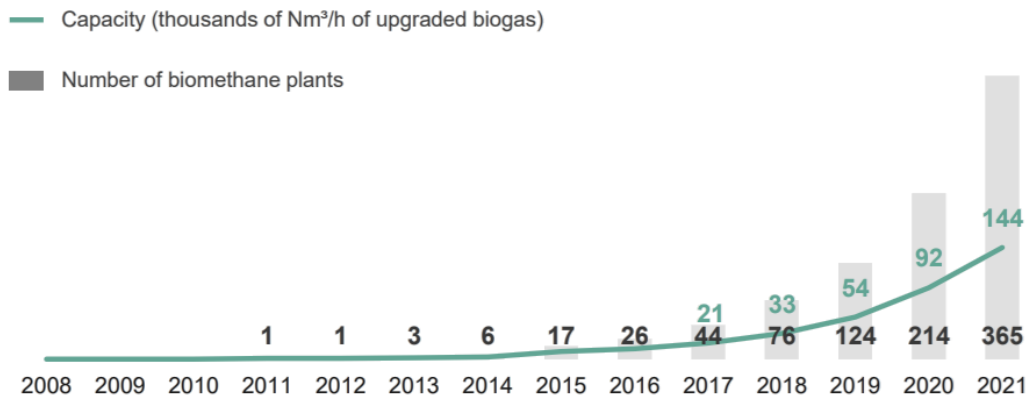
Gasification brings solutions for **facing waste / biomass residues management** and for the **decarbonation of the gas mix**

France is speeding up green gas production

Biogas production by anaerobic digestion raises according to an exponential curve

x2

The share of anaerobic digestion in the energy mix doubles every year and forecasts show growth up to 2030



Capacity and number of biomethane plants in France[1]

The required feedstocks for anaerobic digestion are different from pyrogasification inputs. There is no competition of uses.

Biogas production by pyrogasification brings along with a strong potential of positive externalities: forecast 2030

3 Mt of waste / year

Turned into gas by gasification

1 Mt / year

Reduction of CO2

500 000 dwellings
or
35 000 buses

[1] *6th European Biomethane Benchmark Sia Partners may 2022*

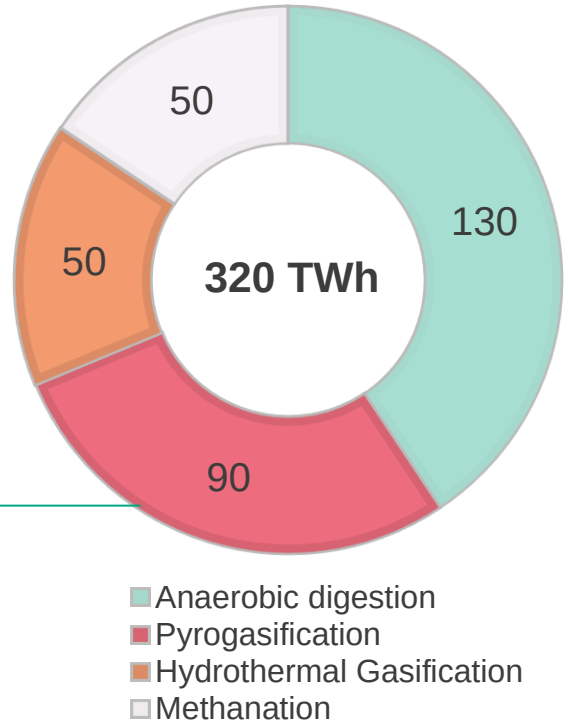
Renewable gas potential in France by 2050

- **France has sufficient potential to decarbonize the gas mix by 2050**

An achievable estimate of renewable and low-carbon methane production (excluding hydrogen) in France of 320 TWh by 2050 (anaerobic digestion, pyrogasification, hydrothermal gasification and methanation).

Analysis by french operators based on available studies (Ademe, Solagro, France Strategy, Enea).

Estimated production of renewable and low-carbon methane in France by 2050
(in TWh excluding hydrogen)



Pyrogasification

- **90 TWh: the trajectory of methane production from pyrogasification** by 2050, considering the respective challenges of heat, gas and liquid fuel carriers

Favorable reglementary framework in Europe

- **The European Climate Law, in July 2021, affirms in binding legislation the EU commitment to climate neutrality and the intermediate objective reflected in the Fit for 55 in 2030 approach.**

-55 %	Adoption of proposals to adapt EU policies to reduce net GHG emissions by at least 55% by 2030 compared to 1990 levels.
40 %	The RED III will raise the production target of share of energy produced from renewable sources by 2030.
45 %	The REPowerEU plan will raise the target up to 45% of share of energy produced from renewable sources by 2030[1]

- **European biogas and biomethane production Today**

18 bcm	In 2020, biogas and biomethane production in the EU[1]

- **Building on the Fit for 55 package of proposals, the REPowerEU plan puts forward an additional set of actions to:**

35 bcm	Increase sustainable biomethane production to 35 bcm by 2030: included anaerobic digestion, pyrogasification, hydrothermal gasification,…
125 bcm	Support biogas and biomethane production up to 125 bcm by 2050

REPowerEU plan address the main barriers to increase sustainable biomethane production and use and to facilitate its integration into the EU internal gas market.

[1] *REPowerEU with Biomethane, EBA, 2022*

Policy and regulations for green industrial transition

01.06.22

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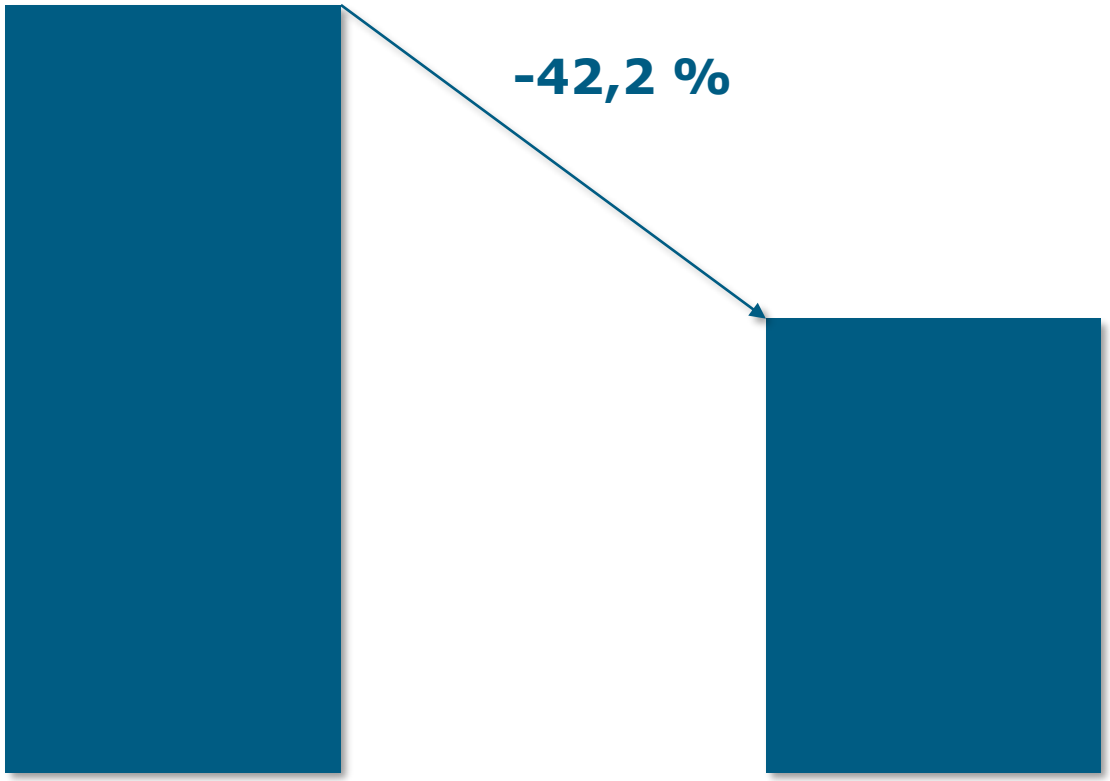
-42,2 %

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BELLONA

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REGULATION and AGREEMENTS

ECONOMIC MEASURES

COLLABORATION and FACILITATION

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1 North Sea Agreement

- Historic achievement in laying down a precautionary principle for protection of the North Sea
- Reducing emissions of environmental toxins, such as dioxins and hazardous waste but also phosphorous and nitrogen
- Important for development of environmental regulations

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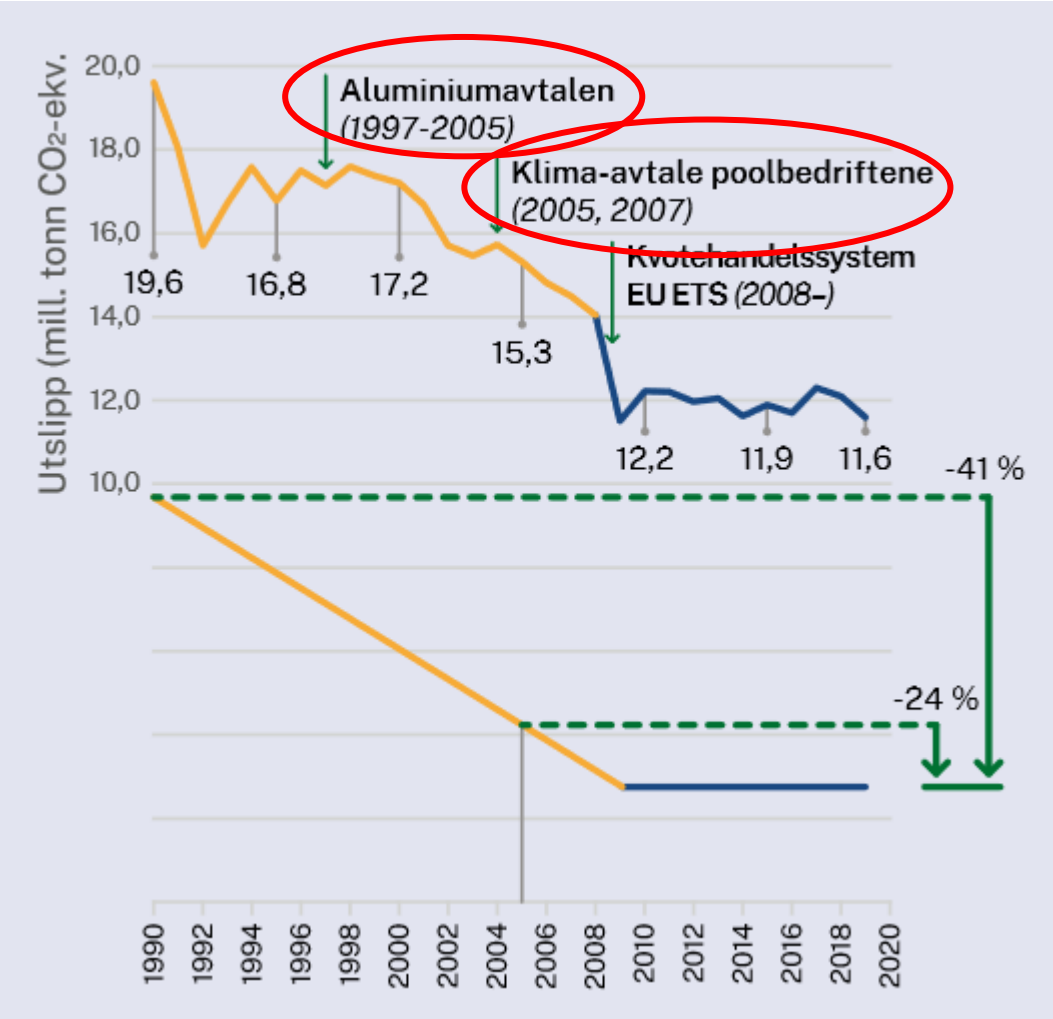
Partnerships

- Early environmental gains based on partnerships with industry
- Strong partnerships also gave key GHG emissions reductions
- Trend now of bringing back these partnerships with binding agreements to reductions



Figur 43 – Illustrasjon som viser reduksjonen i klimagassutslipp fra industri og bergverk. Som viser nedgang på 41 % siden 1990 og 24 % siden referanseåret for EU ETS (2005). Reduksjonen i perioden frem til 2008 kommer primært som følge av Aluminiumavtalen som adresserte potente klimagasser. Etter 2009 er utslippene stabile.

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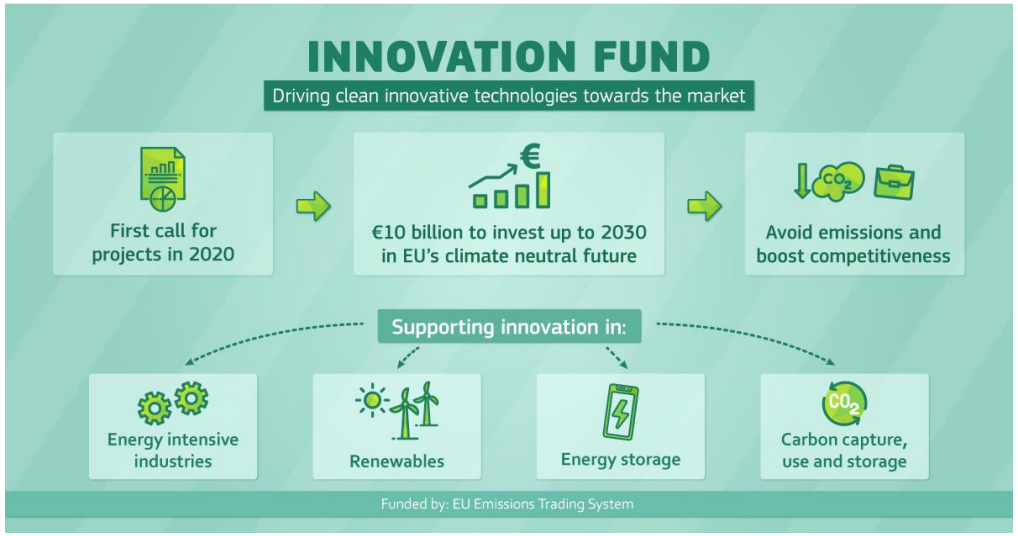
1 Ban on landfilling organic waste

- Major 2006 regulatory change in the ban of depositing organic waste at landfills
- From 2009 this released major biogenic waste streams
- Used in large part to substitute oil use in industry

2 EU ETS and more

- EU ETS caps emissions and creates a marketplace for trading of allowances
- Bellona proposed using income from ETS to fund investments in CCS (NER 300)
- This model became the blueprint for the Innovation Fund

European Commission



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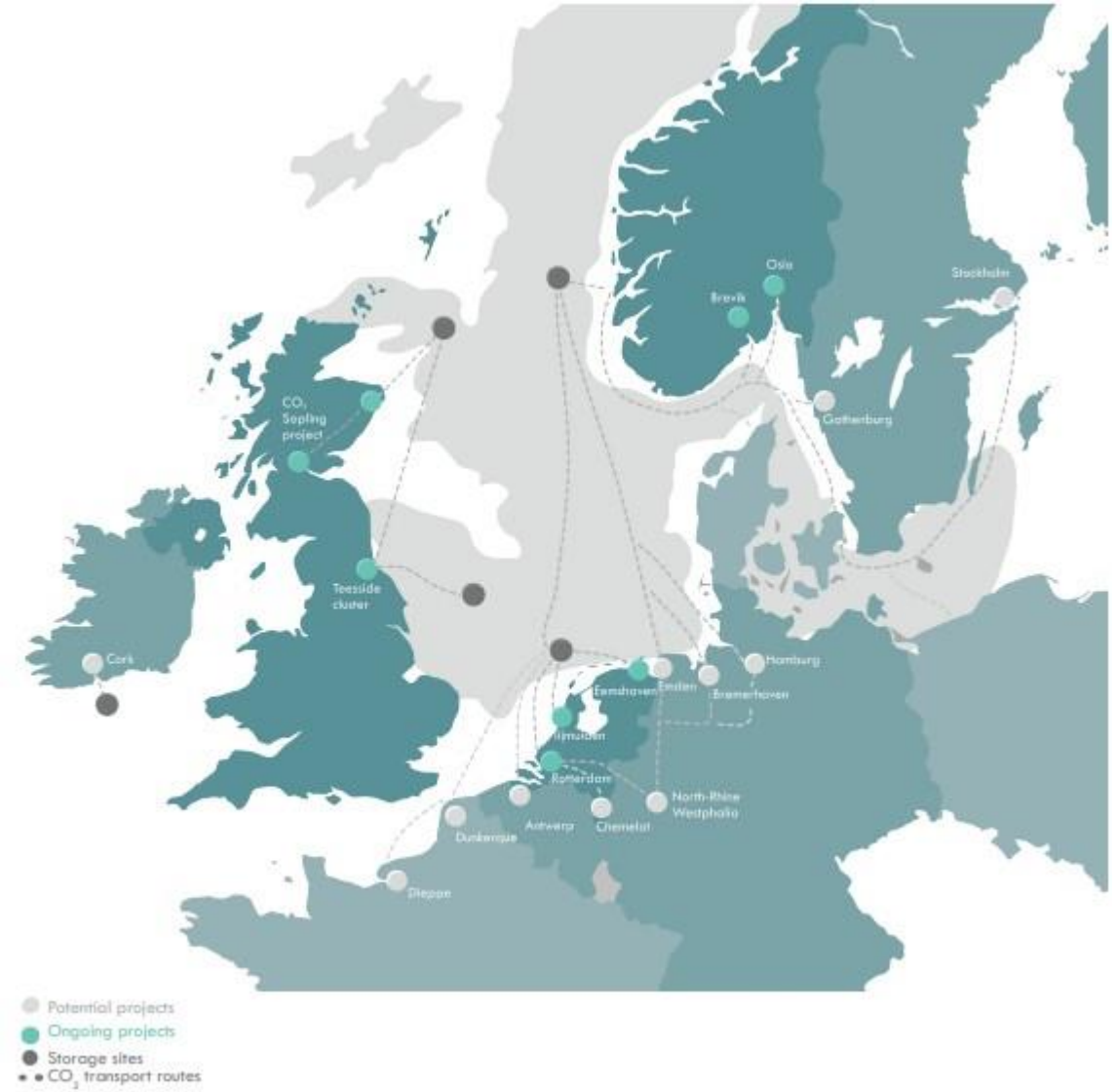
3 Building infrastructure (and trust)

- CCS a crucial technology for solving industrial process emissions
- Key issue has been lack of trust in that infrastructure will be developed timely, at scale, and accessible at low cost
- Longship a major step forward in this respect



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REGULATION and AGREEMENTS

ECONOMIC MEASURES

COLLABORATION and FACILITATION

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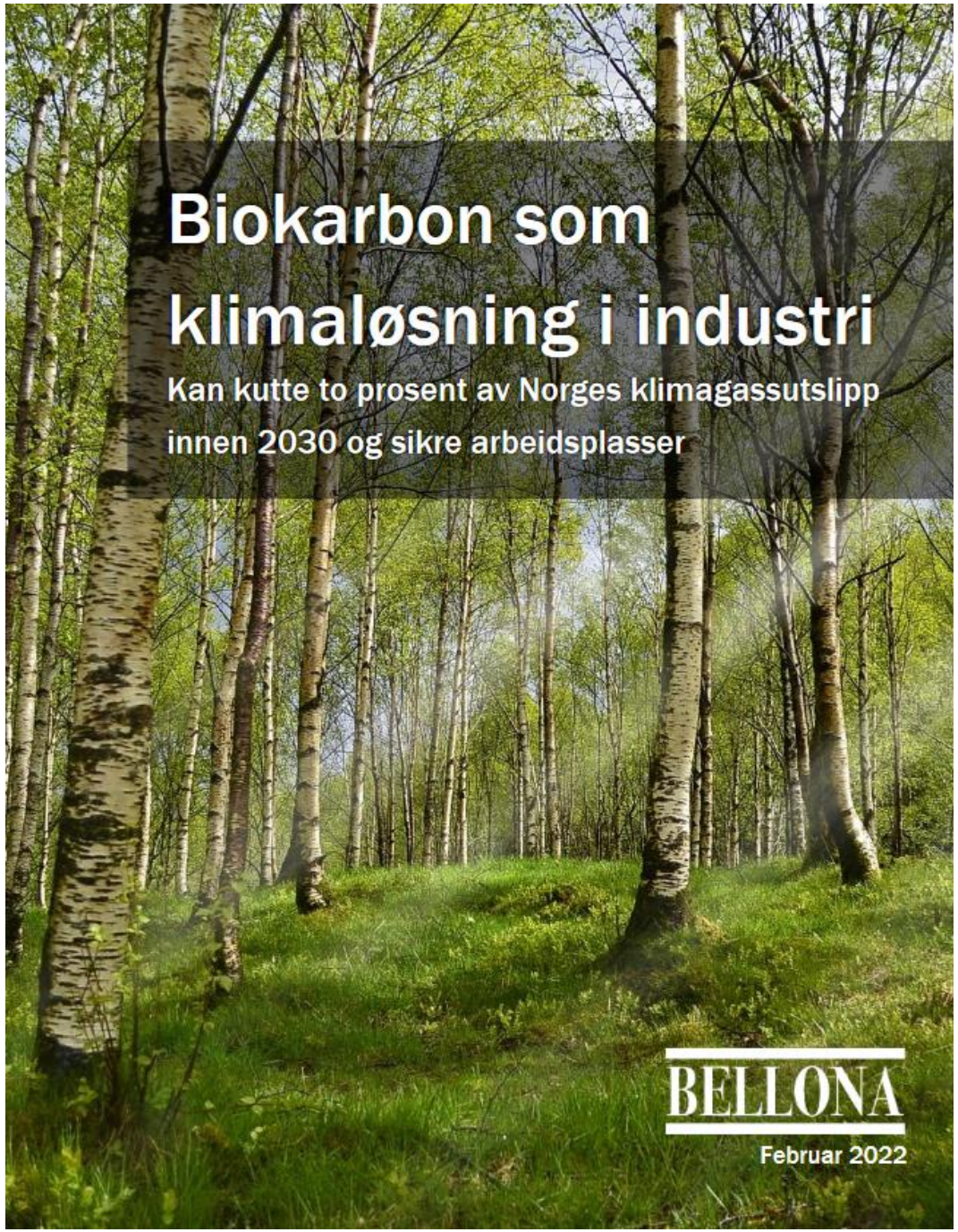
Biocarbon as climate solution

- Biogenic carbon key to reductions – and removals
- Replacement needed for industrial coal and coke use
- Pyrolysis can potentially also make a big difference in removing/stabilizing environmental toxins



Recommendations for biocarbon

1 Policy and regulation

- Ensure priority for biocarbon over other uses, such as biofuel
- Define a target and clear criteria for carbon removals

2 Economics

- Develop support schemes for biocarbon R&D and implementation
- Create new income through removals certificates

3 Collaboration and facilitation

- Drive new solutions for emissions reductions through partnerships
- Use public procurement to develop low-carbon products
- Develop infrastructure for transport and storage of CO2

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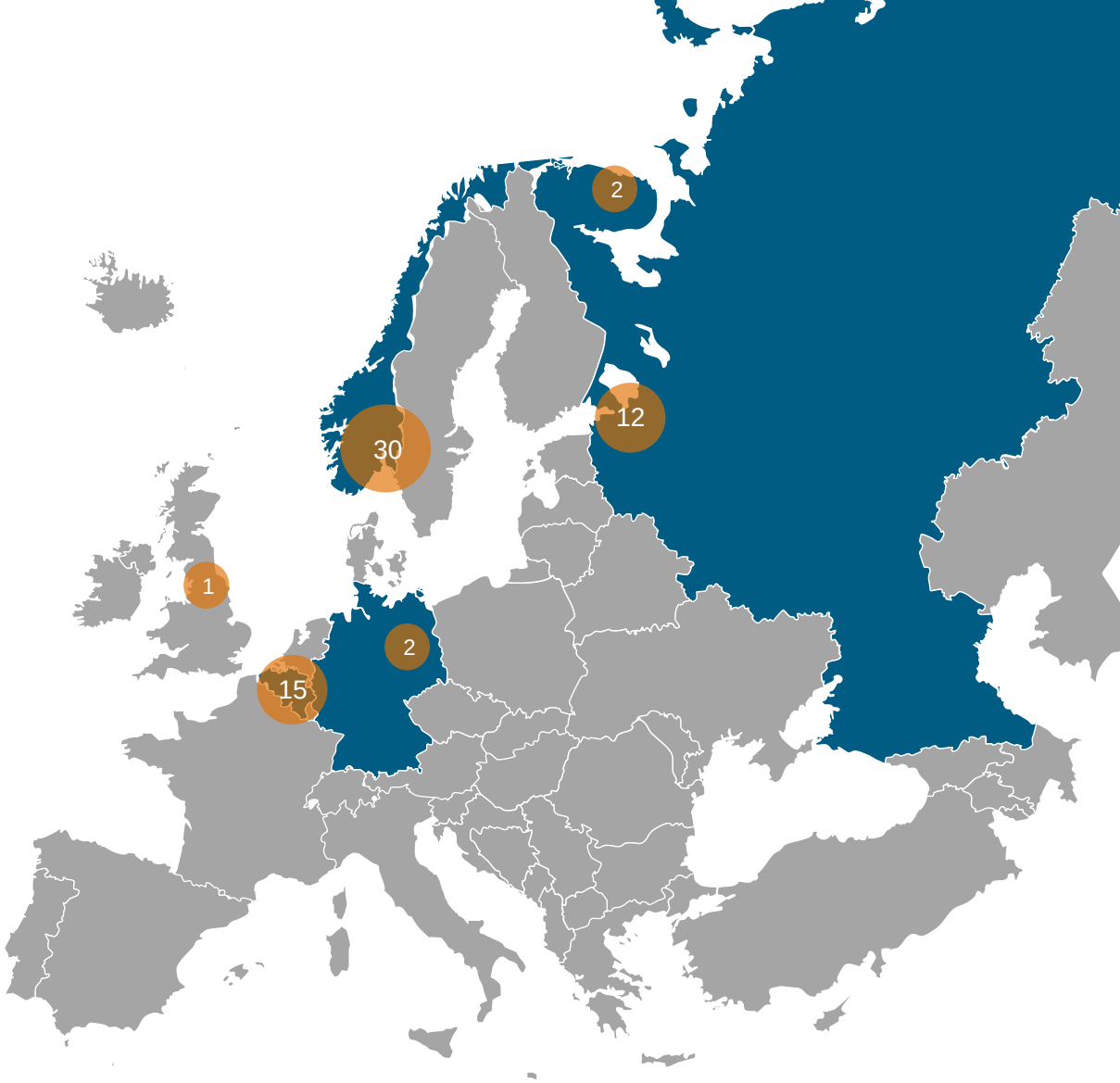
BELLONA IN BRIEF

Norwegian environmental NGO with a history of direct action, known for a solution- and system-oriented approach

Close collaboration with industry and policy makers to accelerate climate action

60+ employees across Norway, Belgium, Germany, UK, US, Russia



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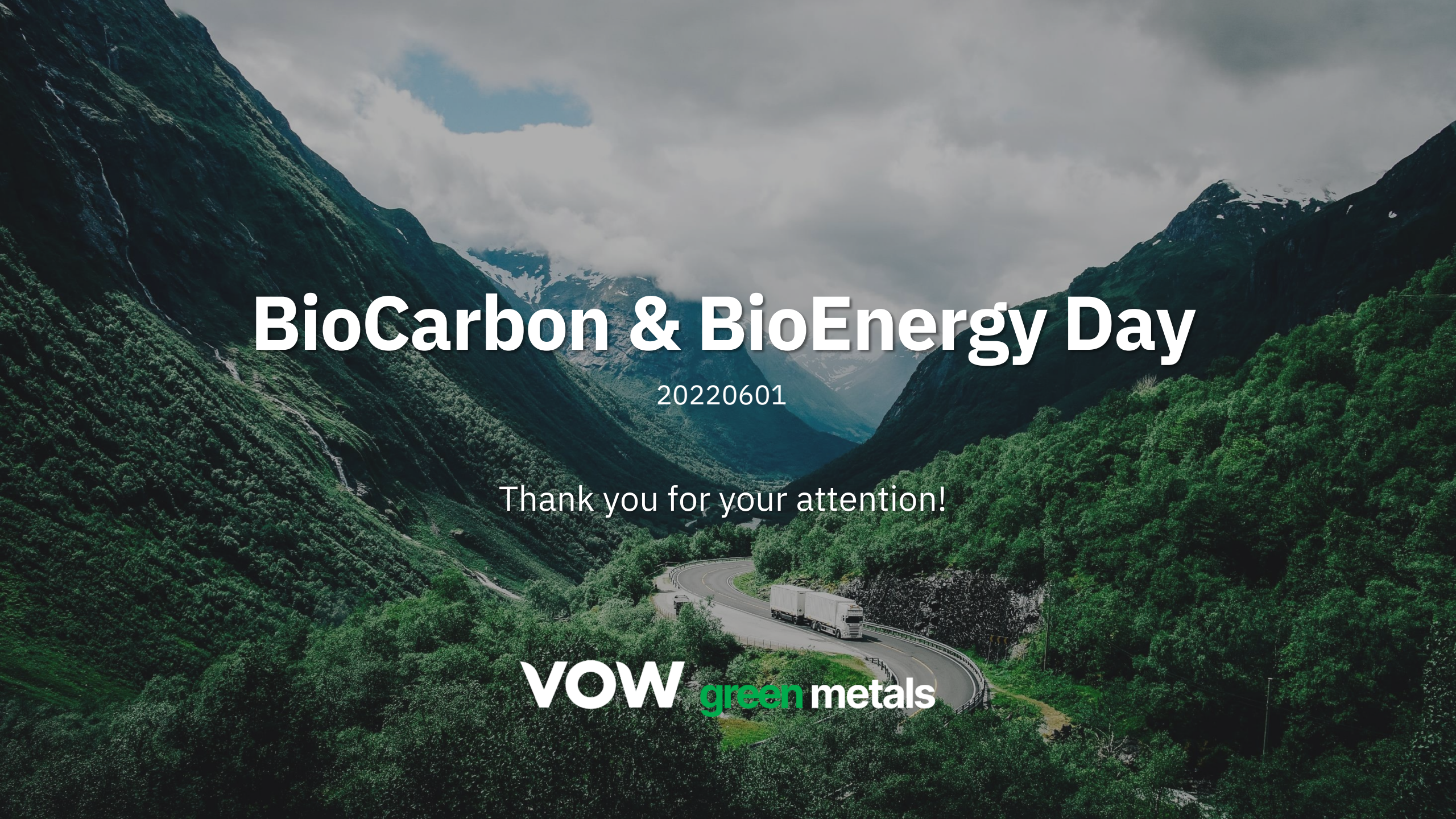
BioCarbon & BioEnergy Day
20220601
Thank you for your attention!
VOW green metals

Some highlights from the event

Industry push for decarbonising

Enabling technology

Circular economy

Biocarbon as a solution

Sustainable future

BILLERUDKORSNÄS

Elkem

GRTgaz

VOW green metals

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SAHARA FOREST PROJECT