



# Business model, businesses & strategy

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January 2024



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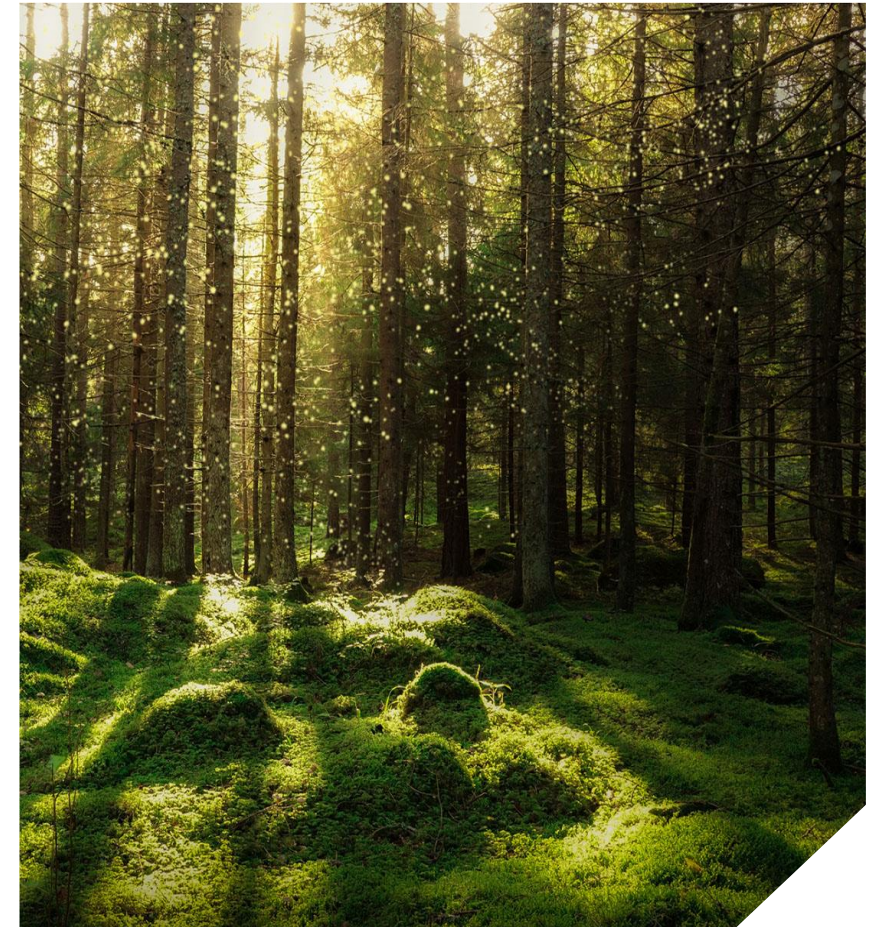
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# Borregaard is a global leader in biochemicals

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*High value added through full raw material utilisation  
Borregaard's biochemicals are sustainable and environmentally  
friendly substitutes for petrochemicals*

**SPECIALITY  
CELLULOSE  
& CELLULOSE  
FIBRILS**  
▲ 45% FIBRES



**BIOPOLYMERS  
& BIOVANILLIN**

▲ 30% LIGNIN  
(BINDING MATERIAL)

**BIOETHANOL**  
▲ 25% SUGARS

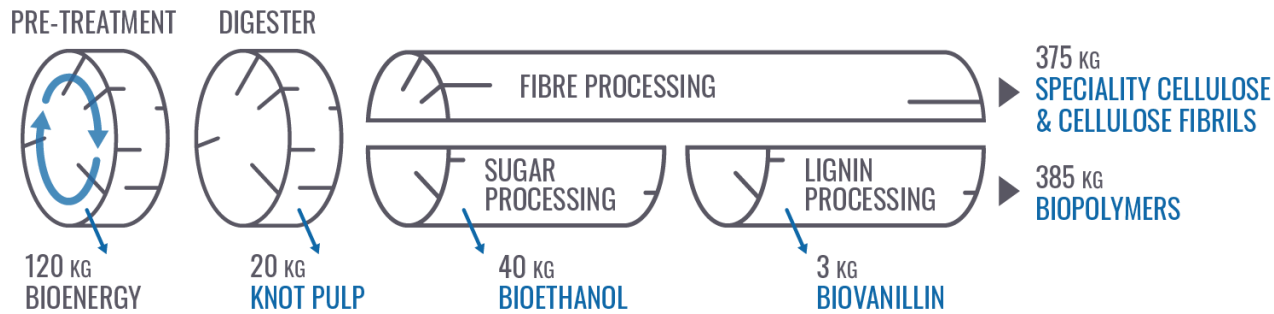
# Operates one of the world's most advanced biorefineries

Integration models:

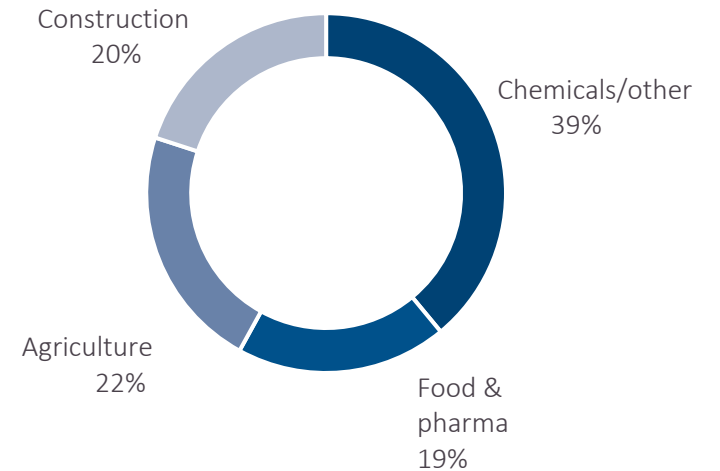
- Own integrated
- Partner integrated
- Independent

Integrated production system serving diverse markets

1000 KG  
WOOD  
▼  
94%  
UTILISATION



End markets 2023



## SPECIALITY CELLULOSE

- Construction
- Filters
- Inks and coatings
- Casings
- Food/pharma/personal care
- Textiles

## CELLULOSE FIBRILS

- Adhesives
- Coatings
- Agriculture
- Personal care
- Home care
- Construction

## BIOPOLYMERS

- Construction
- Animal feed pellets
- Batteries
- Briquetting
- Crop protection
- Plant nutrition

## BIOVANILLIN

- Food and beverages
- Fragrances
- Personal care and cosmetics
- Pharmaceuticals
- Agrochemicals

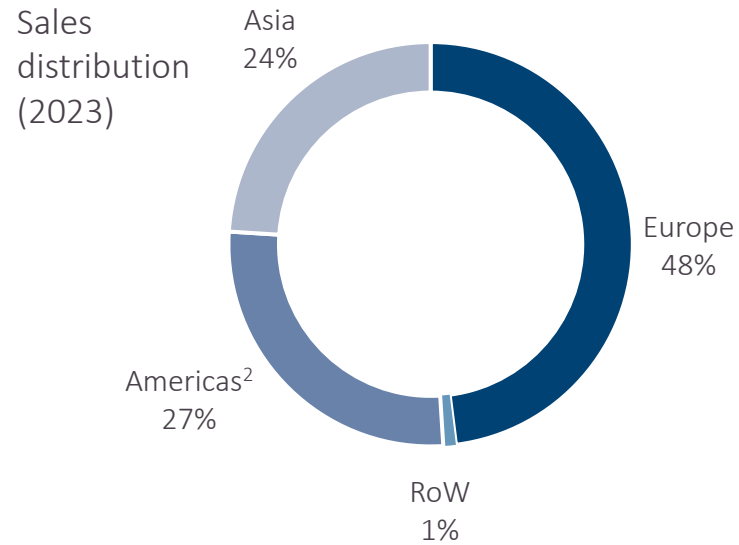
## BIOETHANOL

- Biofuel
- Disinfectants
- Pharmaceutical industry
- Home and personal care products
- Paints and coatings
- Car care

# Global niche player with a market driven organisation



BioSolutions (55% <sup>1</sup> )	BioMaterials (34% <sup>1</sup> )	Fine Chemicals (11% <sup>1</sup> )
Largest supplier, technology leader in lignin-based biopolymers with global markets, only producer of wood-based vanillin	Leading global speciality cellulose supplier, pioneer in cellulose fibrils	Leading producer of fine chemical intermediates for contrast agents, significant producer of 2 <sup>nd</sup> generation bioethanol



## Market driven organisation

- ~111 FTEs strong sales/technical service organisation
- Dedicated sales force for each business unit
- ~90% of sales handled through own organisation

<sup>1</sup> Segment revenue as a % of sales revenue 2023

<sup>2</sup> USA/Canada 21%, rest of Americas 6%

# The specialisation strategy

## The Borregaard specialisation strategy



### Specialisation in global niches

- Markets with high barriers to entry
- Leading market positions through application knowledge and proximity to markets
- Diversified market strategy and global market positions secure maximum flexibility



### Strong innovation efforts and continuous improvement

- Business driven innovation model that involves the entire organisation
- Continuous productivity improvement through more efficient organisation, competence development and smart use of technology



### Competence as the main competitive advantage

- Competence differentiates Borregaard from the competitors
- Combination of competences in sales & marketing, R&D and production
- Leverage expert knowledge to grow organically and through acquisitions

*Culture – market-oriented, innovative and change-oriented*

*Sustainability – key decision criterion to innovation and new initiatives*



*The Borregaard Way – sustainability, long term perspective and integrity*

# Key strategic considerations



## Increasing momentum for bio-based products

Consumer and investor attention drives demand for greener solutions

- EU Green Deal and Taxonomy
- Science Based Targets initiative's Business Ambition for 1.5°C campaign
- Environmental investments strengthen competitive edge

## Specialisation and value growth will take priority

Significant potential for upgrade of product portfolios in *BioSolutions* and *Speciality Cellulose*

*Cellulose fibrils* represent a captive use of speciality cellulose with high value added

Explore expansion and debottlenecking opportunities at *Sarpsborg biorefinery*

*Further development of the Sarpsborg biorefinery is a low-risk investment and raises barriers to entry*

Considerable potential for further specialisation and value growth

- Portfolio of 800 products with multiple applications in many markets
- The Borregaard specialisation journey is a continuous process towards full specialisation

Unique combination of high-value raw material base, biorefinery assets and expert knowledge



# Strategic priorities

## Increased specialisation and value growth

- Specialisation through innovation and market development
- Leverage high-value lignin raw material base in biopolymers and biovanillin
- Enhance product mix in speciality cellulose
- Development of the cellulose fibrils business
- Targeted investments to support increased specialisation, capacity needs and new initiatives

## Sustainability as a value driver

- Exploit full market potential of biochemicals product portfolio
- Delivery of environmental targets strengthens competitive edge
- Sustainability a key decision criterion in relation to innovation and new initiatives



# Borregaard actively seeking to invest in bio-based start-ups

## Selection criteria

- Conversion of biobased raw materials to chemicals/materials
- Strong ESG/sustainability profile
- Specialisation potential
- Synergies with Borregaard's existing business/competence
- Significant revenue potential (10-100 mEUR)
- Time to market < 5 years



# Investments in bio-based start-ups

## About the company

## Borregaard's engagement in the company



Harvesting and biorefining of macroalgae to ingredients for pharmaceutical and nutraceutical applications (*Norway*)

- 35% ownership fully diluted
- Total investment ≈268 mNOK



Biorefining of spent coffee grounds to ingredients within personal care, human nutrition and agriculture (*Denmark*)

- 12% ownership fully diluted with 3 mEUR investment
- Option to increase ownership to 34% by January 2026 with additional 9.25 mEUR investment



Processing of technical lignins from biorefineries for use in personal care as well as industrial applications (*Austria*)

- 12% ownership
- Total investment 1 mEUR



Biorefining of farmed macroalgae to ingredients within food, health & wellness, skincare and materials (*Scotland*)

- 1% ownership
- Total investment 0.15 mUSD



# Sustainability – integral part of market offering

## RAW MATERIALS



*Natural, renewable, sustainable raw materials*

### Sustainable and certified wood

- Documentation
- PEFC<sup>1)</sup> and FSC<sup>1)</sup> standards
- Lignin raw materials from certified or controlled forests
- Non-GMO raw material

## PROCESSES



*Efficient and sustainable production and value chain*

### Reduced emissions improve LCA<sup>2)</sup>

- Target based CO<sub>2</sub> reductions
  - Energy conservations
  - New/green energy sources
- Reduced emissions to water and air
- “Greener” logistical solutions

## PRODUCTS



*Sustainable biochemicals*

### Products add sustainability value to customers

- Climate: LCA<sup>2)</sup> shows favourable GHG footprint
- Biobased: Natural raw materials preferred
- EHS<sup>3)</sup>: Non-toxic, harmless products

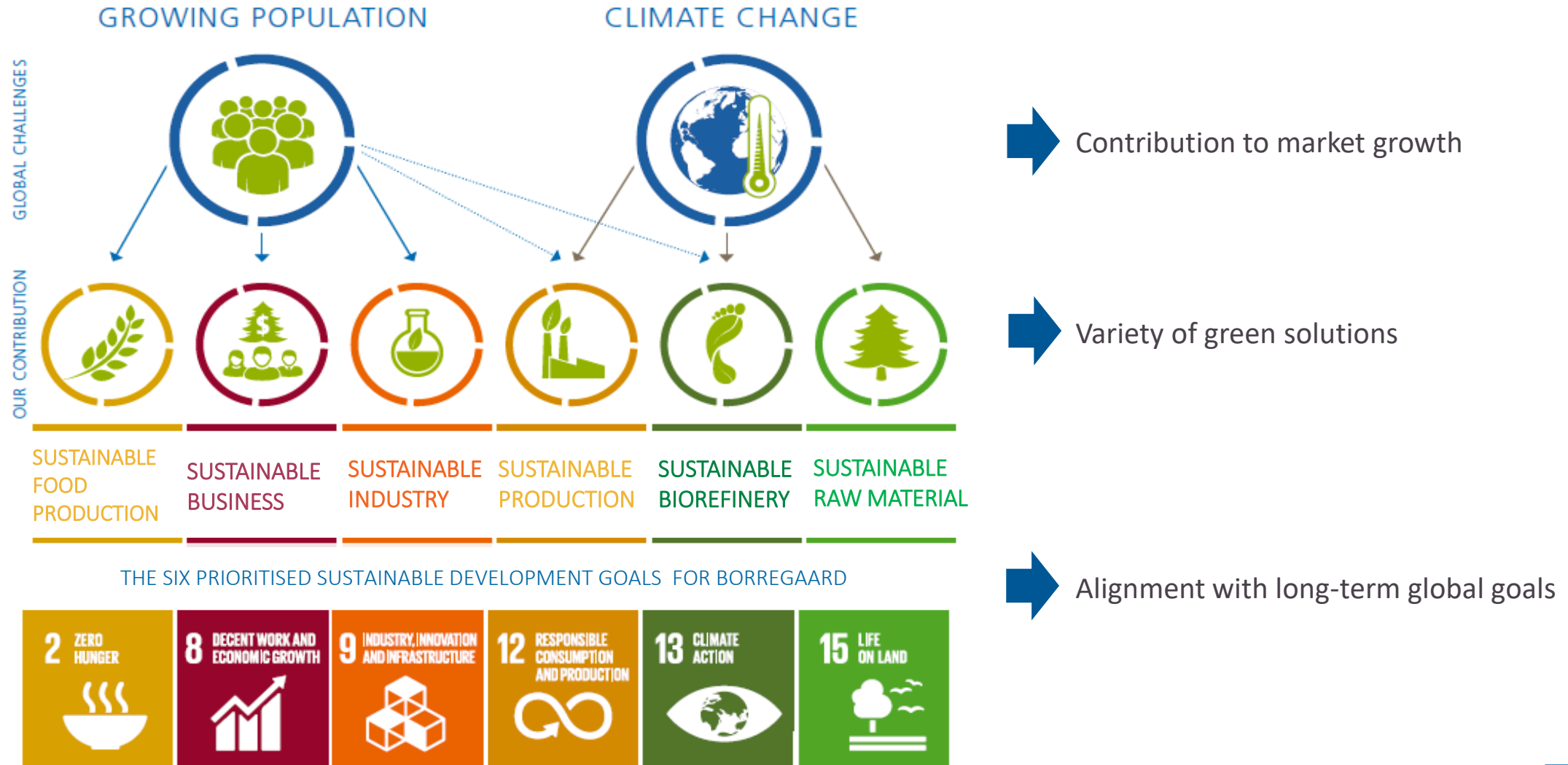
<sup>1)</sup> PEFC: Programme for the Endorsement of Forest Certification, FSC: Forest Stewardship Council

<sup>2)</sup> Life Cycle Analysis

<sup>3)</sup> Environment, Health and Safety



# Alignment with UN's Sustainable Development Goals



# Climate change and the environment – targets and ratings



## Science Based Targets for GHG emissions approved by SBTi

- Targeted reductions in GHG emissions (scope 1 and 2):
  - *42% absolute reduction by 2030 (base year = 2020)*
  - *Net-zero target, 90% absolute reduction by 2050*
- Targets in line with 1.5°C goal in Paris Agreement and Norwegian Climate Law

## Highlighted as a global leader in corporate climate action by CDP

- Borregaard among top 20 out of 15,000 reporting companies
  - *A score within Climate Change (5 years in a row) and Forests*
  - *A- score within Water security*

## Gold status in EcoVadis Supply Chain

- Top 5% of 100,000+ reporting companies



As a **double A List** company, we are leaders in corporate transparency and action on climate change and deforestation.



# Research & development

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- ~15% of Borregaard's revenues come from new products<sup>1)</sup>
- Innovation Management Teams
- ~100 employees in R&D – of which 73 at the research centre in Sarpsborg – 28 have a PhD
- R&D and innovation spending 3.0% of revenues in 2023<sup>2)</sup>
- IP strategies for each BU and major innovation projects



Cellulose Fibrils: Exilva  
microfibrillar cellulose

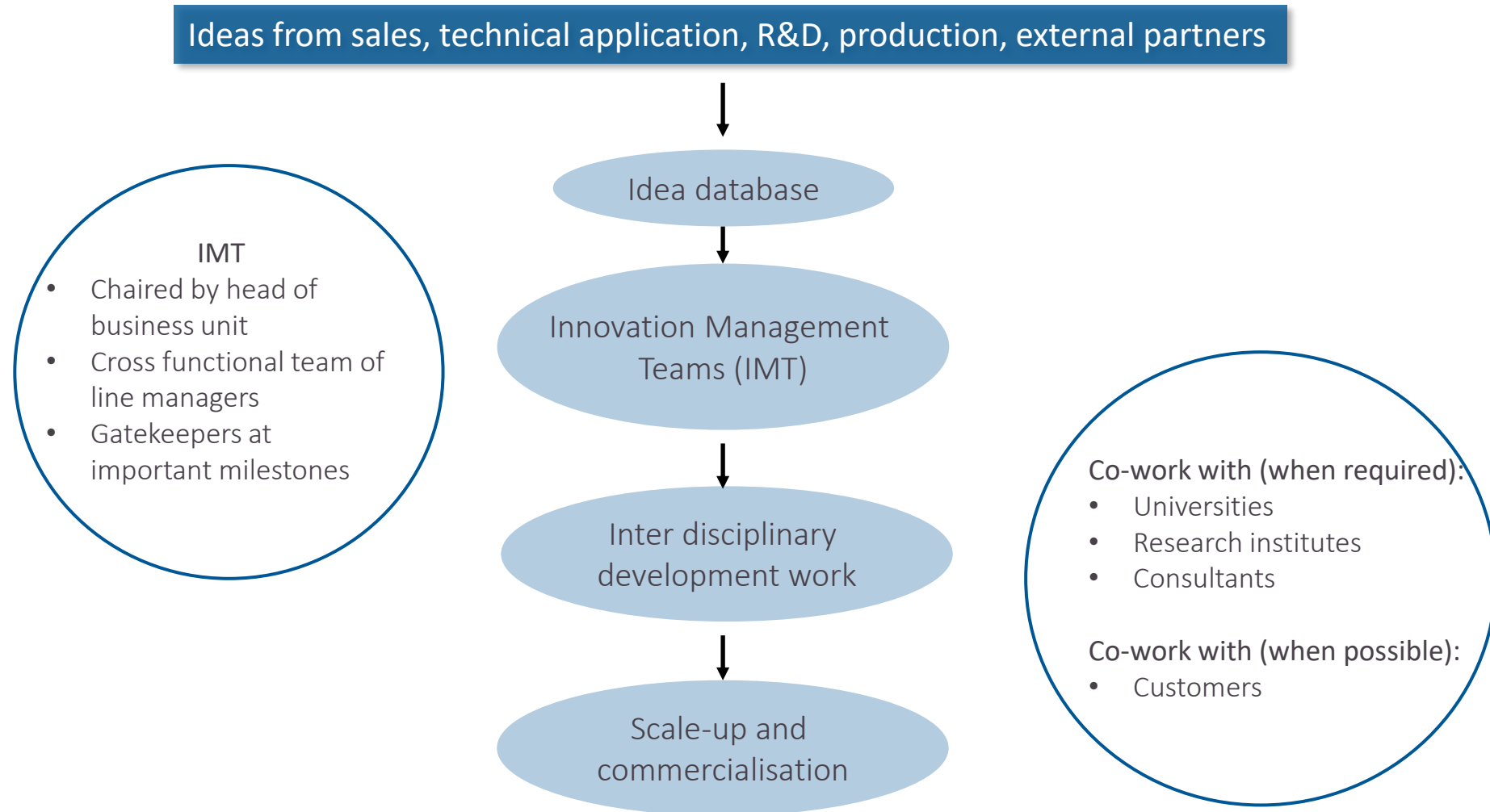


Continuous specialisation  
and improved products

<sup>1)</sup> Sales of new products and applications introduced during the previous five years (2022)

<sup>2)</sup> Includes R&D centres, operation of BALI/Exilva pilots and market/application innovations

# Business driven innovation model





# BioSolutions

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## Market position

- Largest supplier of lignin
- Only supplier of wood based vanillin
- Unique technical and application expertise

## Production

- Norway, USA, Germany, Czech Republic, UK

## Applications

- Concrete admixtures
- Gypsum board
- Ceramics
- Animal feed
- Crop protection
- Plant nutrition
- Oilfield chemicals
- Batteries
- Flavours & fragrances
- Personal care and pharmaceuticals

## Key attractions

- A sustainable and broad product portfolio
- Large and diverse customer base
- High barriers to entry



# Biopolymers: Lignin – a sustainable and flexible raw material

Product performance depends on the pulping process and the raw material

## Sulphite pulping process

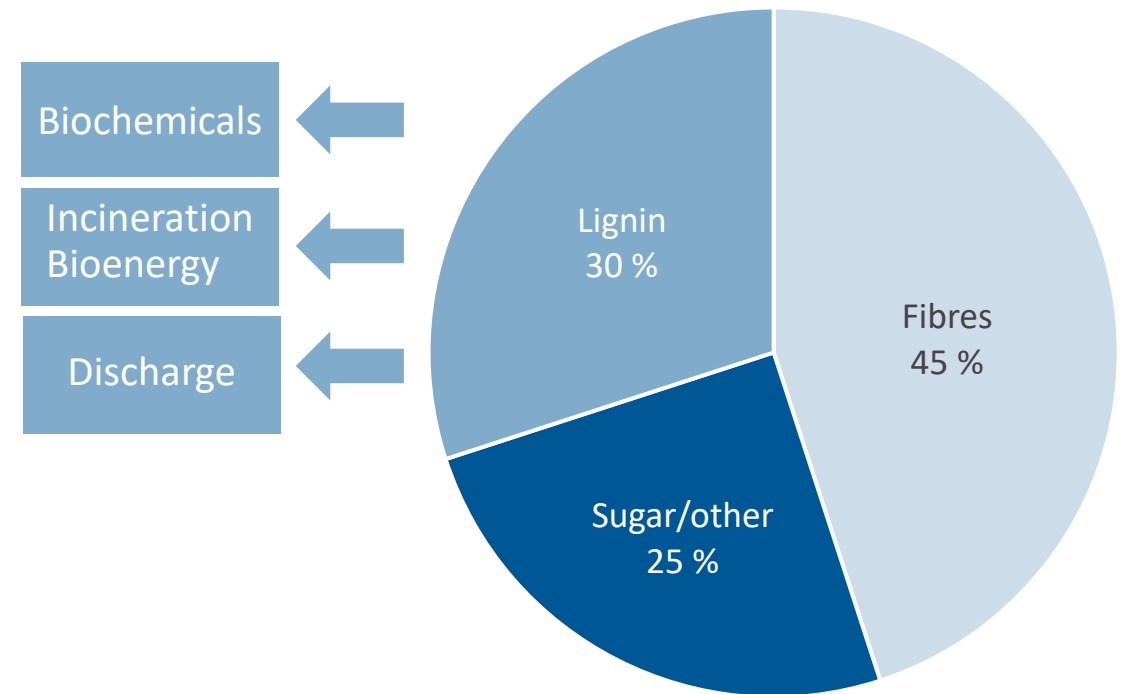
- Versatile lignin used in a variety of products/applications
- Quality depends on the chemicals base
- Water soluble
- Limited number of sulphite mills

## Softwood (pine/spruce) vs hardwood and straw

- Softwood lignin has superior modification potential

## Kraft (sulfate) pulping process

- Lignin is normally incinerated to recover energy and chemicals
- Not in water soluble form from the pulp mill
- Pulp producers are exploring potential for industrial use of kraft lignin

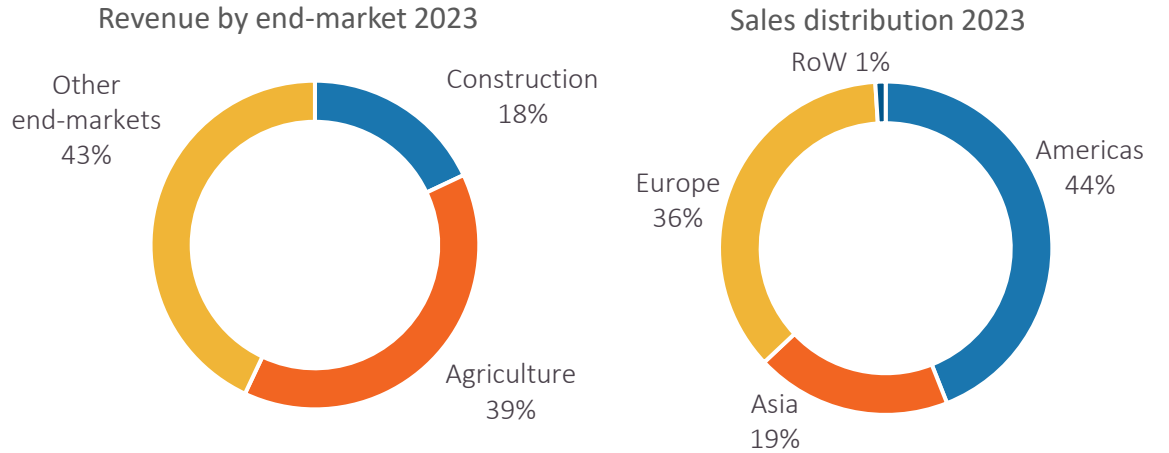


# Diversification: 600 products to 2,700 customers

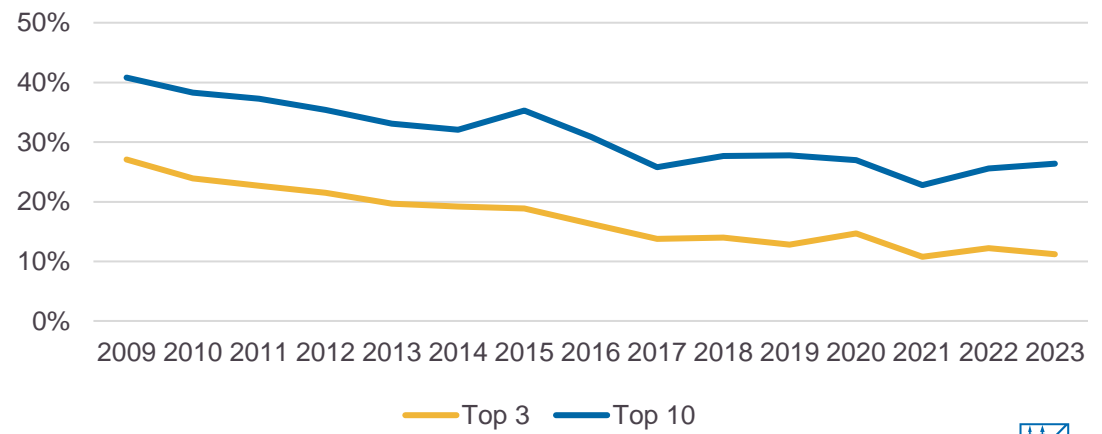
## BioSolutions properties and applications

Binding agent	<ul style="list-style-type: none"> <li>• Ceramics</li> <li>• Dust solutions</li> <li>• Feed</li> <li>• Granulated limestone</li> </ul>
Dispersing agent/ rheology control	<ul style="list-style-type: none"> <li>• Carbon black and pigments</li> <li>• Concrete admixtures</li> <li>• Dyestuffs</li> <li>• Metals and minerals</li> <li>• Micronutrients</li> <li>• Pesticides and biological pest control</li> </ul>
Crystal growth control	<ul style="list-style-type: none"> <li>• Batteries</li> <li>• Oilfield chemicals</li> <li>• Water treatment</li> </ul>
Flavours and fragrances	<ul style="list-style-type: none"> <li>• Food</li> <li>• Fragrances</li> <li>• Personal care</li> </ul>
Chemical building blocks	<ul style="list-style-type: none"> <li>• Agrochemicals</li> <li>• Pharmaceuticals</li> <li>• Resins</li> </ul>
Additional properties	<ul style="list-style-type: none"> <li>• Antioxidant</li> <li>• Anti-microbial</li> <li>• Biostimulant</li> <li>• Complexing agent</li> <li>• Corrosion inhibitor</li> <li>• Emulsion stabiliser</li> <li>• Soil conditioner</li> <li>• UV protection</li> </ul>

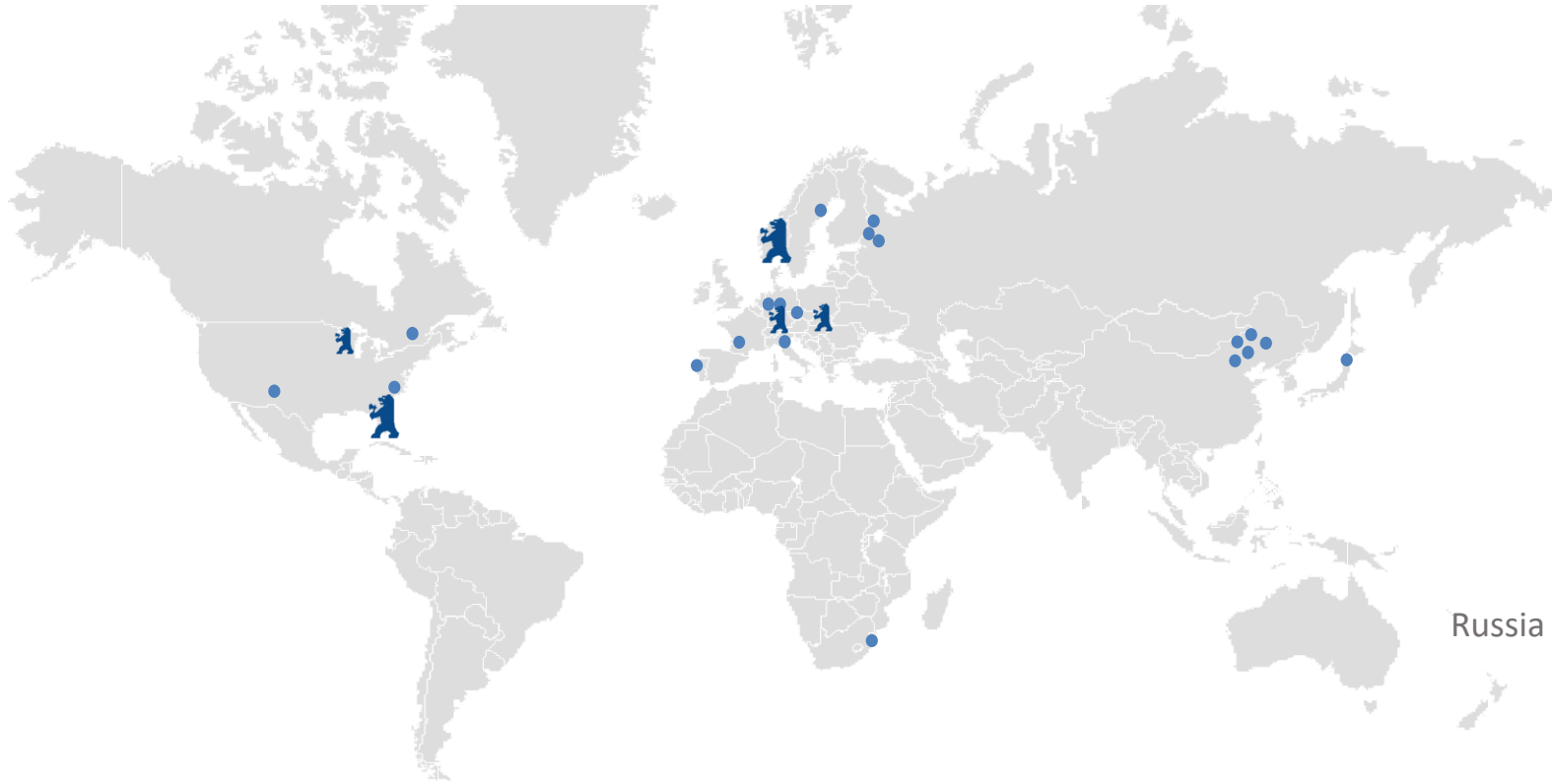
## Revenues by end-market and region



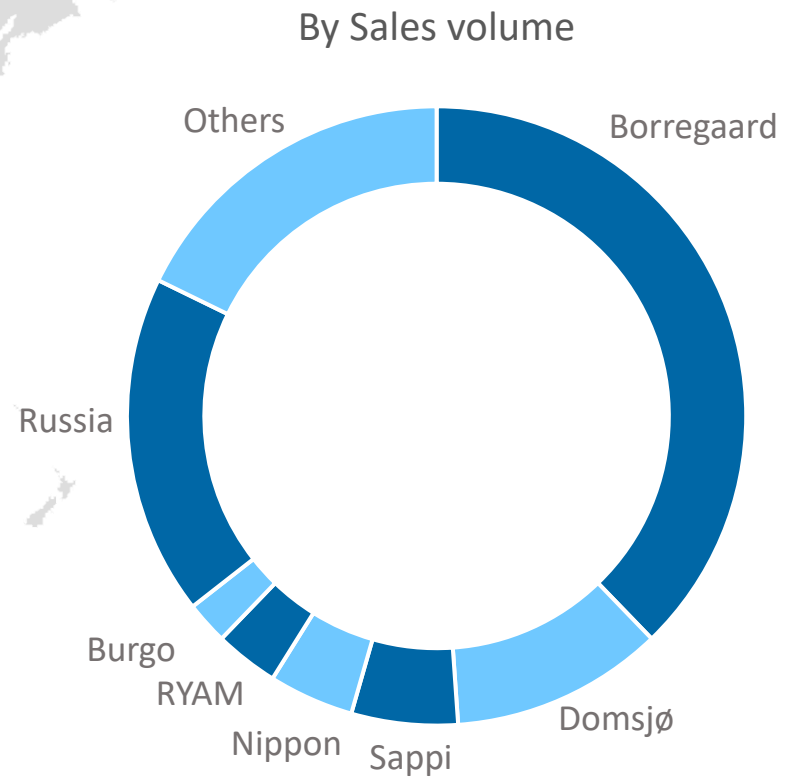
## Top 10 and top 3 customers in % of revenues



# Current global lignin supply

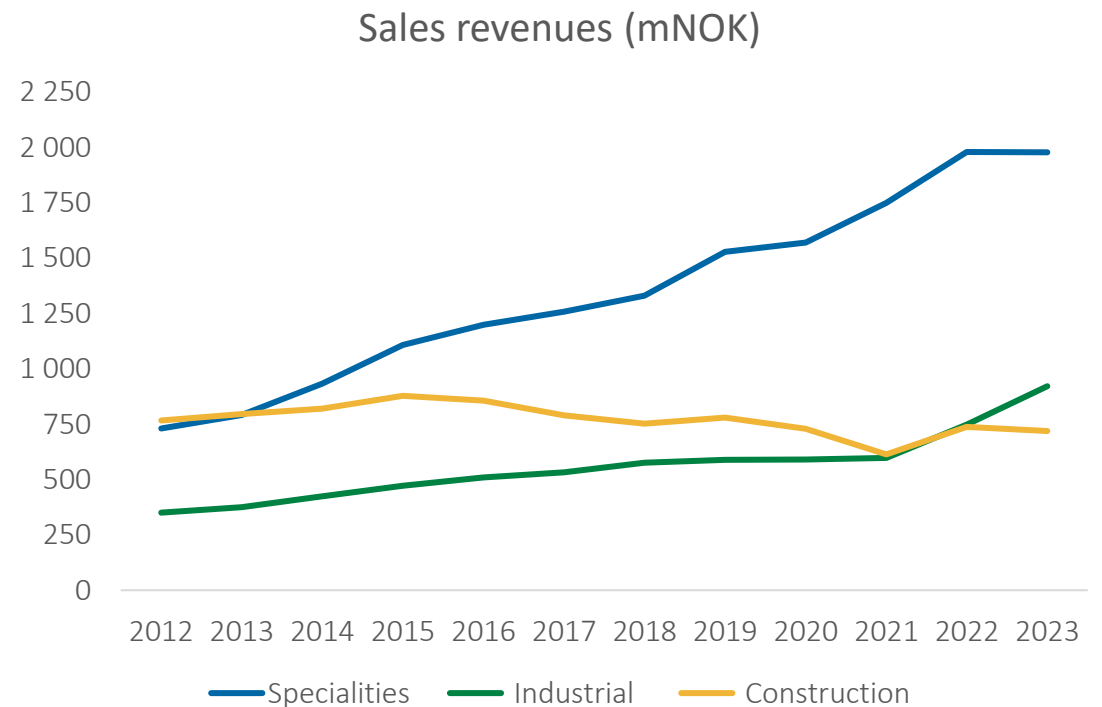
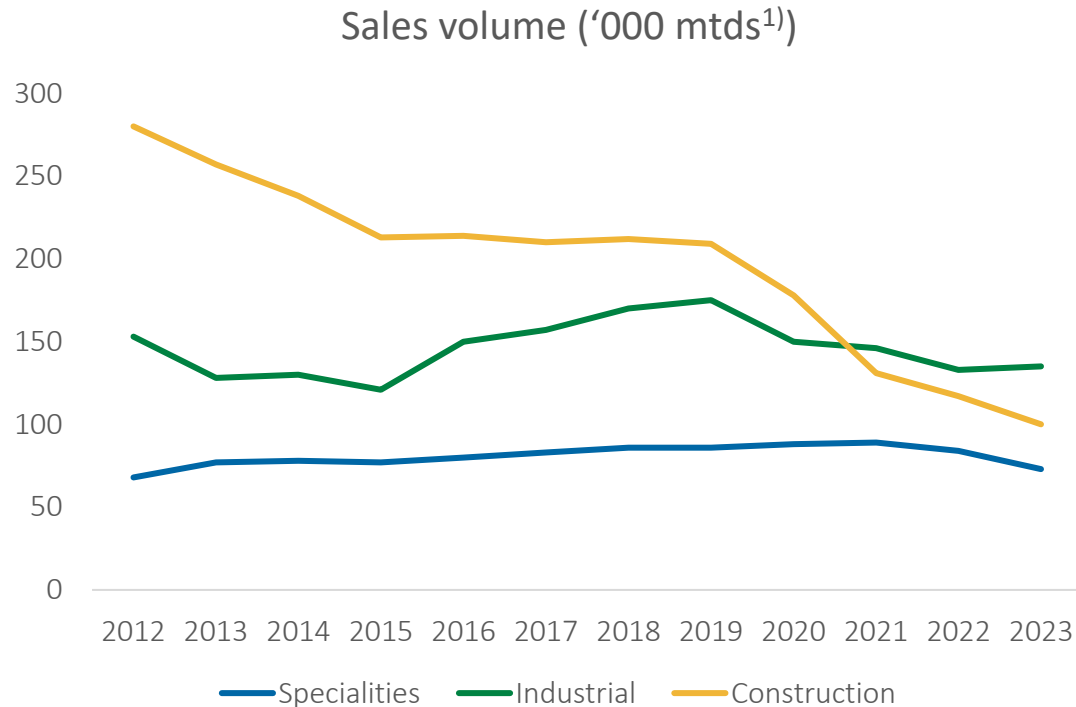


Global lignin supply  
~900-950 kmtds



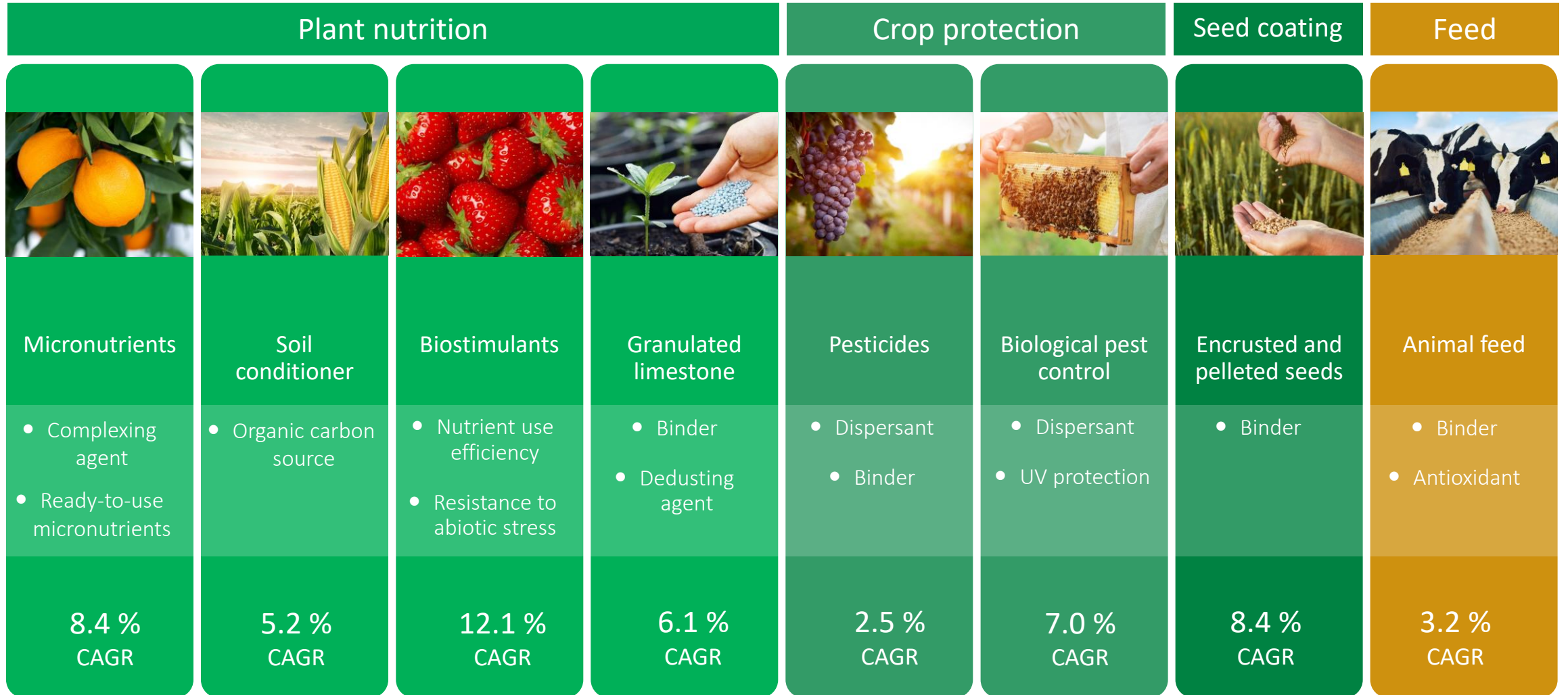


# Significant specialisation and value growth over time



- Gross sales doubled in Industrial and nearly trebled in Specialities from 2012
- Reduced exposure to low-value applications, less cyclicity
- New supply situation in 2020 – focus on value and portfolio optimisation

# Biopolymers in agriculture



# Lignin in lead batteries



Conventional vehicle

Micro-hybrid

Hybrid

Electric vehicle



Flooded battery as start battery

Absorbent Glass Mat (AGM) and Enhanced Flooded Battery (EFB) as start/stop battery

AGM and EFB as start/stop battery

Flooded battery for hotel function<sup>1)</sup>

Fuel for motion

Fuel for motion

Fuel/NiMH/lithium ion for motion

Lithium ion for motion

Automotive:



Other:

<sup>1)</sup> Heating, ventilation, air conditioning, lighting, radio, gauges, etc.

# Innovation strategy

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## Priorities

- Specialisation and value growth
- High-value and advanced applications
- Unique and tailor-made solutions
- Increase value of Florida product portfolio

## Competitive edge

- Unique competence base
- Softwood raw material base and advanced technology
- Well documented sustainability profile
- Strong innovation portfolio





# Sustainability – a competitive edge offering new opportunities

Supplier of green alternatives to fossil-based products

World leader in sustainable lignin-based biopolymers and biovanillin

Well-documented competitive edge in sustainability

- Life Cycle Assessments (LCA) and Environmental Product Declarations (EPD)
- GHG footprint benchmarks vs fossil-based alternatives
- Wood from certified forests

2 ZERO HUNGER



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



15 LIFE ON LAND



# Agriculture – suspension concentrates

- Suspension concentrates is the largest and fastest growing segment in liquid crop protection products
- Lignin-based biopolymers traditionally used in granulated products
- Customers' perception of the biopolymer colour prevented use in aqueous formulations despite performance similar to advanced fossil-based dispersants
- Borregaard biopolymer dispersant has 70% lower CO<sub>2</sub> footprint compared with fossil-based alternative

## *Sustainability offering new opportunities*

Borregaard's favorable climate footprint enabled new high-value business



# Agriculture – suspension concentrates and water dispersible granules

- Novel product range for crop protection
- High performance binders and dispersants for liquid and granulated formulations based on proprietary technology
- Superior performance in formulations with high electrolyte (salt) content
- Improved compatibility with fertilisers in liquid solutions
- Established business with strong pipeline

*Sustainability offering new opportunities*  
Green alternatives to fossil-based products





# Vegetable leather tanning

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Chrome used in leather tanning since 1800's

- Poor environmental profile

Leather tanning industry gradually changing to a greener technology

- Returning to vegetable tanning

*Sustainability offering new opportunities*

Borregaard biopolymers part of the sustainable solution





# Textile industry - Pigments and inks

## Challenging sustainability profile

- Fossil-based dispersants widely used

## Industry changing to new and environmentally friendly technologies and dispersants

- Focus on water reduction and green additives
- Growing trend towards digital textile printing

### *Sustainability offering new opportunities*

Borregaard high-quality dyestuff dispersants, a greener solution for the textile industry



# Lead batteries – energy storage systems

Batteries play a crucial role in decarbonisation

- Electrification of the transportation sector
- Energy storage systems (ESS) for renewable energy
  - *+200%<sup>1)</sup> growth in period 2020-2030*

ESS – a growth opportunity for lead batteries

- Need for alternative technologies to Li-ion
- Lead batteries well suited for ESS
  - *High degree of safety, low cost, high recycling rate (99%)*
- Significant industry efforts to meet ESS requirements for energy density and life

*Sustainability offering new opportunities*

*Borregaard lignin-based expanders*

*– key enabler for lead batteries in ESS*



# LignoTech Florida



## The venture

- Located at Rayonier Advanced Materials' (RYAM) Fernandina Beach softwood sulphite pulp mill
- Borregaard (55%) and RYAM (45%) ownership
- Borregaard's know-how and technology

## Expansion project in two phases

- Phase one (2018) represents 100,000 mtds capacity, investment USD 110 mill.
- Phase two will give additional 50,000 mtds, investment estimated at USD 25 mill. in 2016







## New plant officially opened 26 June 2018

- Investment completed on time and cost
- Production commenced in June 2018

## Commercialisation

- Phase one ramped up to capacity after three years, according to plan
- Diversified product and application portfolio established

# Borregaard – the only producer of wood-based vanillin

	Vanilla beans	Plant based vanillin				Oil based vanillin & ethyl vanillin	
							
Raw material	Beans	Ferulic acid from bran/straw	Eugenol from clove	Lignin from wood	Guaiacol from creosote/tar	Guaiacol (vanillin)	Guethol (ethyl vanillin)
Key selling points	Natural/ flavour profile	Plant based/natural raw material/sustainability /flavour profile				Price	
Sales volume 2023 (mt) <sup>1)</sup>	≈2 400 <sup>2)</sup>	≈1 800				≈17 000	≈6 000
Indicative price level USD/kg <sup>1)</sup>	≈50 - 60	≈200	30 - 70			10 – 15 <sup>3)</sup>	
# of manufacturers <sup>1)</sup>	1 000+	4	5	1	3	3	4
Growth <sup>1)</sup>	≈5%					≈2-3%	

<sup>1)</sup> Company estimates

<sup>2)</sup> Cured vanilla pods contain around 1-2% vanillin, corresponding to around 25 – 50 mt on pure vanillin basis

<sup>3)</sup> Towards the end of 2023, the prices of synthetic and ethyl vanillin dropped below 10 USD/kg due to increased Chinese production



# Biovanillin – well positioned for growth

## Strong demand growth for bio-based vanillin

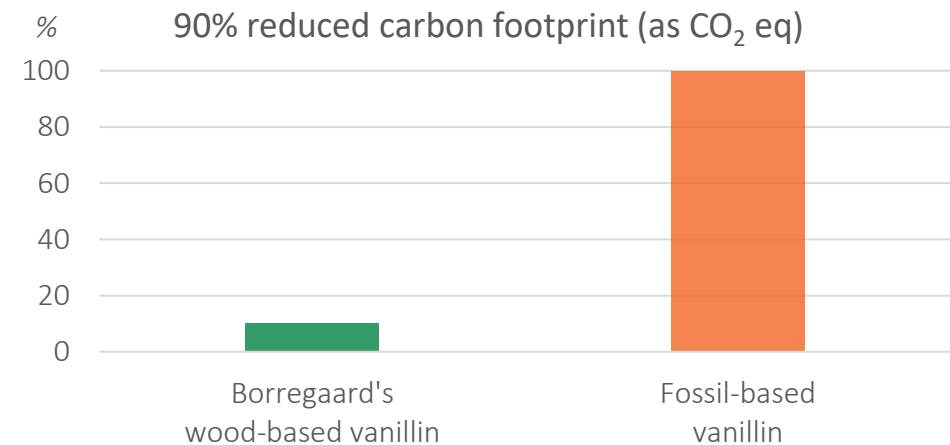
- Consumer preferences
- Sustainability

## Competitive edge

- Global market leader in bio-based vanillin
- Advanced and attractive flavour profile
- >90% reduced carbon footprint vs fossil-based vanillin
- Certified spruce wood, sustainable forestry
- Cost competitive technology

## Outlook

- Capacity expansion well above the +20% target
- Continued gradual introduction
- Significant expansion of fossil-based capacity



# Speciality cellulose

## Market position

- Strong positions in Europe and Asia within high-end niches

## Production

- Sarpsborg, Norway with capacity of 160,000 metric tonne

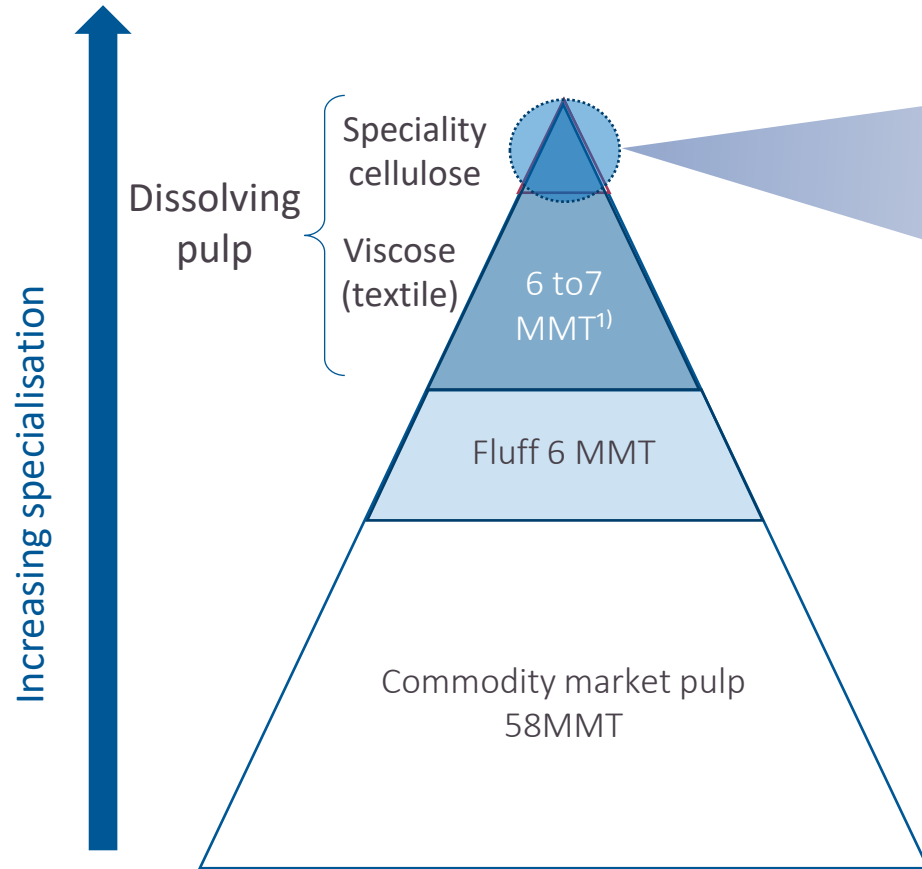
Focused applications	Market growth <sup>1)</sup>
• Ethers	3-4%
• Acetate	0-2%
• Nitrocellulose	0%
• Casings	3-4%



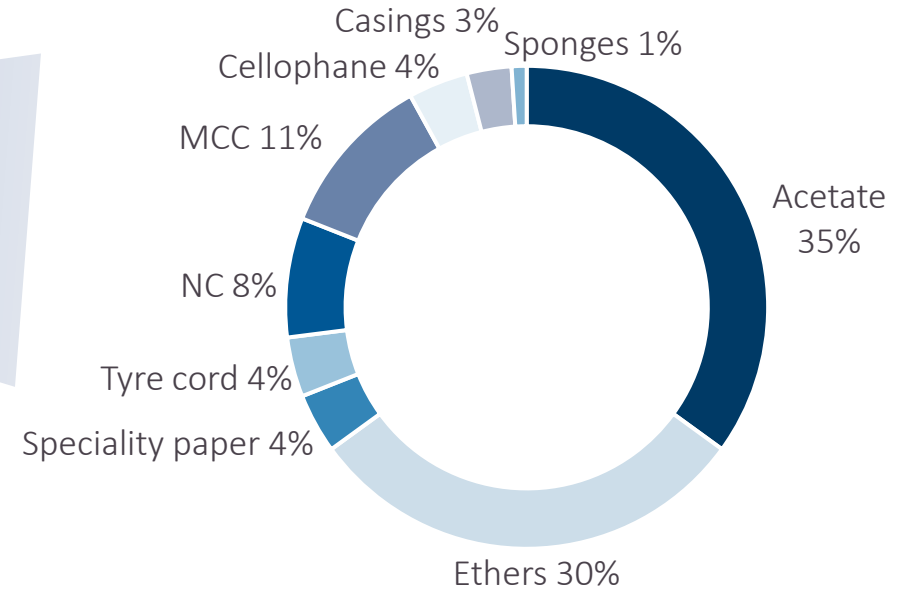
High quality speciality cellulose with strong niche positions

# The speciality cellulose market

Total global cellulose market



Speciality cellulose market ~1.6 MMT



## Recent trends

- Total speciality cellulose market relatively unchanged
- Viscose (textile) market growth of around 8% annually during the last 5 years has been temporarily reduced due to the coronavirus pandemic and signs of a potential recession
- Industry restructuring

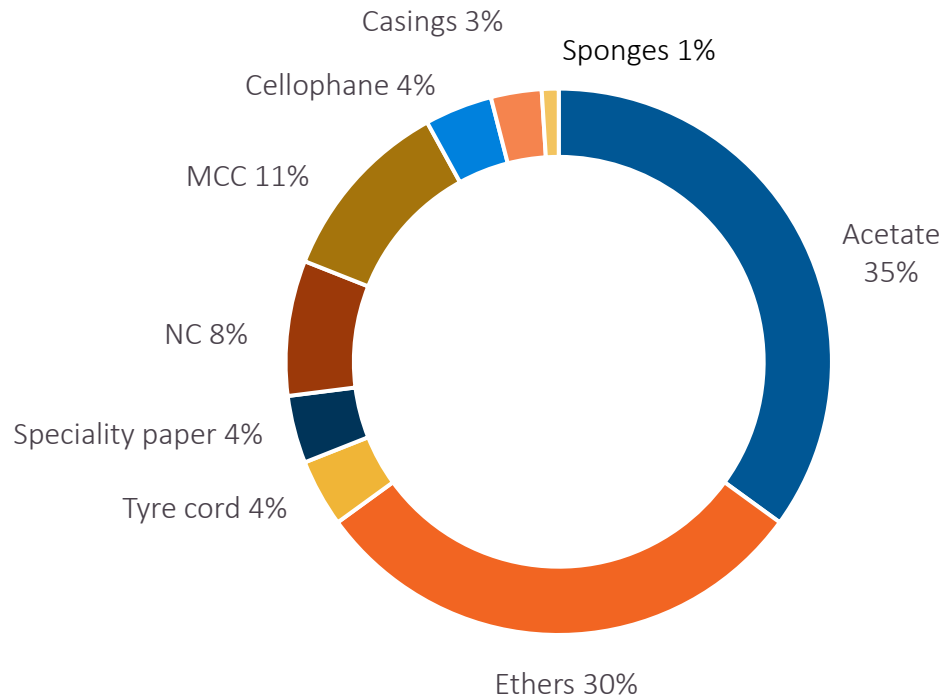
<sup>1)</sup> Million metric tonnes

Source: Borregaard estimates, Celco market reports, RISI 2022

All figures in cellulose tonnes – wood pulp and cotton linter pulp/refined cotton. Dissolving pulp figures do not include fluff and (modified) paper pulp

# Speciality cellulose market

Speciality cellulose demand (1.6 million mt<sup>1)</sup>)



	Segments	Applications	Market size '000 mt (2023)	Annual growth 2023-2024
Highly specialised	Acetate	Cigarette filters, plastics, LCD, yarn	550	0-2%
	Ethers <sup>2)</sup>	Construction, coatings, food, pharma, personal care	480 <sup>3)</sup>	3-4%
	Speciality paper	Automotive filtration, bank notes	60	1-2%
	Tyre cord	High-performance tyre cords	60	2-3%
	High purity casings and sponges	Sausage casings, sponge cloths	35	0-1%
Other specialities	Nitrocellulose (NC)	Coatings, printing inks, nail varnish, energetic grades	125	0 %
	Microcrystalline cellulose (MCC)	Food, pharma	180	3-4%
	Cellophane	Food packaging	55	0-1%
	Casings	Sausage casings	30	3-4%
	Sponges	Sponge cloths	15	1-2%

Source: Celco market reports, RISI and Borregaard estimates

<sup>1)</sup> Metric tonne

<sup>2)</sup> Cellulose ether capacity excl. technical grade CMC

<sup>3)</sup> In 2023-2024 capacity utilization is reduced by 20-25% due to lower demand in construction applications



# The speciality cellulose industry

The speciality cellulose market is ≈1.6 million tonnes<sup>1)</sup>

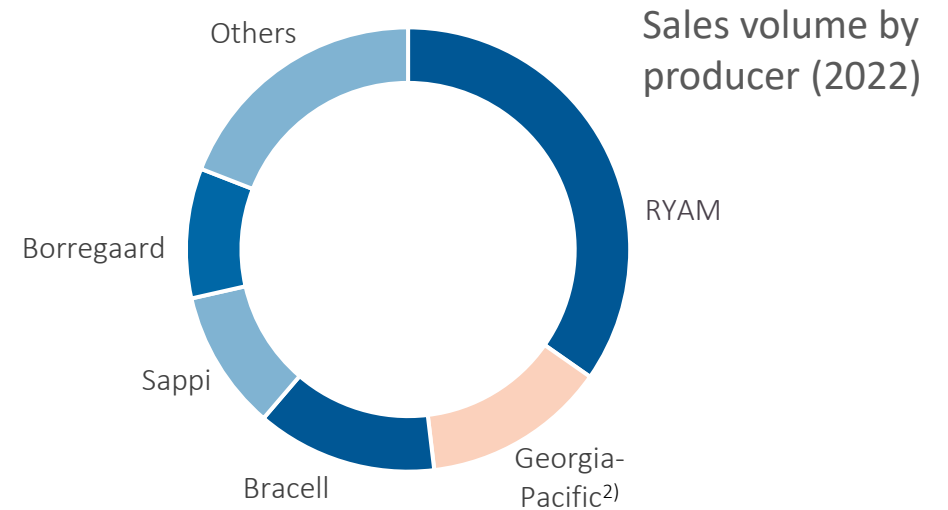
- Top 5 producers have ≈80% market share
- Kraft or sulphite pulping process
- Hardwood and softwood raw material
- Some cotton linter pulp (CLP) producers

Limited volumes from textile cellulose producers

- High barriers to entry
- Mainly targeting acetate, nitrocellulose and casings

Borregaard production capacity is ≈160,000 tonnes

- Softwood and sulphite process
- Strong market positions in high-end niches in Europe and Asia



Top 5 speciality producers by wood species and pulping process

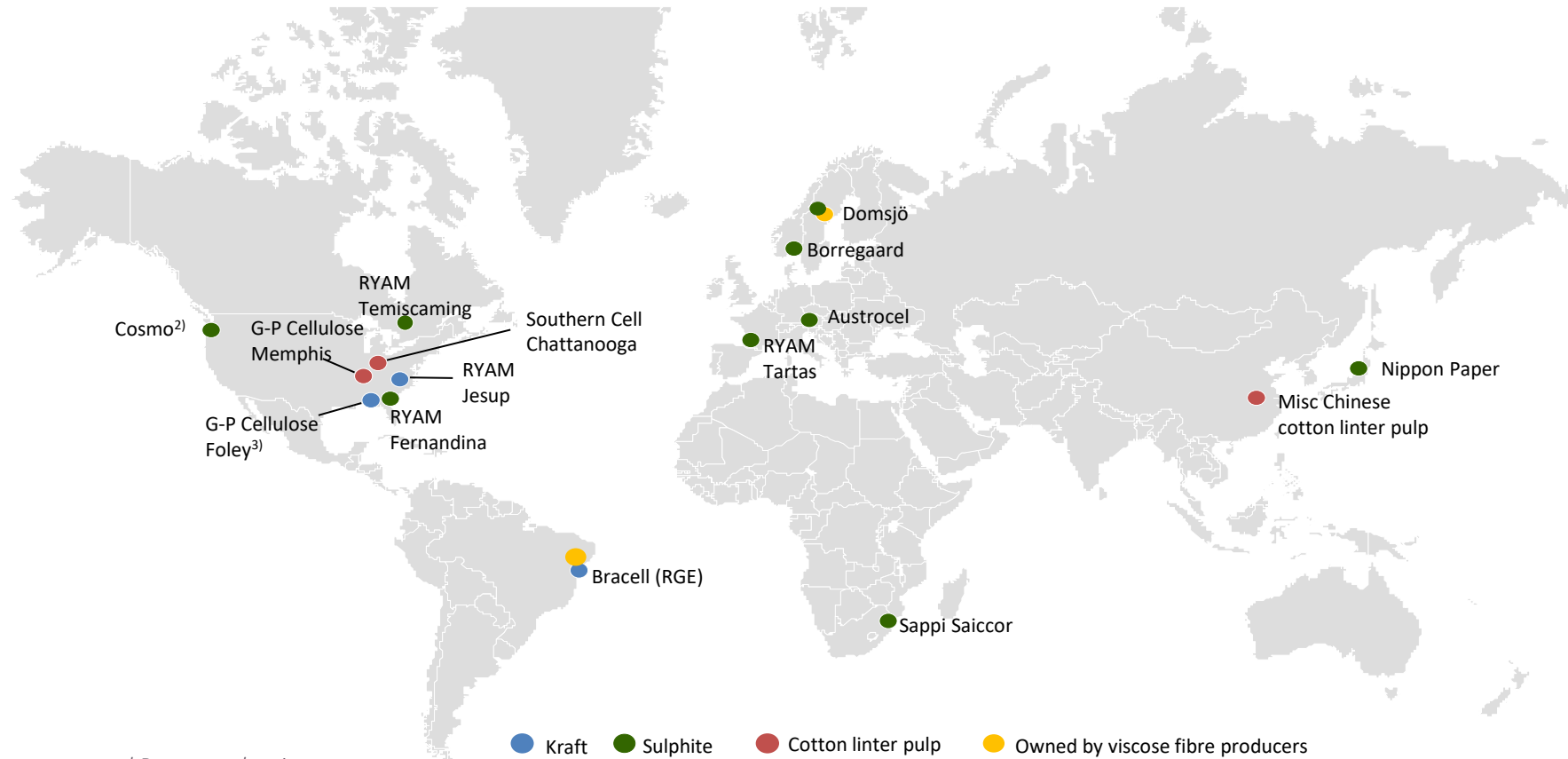
	Hardwood/ kraft	Softwood/ kraft	Hardwood/ sulphite	Softwood/ sulphite
RYAM	✓	✓		✓
Georgia-Pacific <sup>2)</sup>		✓		
Bracell	✓			
Sappi			✓	
Borregaard				✓

<sup>1)</sup> Source: Borregaard estimates, CelCo

<sup>2)</sup> Press release September 18, 2023: Georgia-Pacific announces plan to permanently close the Foley facility

# Speciality cellulose suppliers

- 12 players supplying 1.6 million mt speciality cellulose<sup>1)</sup>
- Top players use textile and fluff markets as capacity filler
- Limited volumes from viscose pulp producers into speciality segments due to barriers to entry



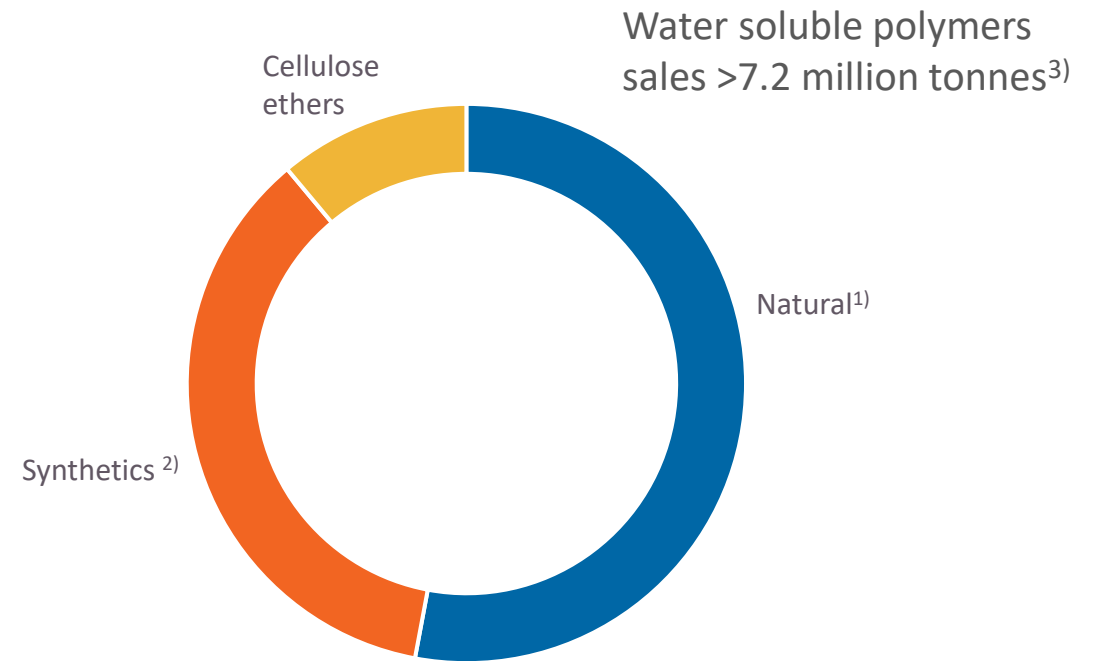
<sup>1)</sup>Source: Celco market reports and Borregaard estimates

<sup>2)</sup>Currently idle, start up date unknown

<sup>3)</sup>Press release September 18, 2023: Georgia-Pacific announces plan to permanently close the facility

# Cellulose ethers – water soluble polymers with high barriers to entry

- The market for water soluble polymers consists of cellulose ethers, natural and synthetic products
- Cellulose ethers have no direct substitutes with comparable multi-functionality
- Mostly used as an additive to modify rheological properties of water-based formulations
- Reformulation and qualification require 1-5 years
- Cellulose ethers differentiated by a price premium based on function and application



<sup>1)</sup> Natural = Products extracted and refined from natural sources

<sup>2)</sup> Synthetic = Products created from petrochemicals

<sup>3)</sup> Source: Borregaard internal data, IMR International (2021)

# Cellulose ethers – solid growth and attractive opportunities

Current demand for cellulose for ethers is 480,000 tonnes

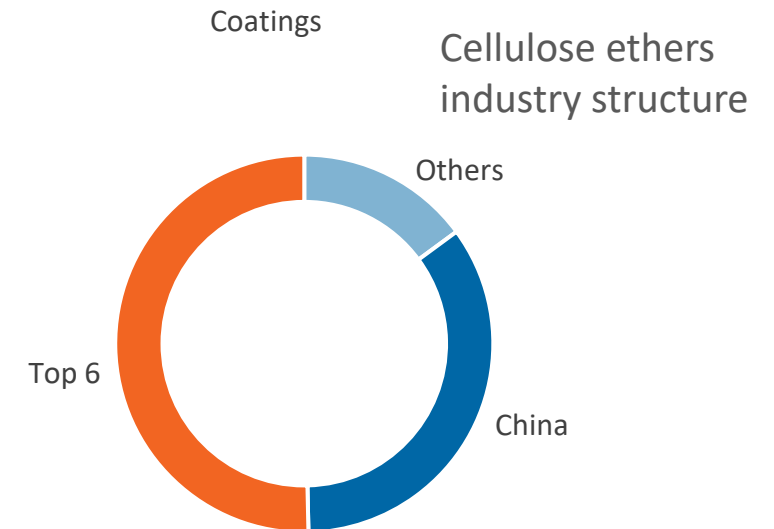
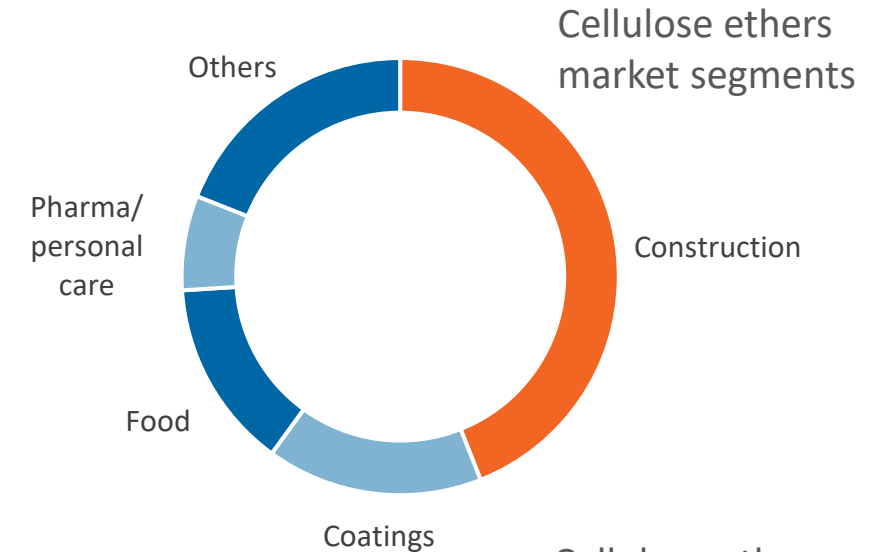
- Projected annual growth 3-4%
- Highest growth in segments requiring high viscosity pulp
- The alternative to wood pulp is cotton linters pulp (CLP) or CLP/fluff pulp blend
- A high degree of differentiation and tailored end products

Requirement for sustainable raw materials increasingly important

- Speciality cellulose from wood has better sustainability profile than CLP
- Increasing demand for sustainability certification and reporting

Top 6 cellulose ether producers represent ≈50 % of global capacity

- Ashland, Dow, IFF, Shin-Etsu, Lotte and Nouryon
- High concentration of producers in Europe and Asia
- New capacity commissioned or under construction in Europe, Asia and USA





# Borregaard well positioned for growth and further specialisation

## Borregaard position

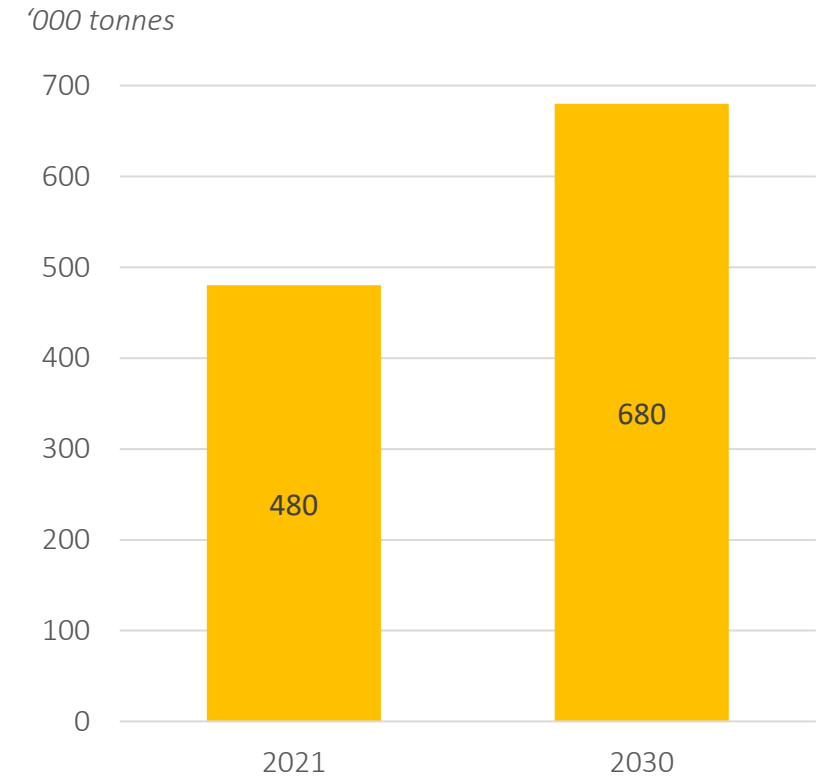
- A major and growing share of Borregaard's cellulose sold to cellulose ethers producers
- Complete portfolio of ether cellulose grades with a high degree of tailor-making
- Most regulated segments require GMO-free raw material which excludes CLP
- Industry leader in sustainability documentation and certification

## Borregaard ambition

- Grow with the cellulose ether market
- Continue to innovate and meet future needs of the cellulose ether industry

## Borregaard will continue to support the cellulose ether industry

- Develop and debottleneck sustainable production processes further
- Phase out non-core speciality cellulose applications
- An increasing share of ether portfolio to regulated applications (food & pharma)



Projected growth for cellulose for ethers

# Ice Bear – continued growth and new applications

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## Strategic initiative for high purity cellulose in all market segments

- Maintain existing market positions in cellulose acetate
- Enable further specialisation in all target segments

## Sustainability trends create opportunities for Ice Bear

- Stricter regulations and issues with fossil-based plastics
- Cellulose acetate plastics are derived from bio-based raw material
- All major cellulose acetate producers focus on non-filter tow end uses
- End products can be tailored for biodegradability
- Joint product development with key customers

## Ramp-up based on market demand and customer qualification

- Increasing sales to new speciality applications
- Further growth projected within several speciality applications



# Cellulose fibrils

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Global leader in micro-/nanofibrils

- Competitors in pilot plant or captive use phase

Large scale plant with 1000 tonnes dry capacity

- Use cellulose as raw material
- Zero emissions

Embryonic but fast-growing market

Product is a network of micro and nano fibrils with large surface area

- 1 gram covers a tennis court

Key benefits

- Improve and control flow
- Create a barrier or a film

More than 30 application areas

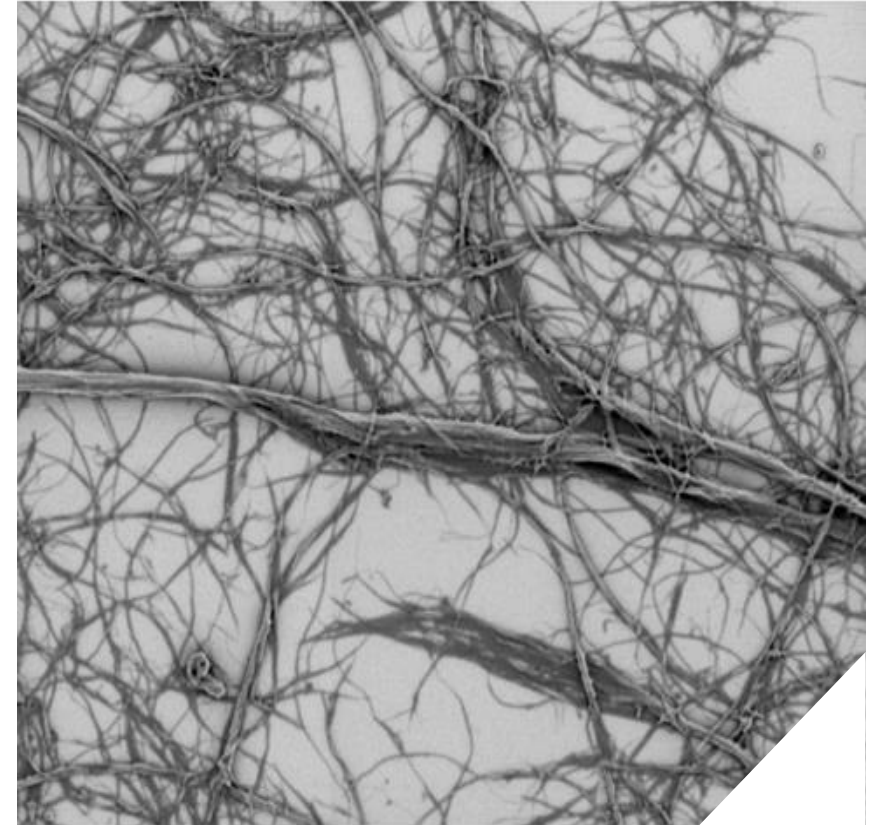
- From pharma to concrete



# Cellulose fibrils – Exilva

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- Microfibrillar cellulose (MFC) is cellulose fibers defibrillated into millions of tiny fibrils (100,000 times thinner than hair)
- Exilva is Borregaard's brand name for microfibrillar cellulose used in industrial applications
- Exilva is a sustainable biobased material with multifunctional properties
  - Improves flow, stability, flexibility and strength in industrial formulations and materials
  - Enables customers to develop new and improved products



# Cellulose fibrils – growing pipeline and customer base

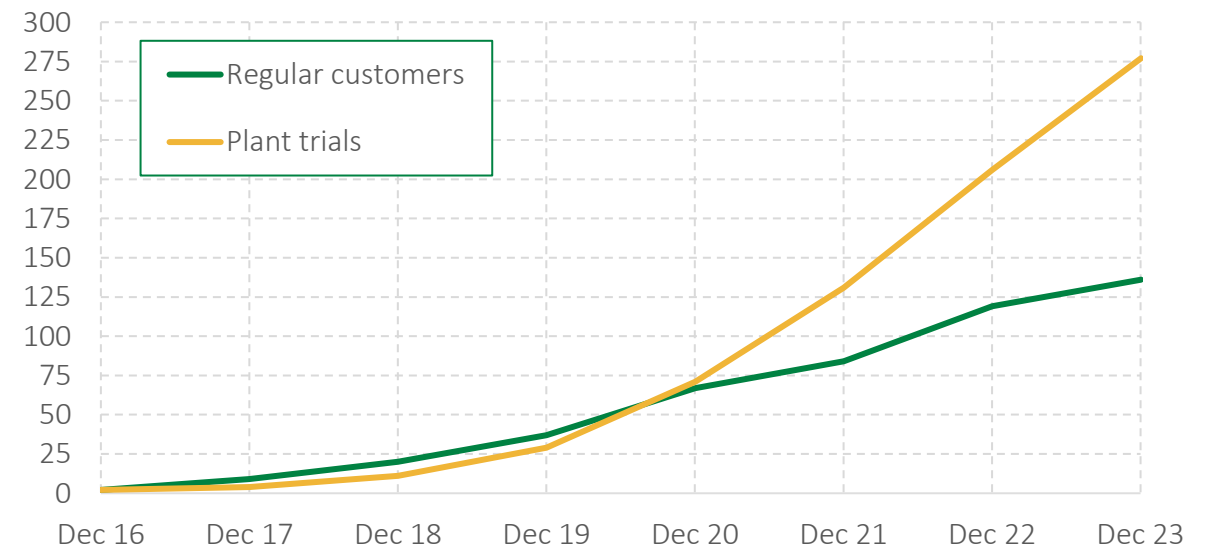
## 136 regular customers

- Good growth and promising development within selected applications
  - *Corrugated board*
  - *Home Care*
  - *Barrier Coating*
  - *Elastomeric*

## 277 potential customers in plant trial phase

- *Stable and good development of plant trials*

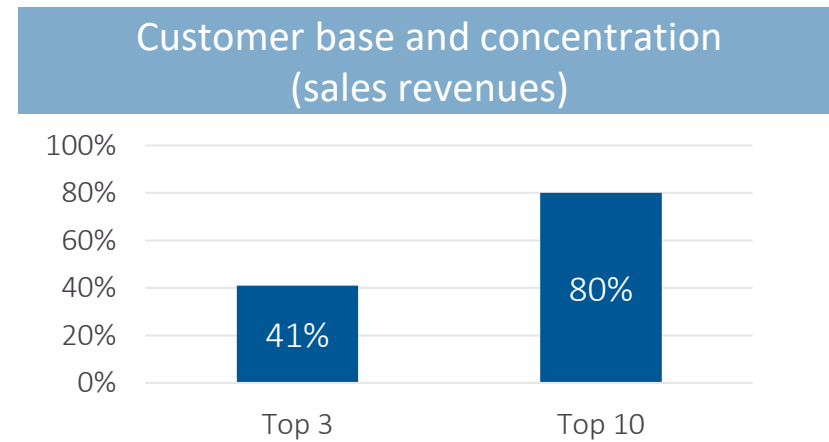
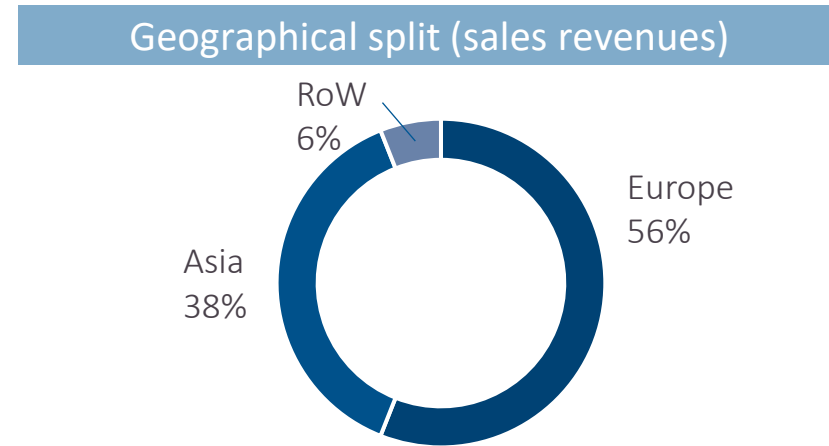
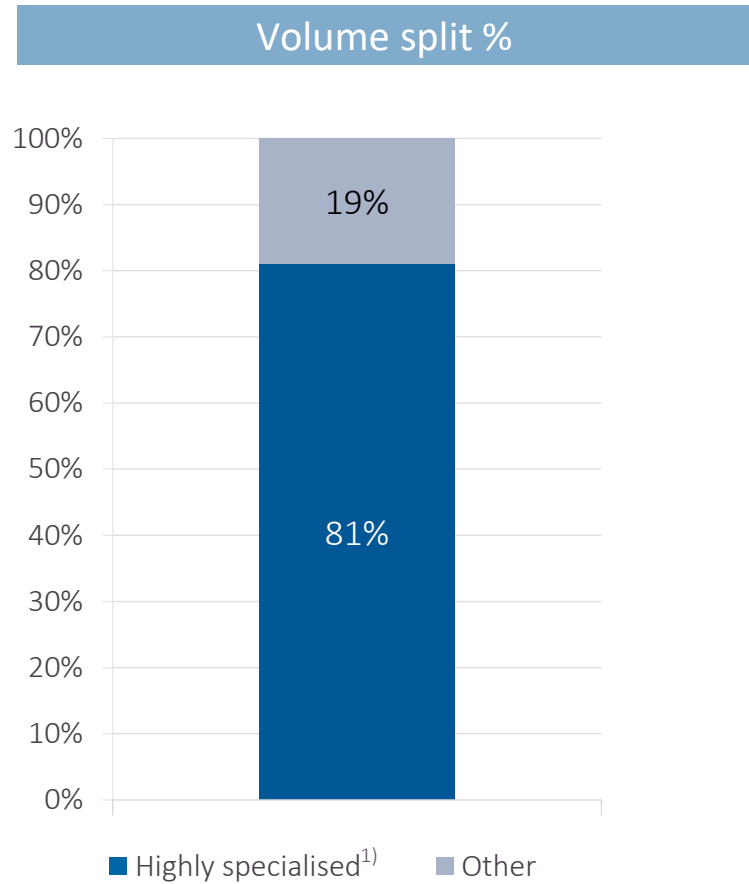
Customers and plant trials





# Sales distribution 2023

Borregaard is positioned in high-end segments in Europe and Asia, with strong and long-lasting customer relationships



Source: Borregaard estimates  
<sup>1)</sup> Acetate, ether and tire cord grades

# Fine Chemicals

## Fine chemical intermediates

### Market position

- Leading producer of intermediates for contrast agents

### Production

- Sarpsborg, Norway

### Products

- C3 aminodiols
- Intermediates for pharmaceutical products

### Applications

- Contrast agents for medical imaging
- Medicines

### Market growth<sup>1)</sup>

- 5-7%



## Bioethanol

### Market position

- Leading producer of second-generation bioethanol

### Production

- Sarpsborg, Norway

### Products

- Pure and denatured bioethanol

### Applications

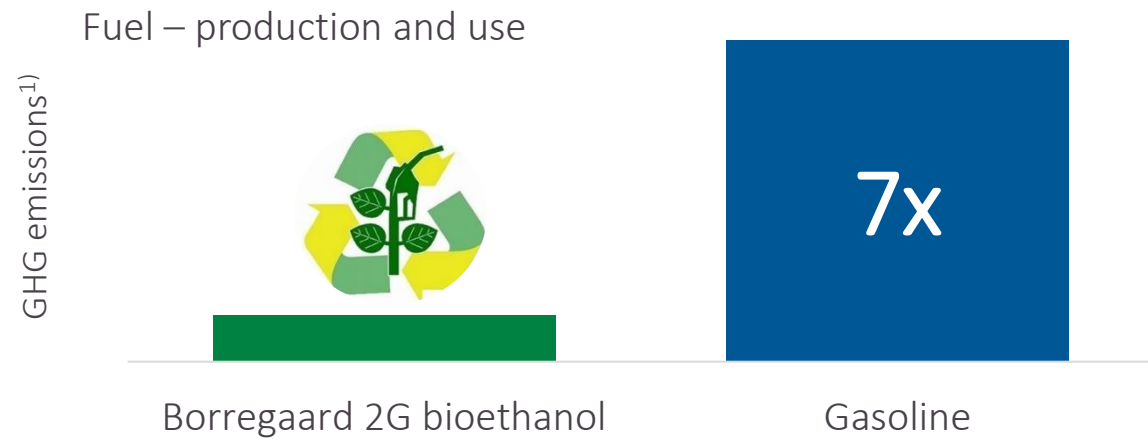
- Biofuel, disinfectant, pharmaceutical industry, home and personal care products, paint/varnish, car care

### Capacity

- 20 million liters

# Sustainability

## Favourable climate footprint



### 2<sup>nd</sup> generation bioethanol vs petroleum-based fuel

- Increased demand in different countries due to incentives

# Financial objectives and dividend policy

## Financial objectives

- ROCE<sup>2)</sup> >15% pre-tax over a business cycle
- IRR >15% pre-tax for expansion capex
- Average net working capital at 20% of operating revenues
- Replacement capex at depreciation level
- Maintain key financial ratios corresponding to an investment grade rated company
  - Leverage ratio<sup>1)</sup> targeted between 1.0 and 2.25 over time
  - First-time issuer rating of A-/Stable from Scope ratings in March 2023

## Borregaard's dividend policy

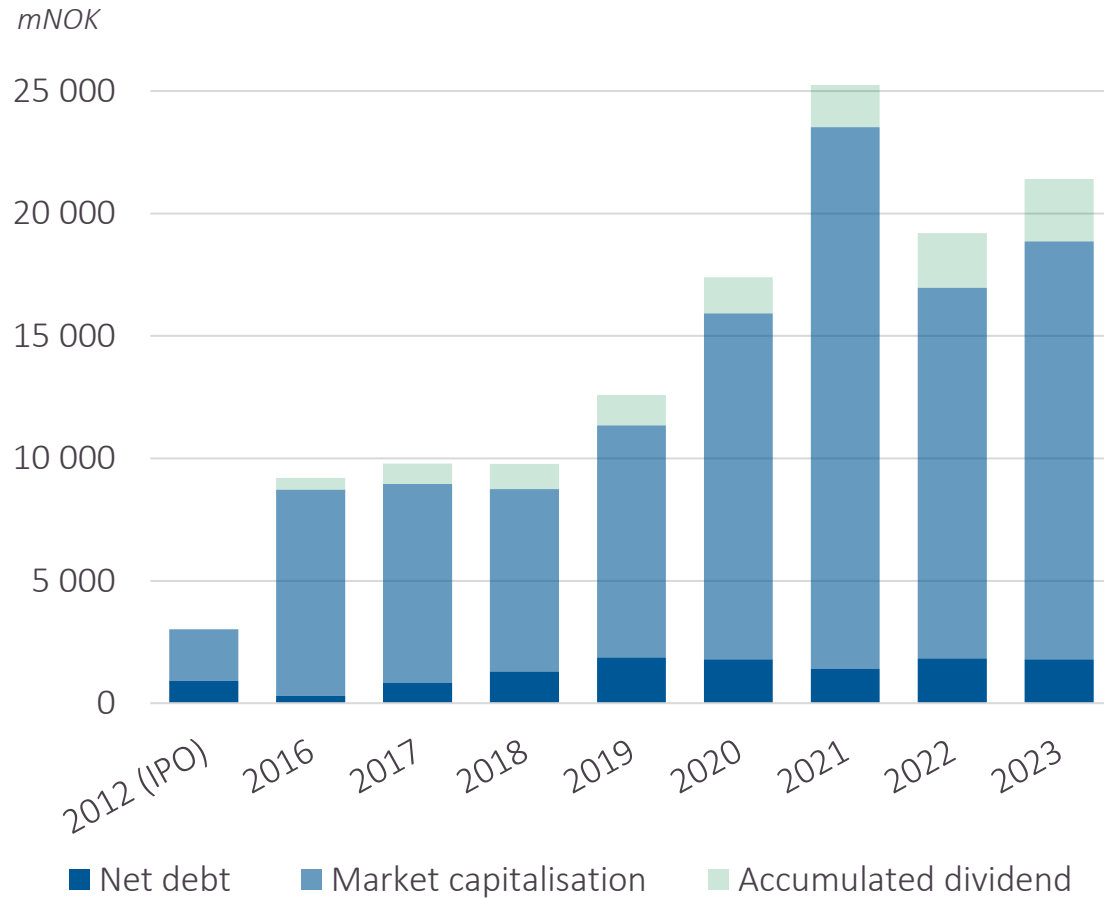
- To pay regular and progressive dividends reflecting Borregaard's expected long term earnings, free cash flows and expansion capex
- Annual dividend is targeted between 30% and 50% of net profit for the preceding fiscal year



<sup>1)</sup> Net interest-bearing debt divided by last twelve months' EBITDA<sup>2)</sup>

<sup>2)</sup> Alternative performance measure – see Appendix

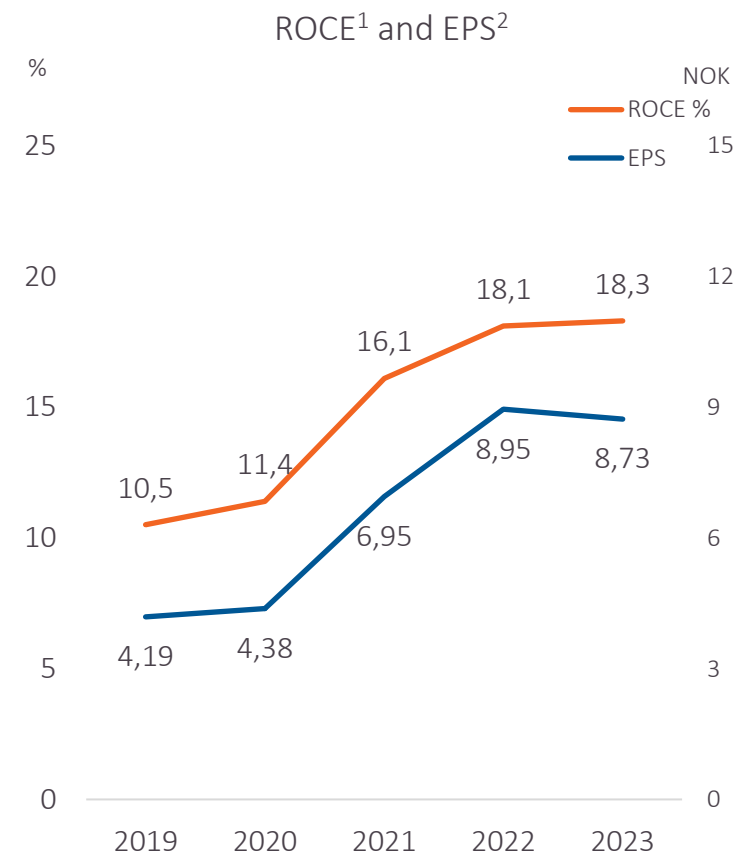
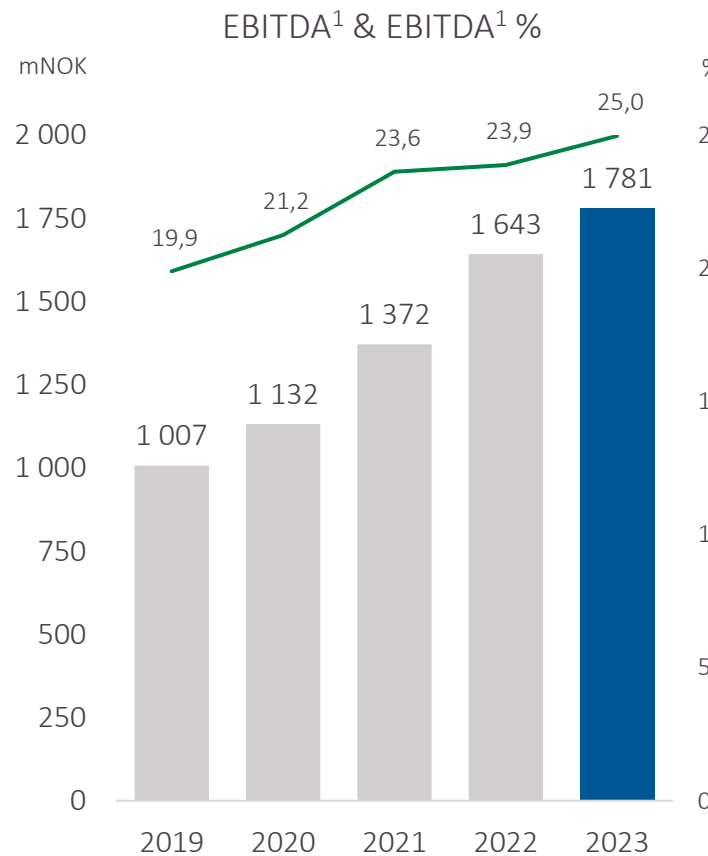
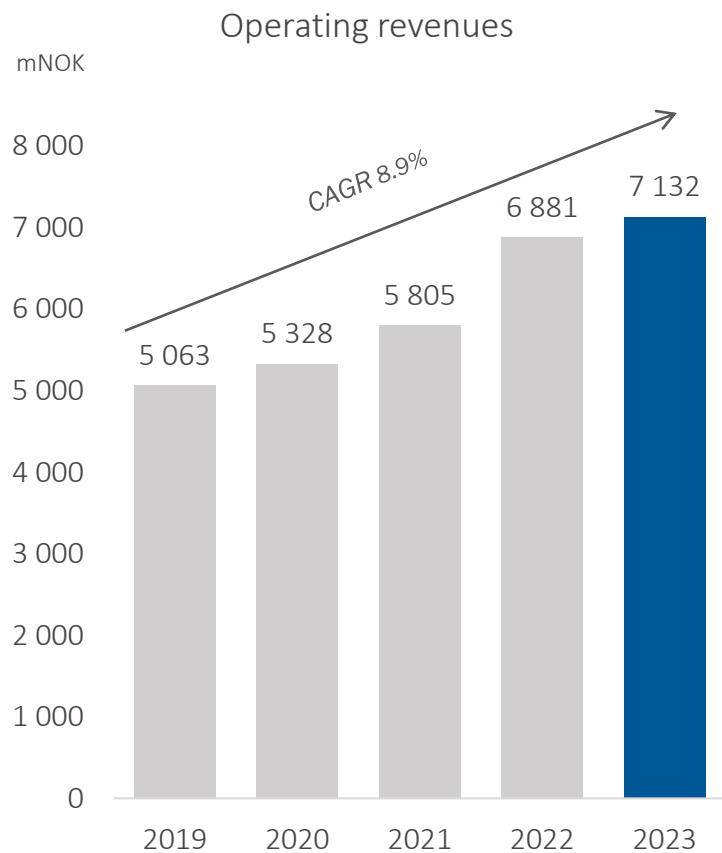
# Value creation since IPO



	CAGR
Share price, including reinvestment of dividend	23.9%
Enterprise value = market cap + net debt	17.7%

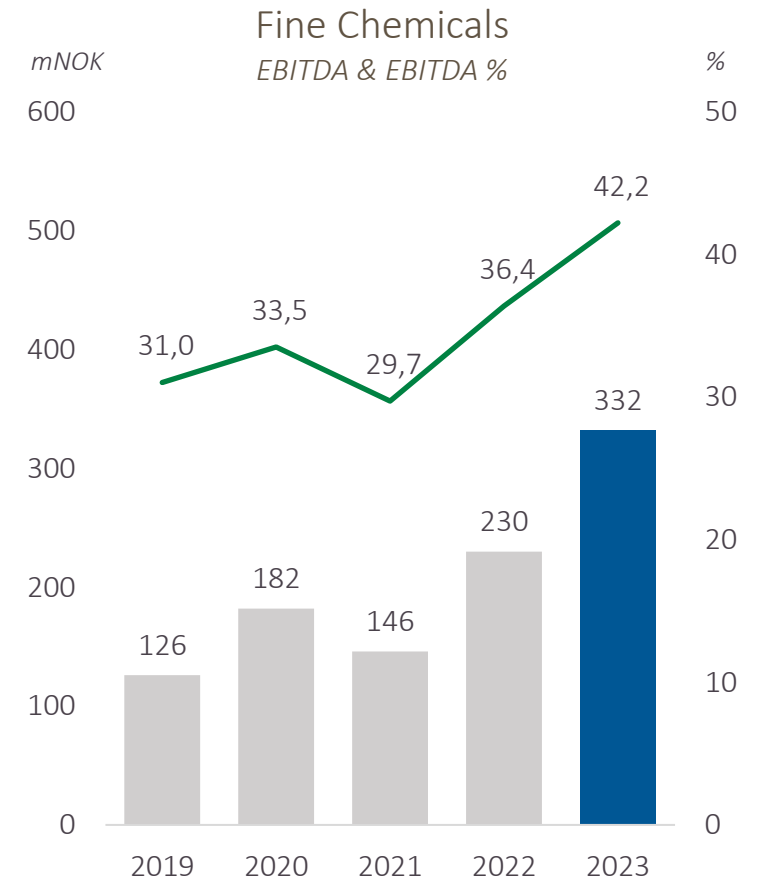
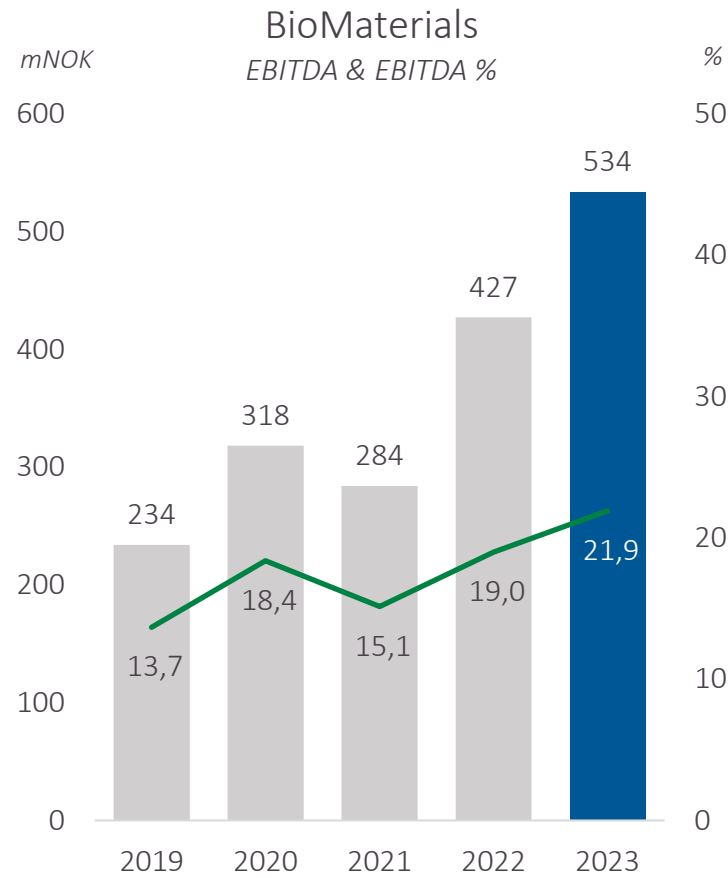
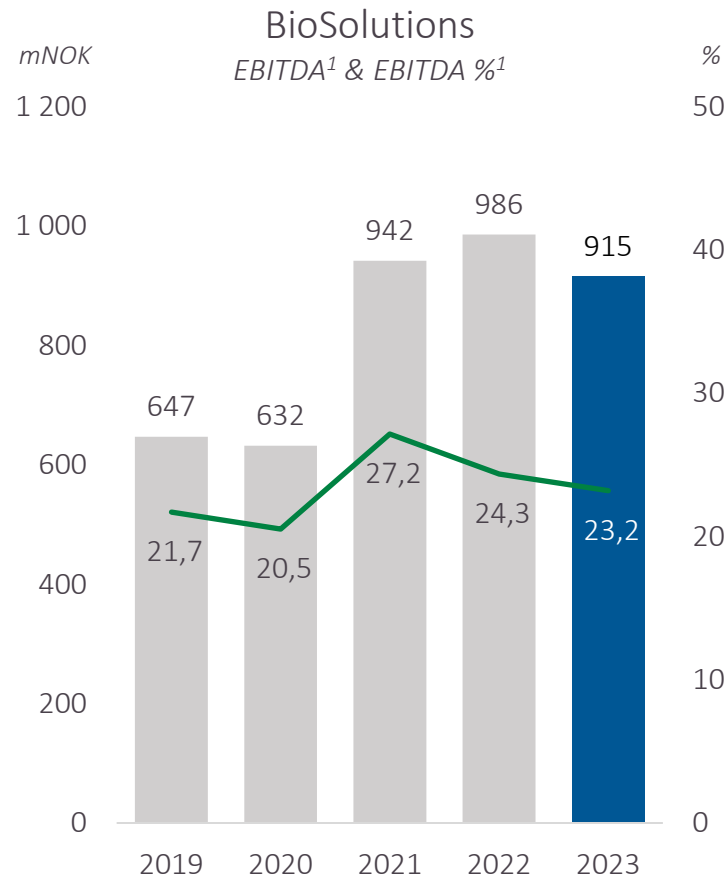


# Key figures 2019 – 2023

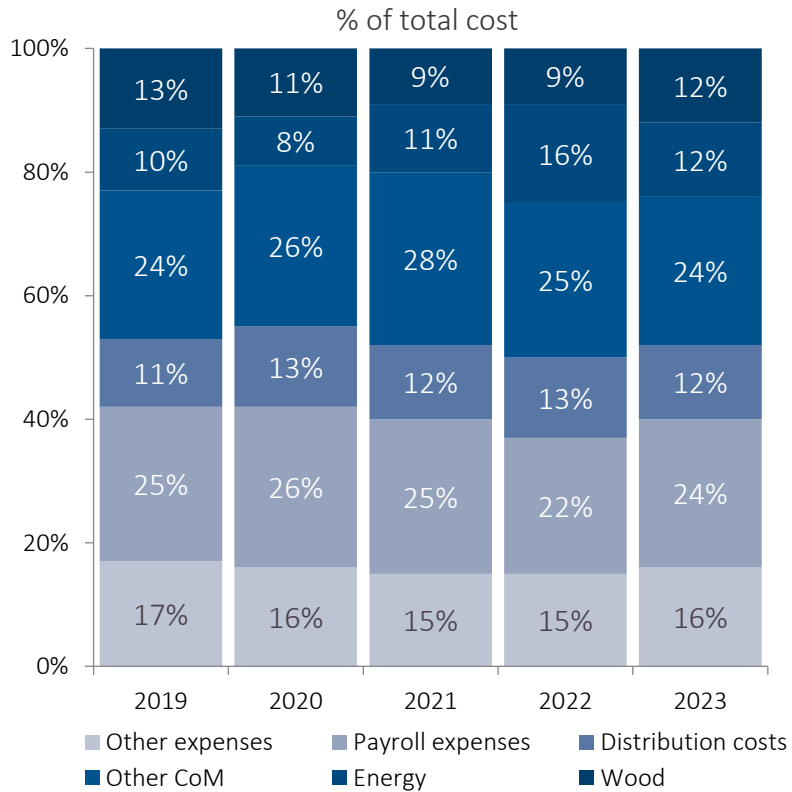


1 Alternative performance measures – see Appendix  
 2 Earnings per share

# Key segment figures 2019 – 2023



# Key cost items 2019-2023



- Total costs in 2023 were 5.4 billion NOK
- 7.2% CAGR from 2019 to 2023
- Main cost components' share of total costs relatively stable over time

Wood	<ul style="list-style-type: none"> <li>• 75%-85% sourced from Norway, the rest mainly from Sweden</li> <li>• Annual price and volume contracts, mid-year adjustments occur</li> <li>• Includes inbound logistics, ~30% of wood cost</li> </ul>
Energy	<ul style="list-style-type: none"> <li>• Energy consumption: Heat energy 2/3, electricity 1/3</li> <li>• Heat energy: Base load mainly covered by renewable energy sources, peak-load mainly covered by LNG, light oil and spot electricity.</li> <li>• Electricity: Long term contracts to 2029 &amp; 2033 for substantial part of needed volume</li> </ul>
Other CoM	<ul style="list-style-type: none"> <li>• Chemicals<sup>1)</sup> and other raw materials like lignin raw material</li> <li>• Internal production of caustic soda</li> <li>• Contract manufacturing of petrochemical-based vanillin</li> <li>• Change in inventories</li> </ul>
Distribution costs	<ul style="list-style-type: none"> <li>• Most products sold delivered customer</li> <li>• Logistical optimisation important, especially for Biopolymers</li> </ul>
Payroll expenses	<ul style="list-style-type: none"> <li>• Continuous productivity improvement, including de-manning and cost reduction activities</li> </ul>
Other expenses	<ul style="list-style-type: none"> <li>• Repair and maintenance, external services, rental/leasing and other operating expenses</li> </ul>

<sup>1)</sup> Main chemicals are caustic soda, salt, sulphur and epichlorohydrine

# Sensitivity on EBITDA<sup>1)</sup>

- Global presence, diversified product portfolio and GDP-driven demand reduce market risk
- Oil price affects demand and competition in certain markets, but main effect historically has been on NOK FX rate
- Significant FX exposure, softened by FX hedging<sup>2)</sup> in the medium term
- No major single component in other cost of materials
- Distribution costs: Most products sold “delivered customer”
- Other expenses are repair and maintenance, external services, rental/leasing etc.

Sensitivity of 1% change

(based on 2023)



<sup>1)</sup> Alternative performance measure – see appendix

<sup>2)</sup> Hedging based on expected net cash flow (EBITDA)

- Base hedge - 75%/50% on a rolling basis for 6/9 months for major currencies

- Extended hedge - 75%/50% of the next 24/36 months if USD and EUR are above predefined levels

# Resilient specialisation strategy in the face of a potential recession

Specialised products less exposed to cyclicity

Reduced exposure to cyclical markets over time

- Sales to concrete admixtures reduced by >50%
- Fully specialised cellulose business

A recession will affect demand in general

Diversified market strategy

- 800 products to numerous applications
- Global presence
- Takes risk out of integrated operations





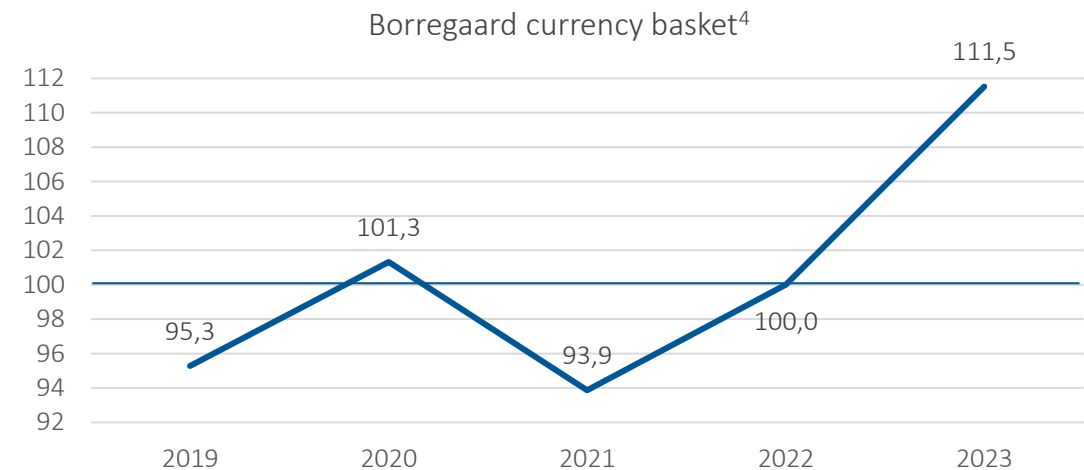
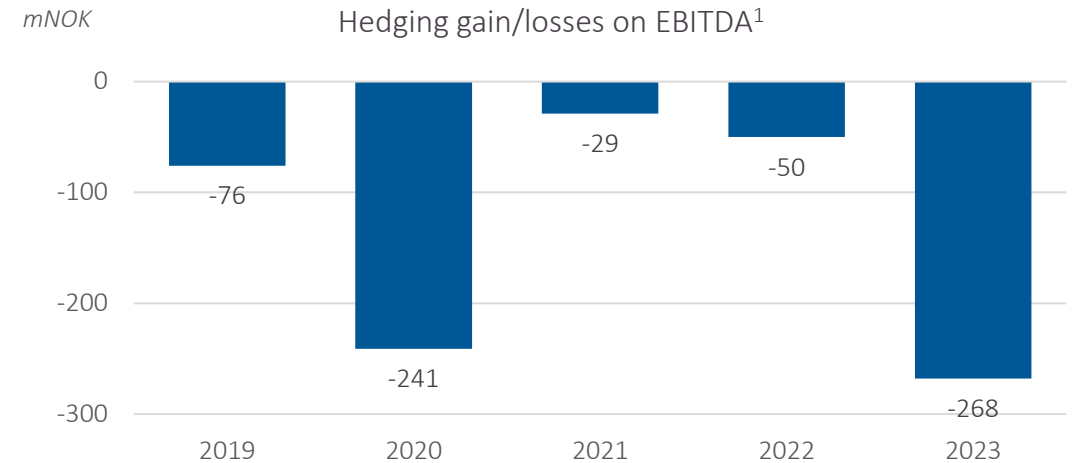
# FX impact and policy

## Currency hedging strategy

- Purpose is to delay effects of currency fluctuations and secure competitiveness
- Hedging based on expected net cash flow (EBITDA<sup>1</sup>)<sup>2</sup>
- Base hedge - 75%/50% on a rolling basis for 6/9 months for major currencies
- Extended hedge - 75%/50% of the next 24/36 months if USD and EUR are above defined levels
  - EUR; gradually increased at effective rates from 10.00 to 10.50
  - USD; gradually increased at effective rates from 9.00 to 9.50
- Contracts<sup>3</sup> - 100% hedged
- Balance sheet exposure hedged 100%
- Net investments in subsidiaries hedged up to 90% of book value in major currencies

## FX exposure

- Borregaard's revenues are primarily in USD or EUR, while costs are primarily in NOK
- Net FX exposure in 2022 USD: 53% (approximately 197 mUSD)
- EUR: 42% (approximately 147 mEUR)
- Other: 5% (GBP, BRL, JPY, SEK)



1 Alternative performance measures - see Appendix

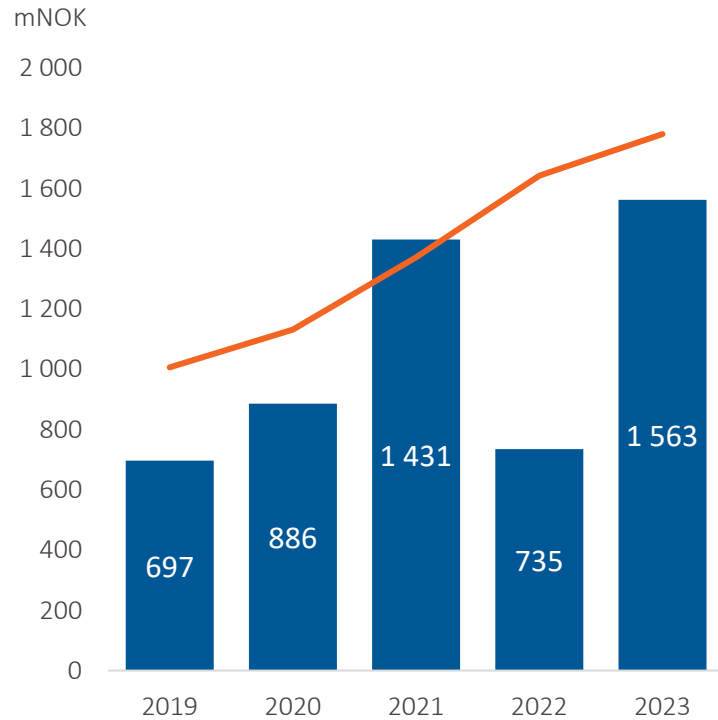
2 Net cash flow hedging mainly in the Norwegian company

3 Strict definitions for contracts applied for 100% hedging (mutually binding agreement in which price, currency, volume and time are defined)

4 Currency basket based on Borregaard's net exposure in 2022 (=100)

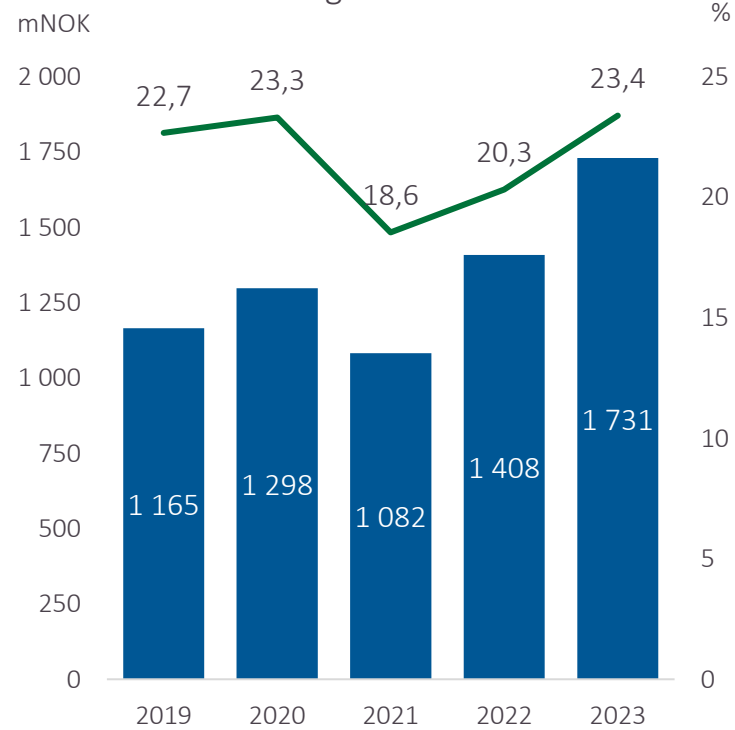
# Cash flow, NWC and investments 2019 – 2023

Cash flow from operating activities



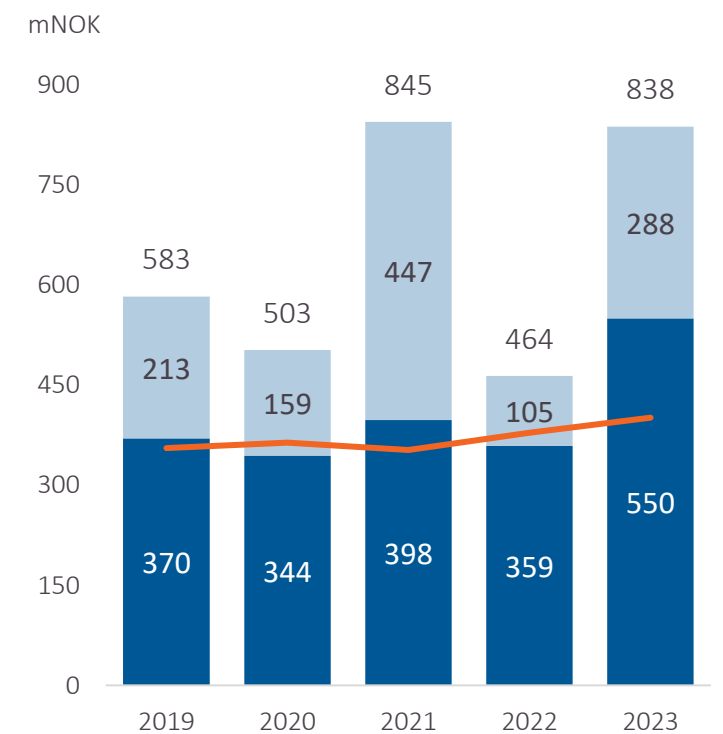
■ Cash flow from operating activities ■ EBITDA<sup>1</sup>

Average NWC



■ NWC avg ■ % of OpRev ex hedging

Investments



■ Replacement ■ Expansion ■ Depr. ex IFRS16

# Continuous reduction of emissions and effluents

## 2030 environmental targets

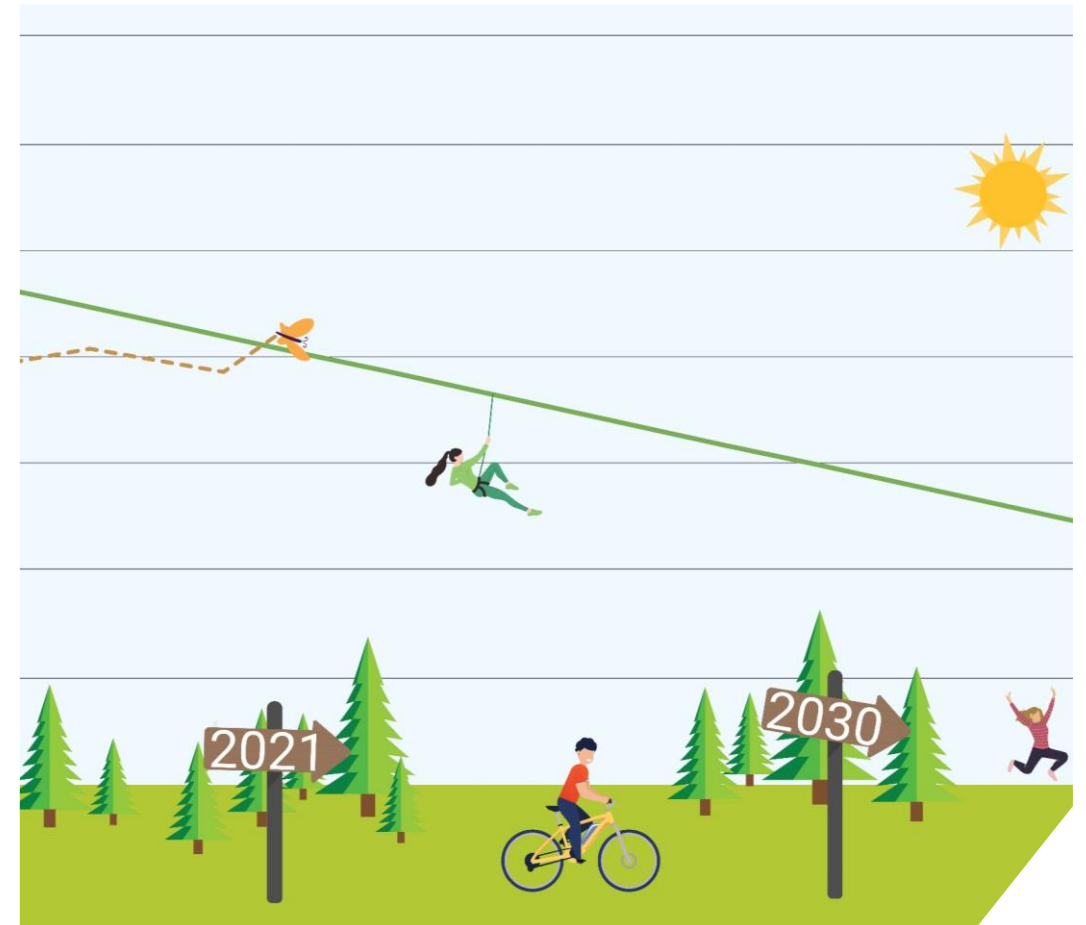
- 42% reduction in CO<sub>2</sub> emissions from 2020
  - *Electrification, energy conservation, innovative heat recovery*
- 30-50% reduction in effluents to water (COD) from 2020
  - *Process improvements and wastewater incineration technology*

## Financial consequences and strategic considerations

- Preliminary investment estimate 650-850 mNOK for 2023 to 2025
  - *First investment of 230 mNOK announced Q4-22*
- Supporting specialisation and value growth investments
- Increased flexibility between energy sources
- Improved environmental footprint
- Increased barriers to entry and strengthened competitive position

*Sustainability offering new opportunities*

Environmental investments will improve competitive position



# Environmental investment of 230 mNOK at the biorefinery in Norway

## Improved environmental footprint

- Removing absolute dependency on LNG
- 30,000 tonnes annual reduction of CO<sub>2</sub> emissions
- Part of investment plan announced at CMD

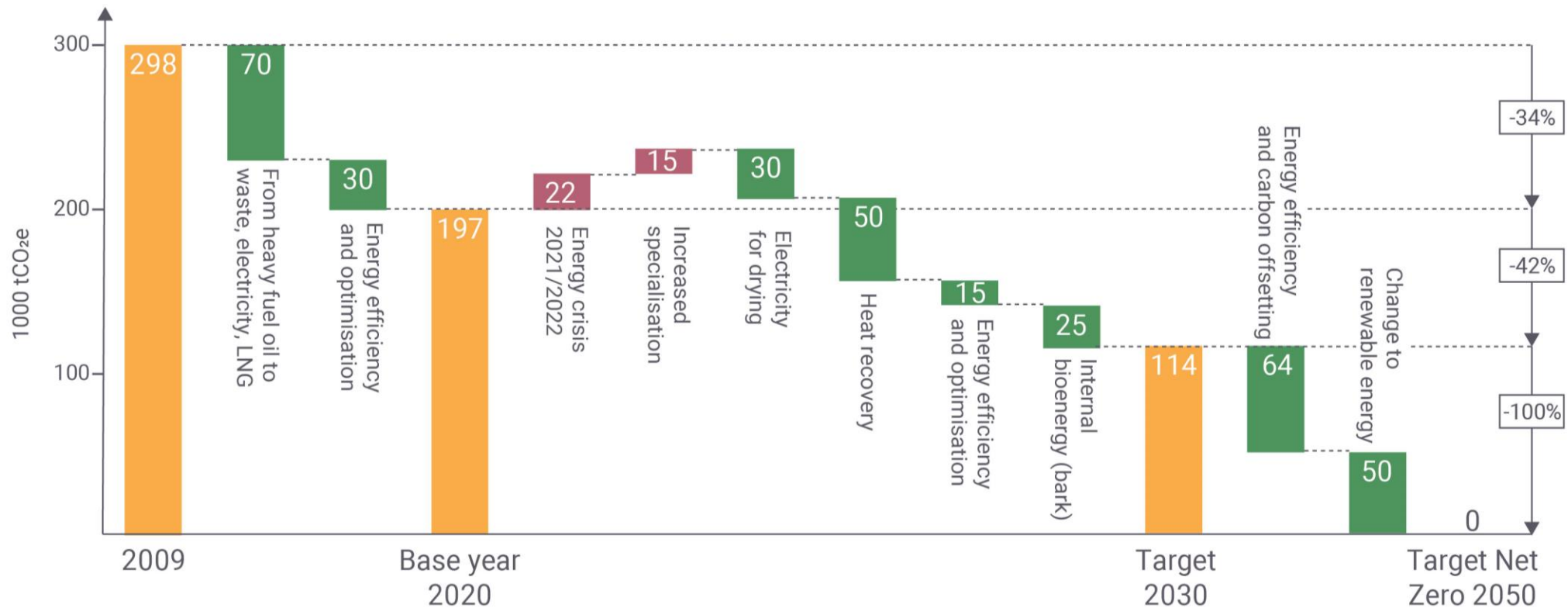
## Increased energy flexibility and efficiency

- Significant cost reduction potential
- Introducing more options to switch between alternative energy sources
- Improved energy efficiency

Completion in H1-24



# Borregaard transition plan to cut scope 1 and 2 GHG emissions





# Significant potential for further specialisation and value growth

- Continuous specialisation and product mix improvements
- Innovation portfolio and sustainability offering new opportunities
- Exploit full potential of previously completed expansion investments
- Additional expansion opportunities at the Sarpsborg biorefinery
  - Further specialisation of lignin-based biopolymers
  - Increased flexibility in the integrated production
  - Volume expansion through debottlenecking for speciality cellulose, lignin-based biopolymers and bioethanol
  - Preliminary investment estimate 650-900 mNOK for 2023 to 2025, mainly medium size projects
    - *Announced investments total 341 mNOK so far*
- Further development of the Sarpsborg site is a low-risk investment and raises barriers to entry



# Specialisation investment in BioSolutions

## 70 mNOK expansion investment in lignin-based biopolymers

- Debottlenecking of existing facilities at the Sarpsborg biorefinery
- Volume expansion for highly specialised products
- Low-risk investment with known technology to Borregaard
- Reduction in CO<sub>2</sub> emissions<sup>1)</sup>

## New capacity will gradually be phased into attractive niche markets

- Completion in H1-24

## Targeted application areas

- Batteries<sup>2)</sup>
- Oilfield chemicals, agrochemicals, pigments and dyes



<sup>1</sup> Scope 1 emissions

<sup>2</sup> For more information on Borregaard's product portfolio of high-performing battery additives: <https://www.borregaard.com/markets/batteries/>

# Specialisation investment in BioSolutions

## 100 mNOK expansion investment

- 1,000 mtds<sup>1</sup>/year demonstration plant at Sarpsborg biorefinery
- Completion mid-2025, gradual start-up from H2-24

## New green technology platform for high-end applications

- Next generation lignin-based biopolymers
- Granulation<sup>2</sup> of existing and new products

## Targeted application areas

- Home care applications like detergents, laundry and cosmetics
- Industrial cleaners and water treatment
- Agriculture



<sup>1</sup> Metric tonnes dry solid

<sup>2</sup> Granulation is a method of making free-flowing granules from liquids

# Investment forecast 2024-2025

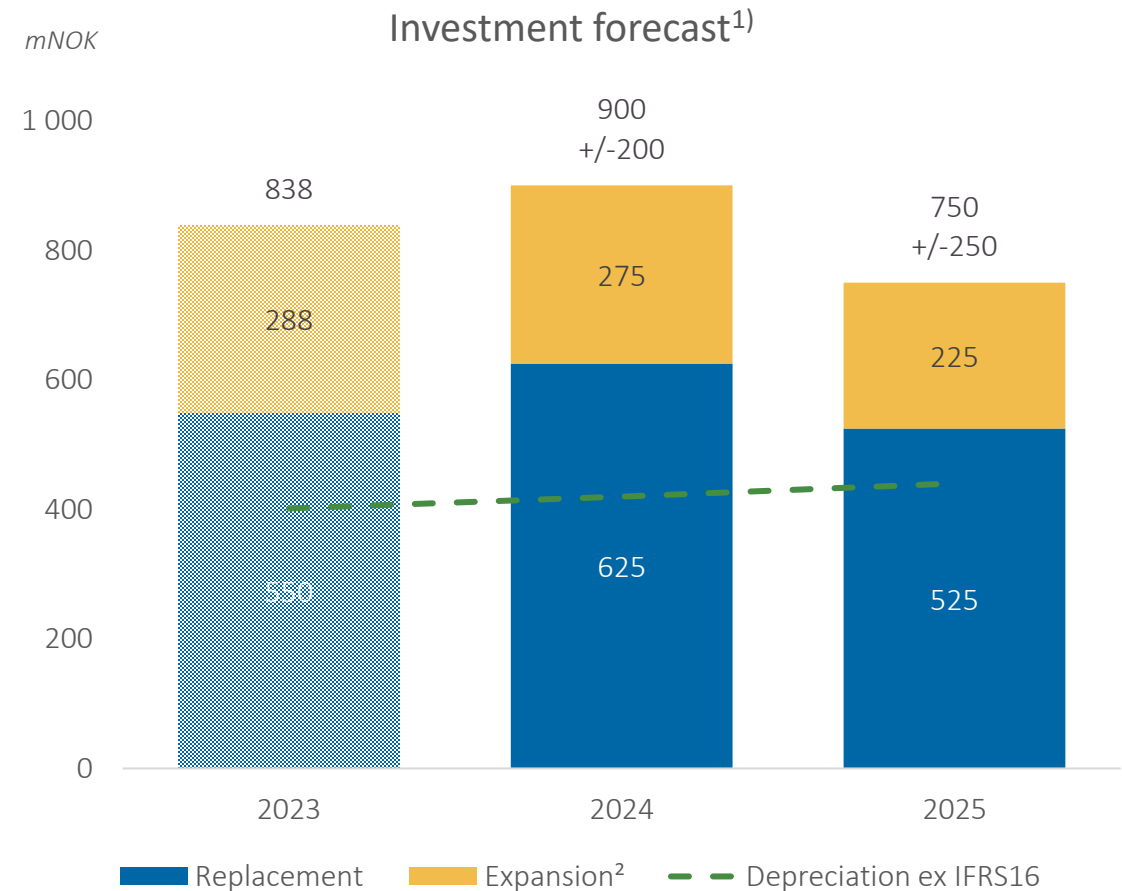
## Replacement investments

- Targeted CO<sub>2</sub> and COD reductions explain above target level investments
- Supporting specialisation and value growth investments

## Expansion investments

- Further specialisation, increased flexibility and debottlenecking at the Sarpsborg site
- Increased ownership in Alginor and investments in biobased start-ups (2023)

## New projects may lead to additional investments

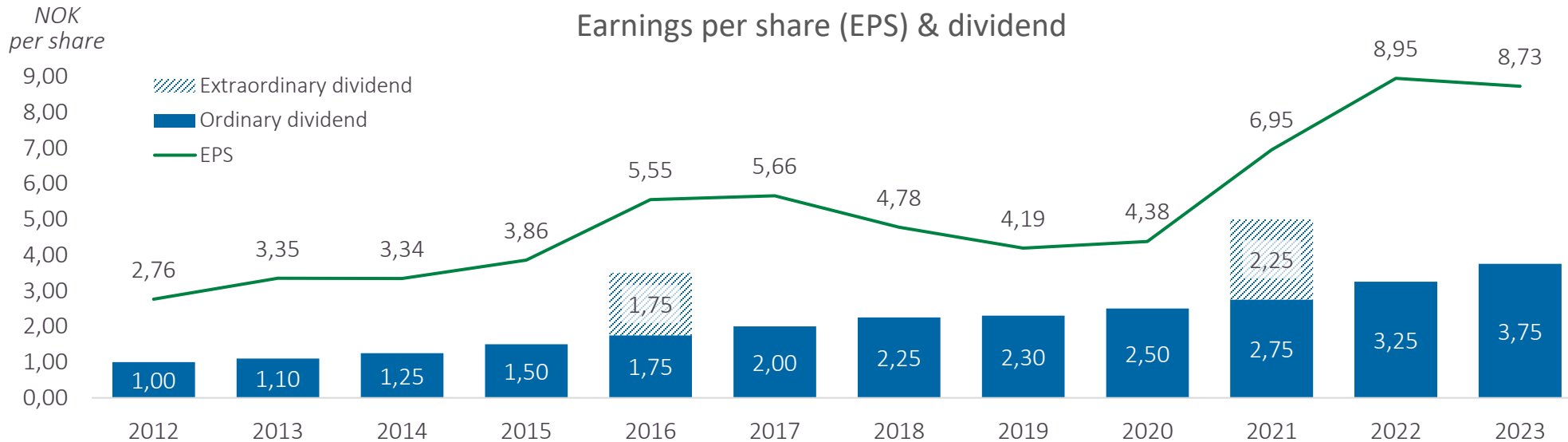


<sup>1)</sup> Uncertainty is related to final investment decisions, timing of investment payments, execution time and risk and unexpected events

<sup>2)</sup> Alternative performance measures - see Appendix



# Increasing EPS, progressive dividends and solid financial position



## Increasing EPS and dividend

- 11.3% average annual growth in EPS from 2012
- Dividend
  - Target: Regular and progressive dividends, between 30% and 50% of net profit
  - Extraordinary dividend for 2016 and 2021

## Solid capital structure

- Leverage ratio<sup>1)</sup> 1.01 and equity ratio<sup>1)</sup> 54% (Q4-23)
  - Maintain key financial ratios corresponding to an investment grade rated company
  - Leverage ratio target: Between 1.0 and 2.25
- Substantial undrawn credit facilities

<sup>1)</sup> Alternative performance measures - see Appendix



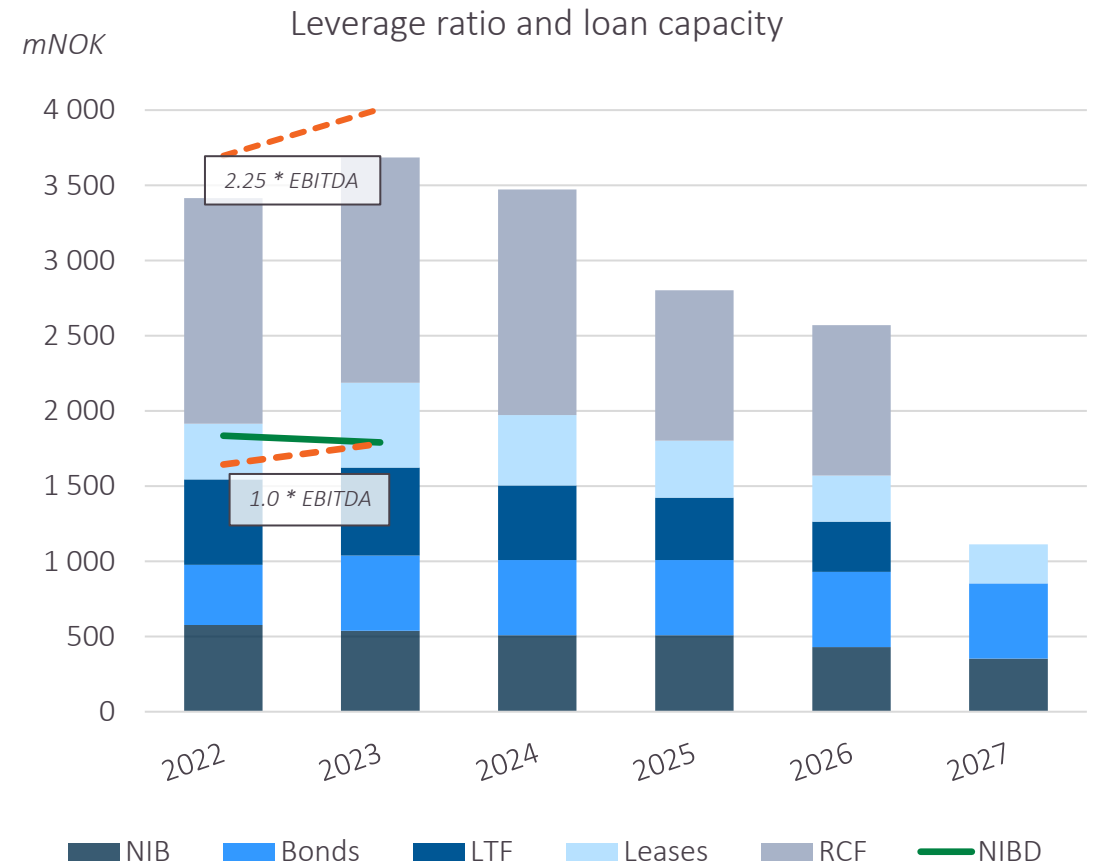
# Capital structure – credit facilities and maturities

## Long term credit facilities

- Revolving credit facilities (RCF) in July 2020, maturity 2025 and 2027, margin linked to sustainability targets
- 60 mUSD term loan for LignoTech Florida (LTF), maturity 2027
- 500 mNOK 5-year green bonds, maturity 2028 (issued June 2023)
- Nordic Investment Bank (NIB) loans; 40 mEUR - maturity 2024, 50 mUSD - maturity 2032

## Short term credit facilities

- 225 mNOK overdraft facilities
- 15 mUSD overdraft facility in LignoTech Florida



<sup>1)</sup> Alternative performance measures - see Appendix

# Highly experienced and proven management team



**CEO**

**Per A. Sørli**

- CEO since 1999
- Member of management team since 1990
- **34 years** with Borregaard



**Per Bjarne Lyngstad**

- CFO
- 26 years in current position
- **36 years** with Borregaard



**Liv Longva**

- SVP Strategic Sourcing
- In current position from June 2020
- **16 years** with Borregaard



**Tom Erik Foss-Jacobsen**

- EVP BioSolutions
- In current position from May 2019
- **25 years** with Borregaard



**Kristin Misund**

- SVP R&D and Business development
- In current position from May 2019
- **31 years** with Borregaard



**Gisle Løhre Johansen**

- EVP Speciality Cellulose and Fine Chemicals
- In current position from May 2019
- **33 years** with Borregaard



**Dag Arthur Aasbø**

- SVP Organisation and Public Affairs
- 16 years in current position
- **31 years** with Borregaard



**Ole Gunnar Jakobsen**

- Plant Director - Sarpsborg Site
- 16 years in current position
- **29 years** with Borregaard



**Sveinung Heggen**

- General Counsel
- 11 years in current position
- **11 years** with Borregaard

# Appendix – alternative performance measures

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In the discussion of the reported operating results, financial position and cash flows, Borregaard refers to certain measures which are not defined by generally accepted accounting principles (GAAP) such as IFRS. Borregaard management makes regular use of these alternative performance measures and is of the opinion that this information, along with comparable GAAP measures, is useful to investors who wish to evaluate the company's operating performance, ability to repay debt and capability to pursue new business opportunities. Such alternative performance measures should not be viewed in isolation or as an alternative to the equivalent GAAP measure.

- *EBITDA*: Operating profit before depreciation, amortisation and other income and expenses.
- *EBITDA margin*: EBITDA divided by operating revenues.
- *Equity ratio*: Equity (including non-controlling interests) divided by equity and liabilities.
- *Expansion investments*: Investments made in order to expand production capacity, produce new products or to improve the performance of existing products. Such investments include business acquisitions, pilot plants, capitalised R&D costs and new distribution set-ups.
- *Other income and expenses*: Non-recurring items or items related to other periods or to a discontinued business or activity. These items are not viewed as reliable indicators of future earnings based on the business areas' normal operations. These items will be included in the Group's operating profit.
- *Leverage ratio*: Net interest-bearing debt divided by last twelve months' EBITDA.
- *Net interest-bearing debt (NIBD)*: Interest-bearing liabilities minus interest-bearing assets.
- *Return on capital employed (ROCE)*: Last twelve months' capital contribution (operating profit before amortisation and other income and expenses) divided by average capital employed based on the ending balance of the last five quarters. Capital employed is defined as the total of net working capital, intangible assets, property, plant and equipment, right-of-use assets and investment in joint venture minus net pension liabilities.