

October 2024

# Business model, businesses & strategy

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# Borregaard investor message | Business model & strategy

## Biorefinery business model

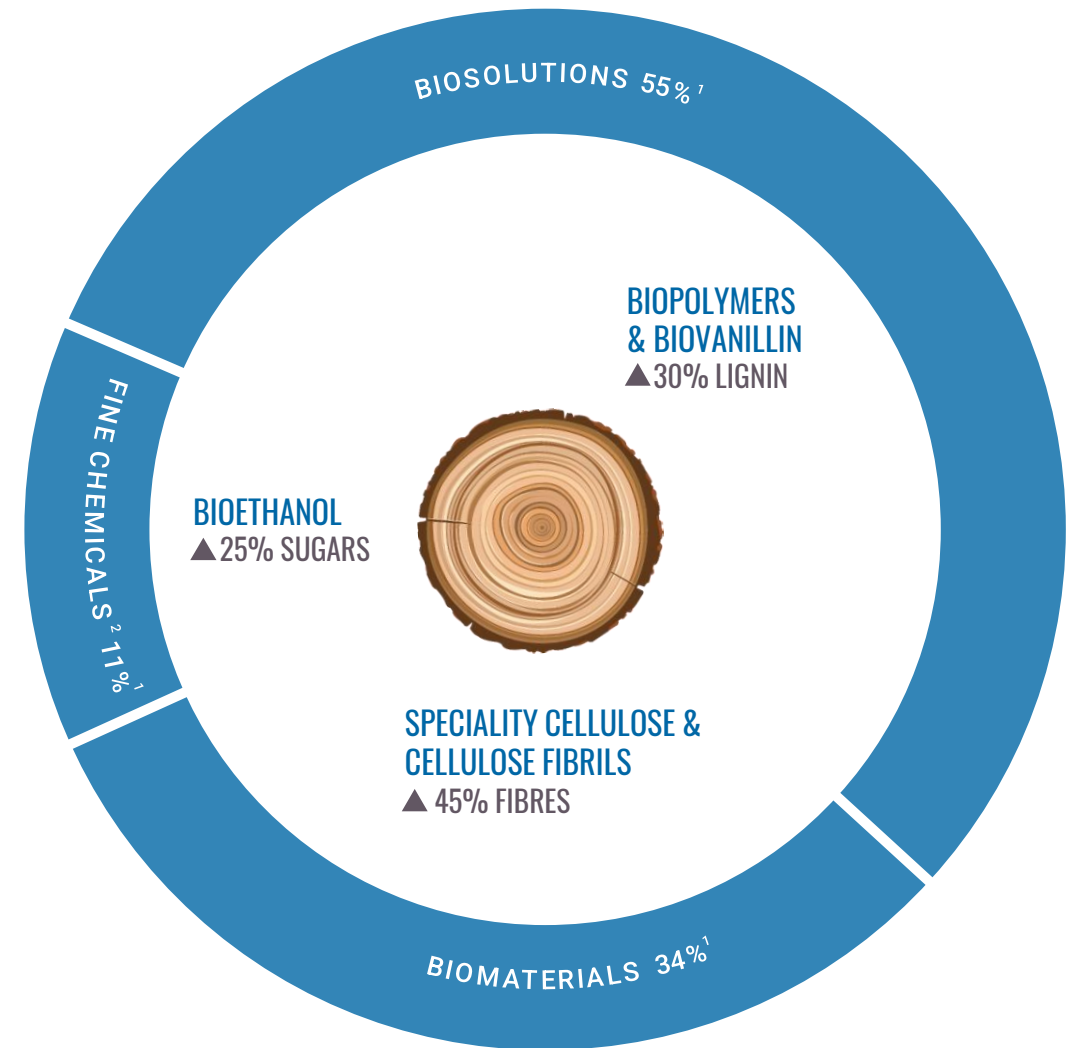
- Biochemicals vs. petrochemicals
- High value added through full raw material utilisation
- A diversified market strategy (800 products) takes risk out of the integrated operations

## Specialisation strategy

- Global niche player in markets with high barriers to entry
- Leading market positions through application knowledge and proximity to markets
- Strong innovation efforts and continuous improvement
- Competence is the main competitive advantage

## Strategic priorities

- Key actions next 3–5 years to execute specialisation strategy



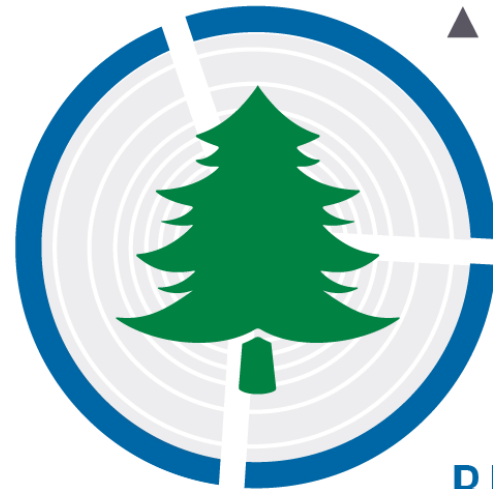
<sup>1</sup> Segment revenue as a % of sales revenue 2023

<sup>2</sup> Leading producer of fine chemical intermediates for contrast agents, significant producer of 2nd generation bioethanol. Only the latter is made from wood.

# Borregaard is a global leader in biochemicals | Business model & strategy

*High value added through full raw material utilisation  
Sustainable and environmentally friendly substitutes  
for petrochemicals*

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



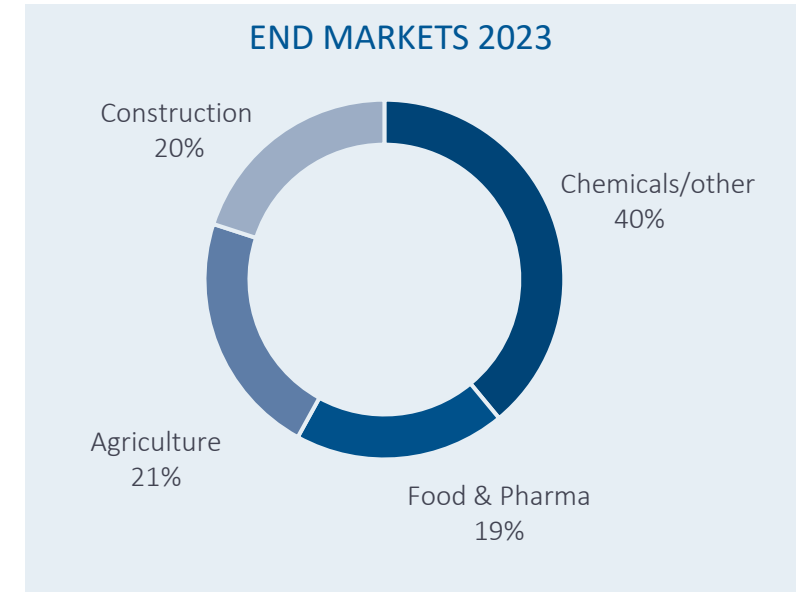
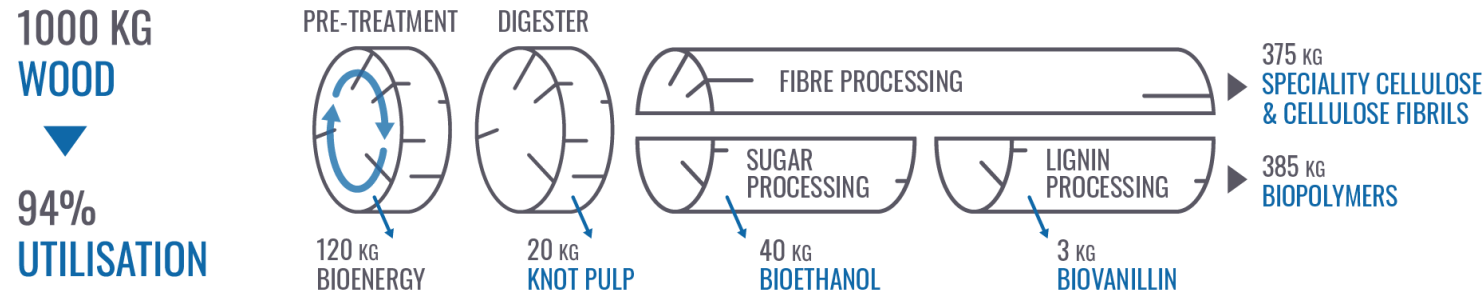
**BIOPOLYMERS  
& BIOVANILLIN**  
▲ 30% LIGNIN  
(BINDING MATERIAL)

**BIOETHANOL**  
▲ 25% SUGARS

# One of the world's most advanced biorefineries

Business model & strategy

## INTEGRATED PRODUCTION SYSTEM SERVING DIVERSE MARKETS



*Integration models: Own integrated, Partner integrated and Independent*

### 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 | Business model & strategy

## BioSolutions 55%



- Largest supplier, technology leader in lignin-based biopolymers with global markets
- Only producer of wood-based vanillin

## BioMaterials 34%

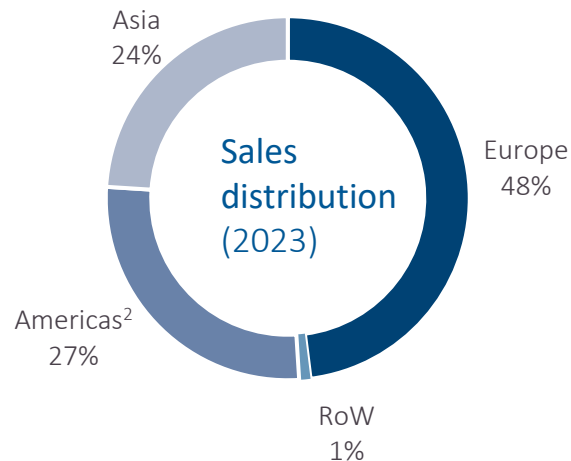


- Leading global speciality cellulose supplier
- Pioneer in cellulose fibrils

## FineChemicals 11%



- Leading producer of fine chemical intermediates for contrast agents
- Significant producer of advanced 2G 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

1 Segment revenue as a % of sales revenue 2023  
2 USA/Canada 21%, rest of Americas 6%

# The specialisation strategy | Business model & 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 is 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



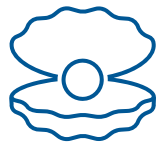
**Sustainability** – key decision criterion to innovation and new initiatives



**The Borregaard Way** – our corporate culture and core values



Increasing momentum for bio-based products – considerable potential for further specialisation and value growth



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

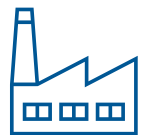
Considerable potential for further specialisation and value growth

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



Specialisation and value growth will take priority

- Significant potential for upgrade of product portfolios in BioSolutions and BioMaterials
- Well positioned in attractive markets with high expected growth rates
- Significant potential for geographic market penetration
- Increased specialisation is the cumulative effect of numerous innovation projects



Explore expansion and debottlenecking opportunities at the Sarpsborg biorefinery

- Low-risk investment raising barriers to entry



Consumer and investor attention drives demand for greener solutions

- EU Green Deal
- Taxonomy
- Science Based Targets initiative

# Strategic priorities | Business model & strategy

## 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



# Sustainability – integral part of market offering | Sustainability

## 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
- Bio-based: Natural raw materials preferred
- EHS<sup>3</sup>: Non-toxic, harmless products

1 PEFC: Programme for the Endorsement of Forest Certification, FSC: Forest Stewardship Council

2 Life Cycle Analysis

3 Environment, Health and Safety



## Science Based Targets for GHG emissions

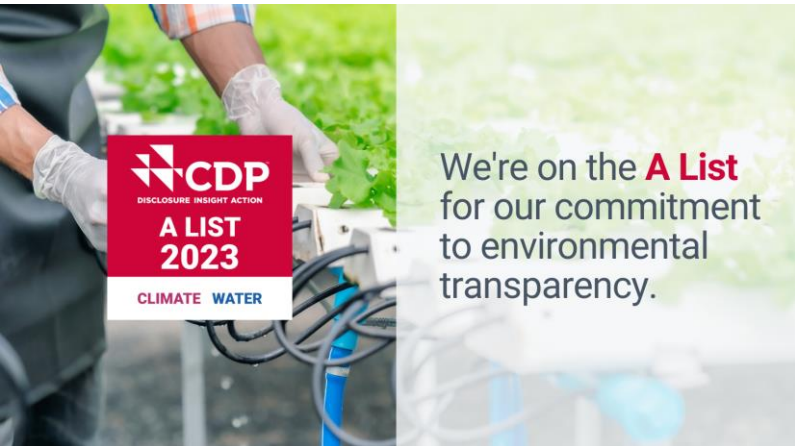
- Approved by Science Based Targets initiative in 2022
- Targeted reductions in GHG emissions (scope 1 and 2):
  - 42% absolute reduction by 2030 (base year = 2020)
  - Net-zero target, 90% absolute reduction by 2050
- Targets in line with 1.5°C goal in Paris Agreement and Norwegian Climate Law

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

- Top 25 out of 21,000 companies scored
  - A within Climate Change (6 years in a row)
  - A within Water security
  - A- within Forest

## Gold status in EcoVadis Supply Chain

- Top 5% of over 130,000 reporting companies



# Transition plan supporting the specialisation strategy | Sustainability

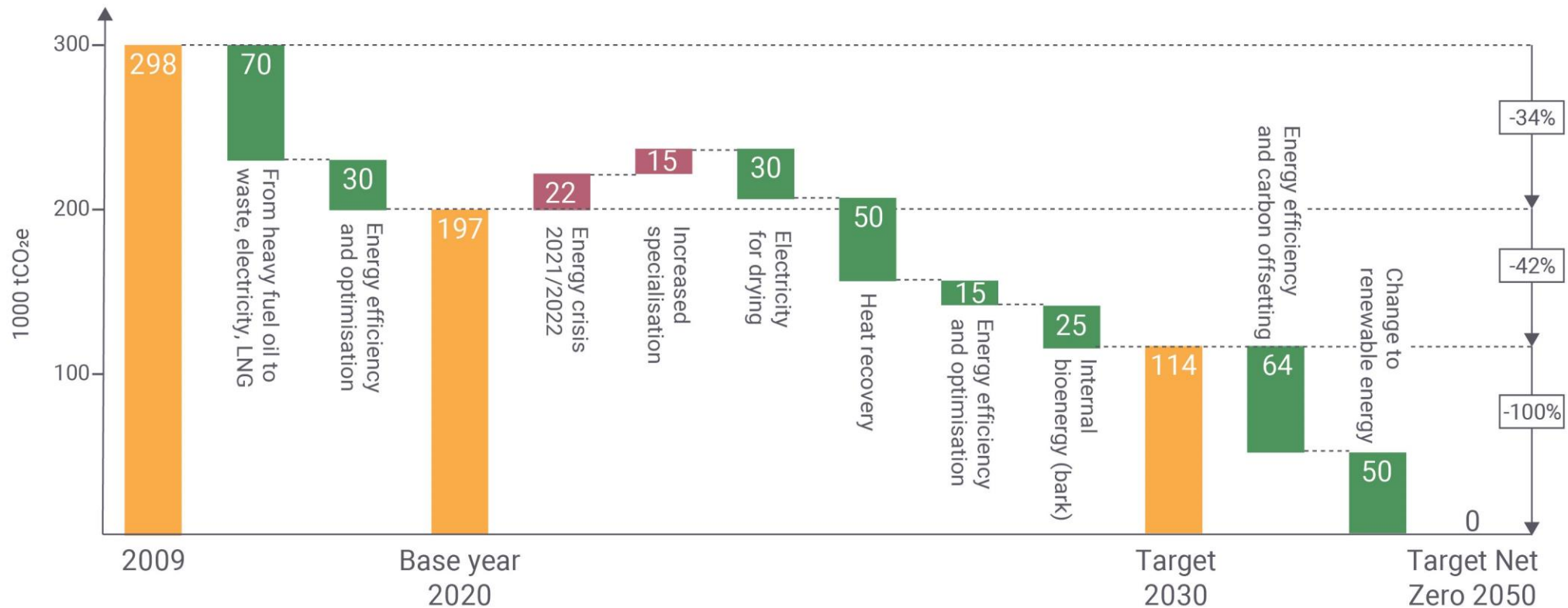
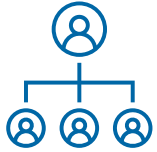


Figure showing Borregaard transition plan for scope 1 and 2 GHG emissions

# Market driven innovation | Innovation



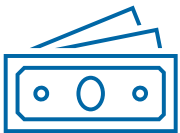
## Innovation Management Teams (IMT)

- Interdisciplinary team
- Strategic projects
- Resource use
- Programmes over several years



## 97 employees in R&D and innovation

- R&D centres in Norway, USA and India
- 28 PhDs

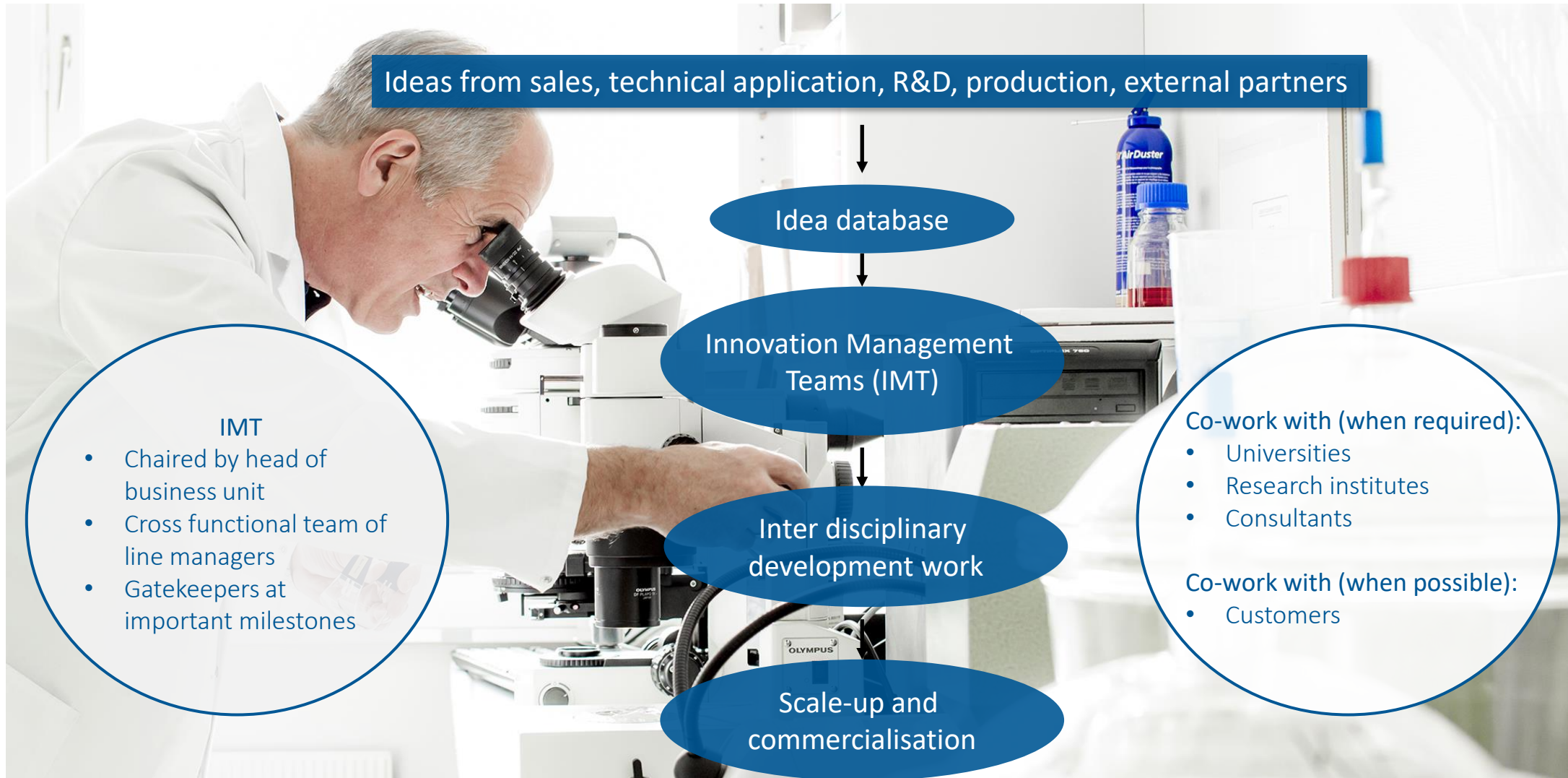


## Significant R&D and innovation efforts

- 2023: NOK 211 million (≈3% of revenues)
- Innovation rate of 16%<sup>1</sup> in 2023



# Business driven innovation model | Innovation



# Overview of innovation portfolio | Innovation



## Application-oriented innovation



Crop protection, plant nutrition, feed

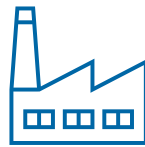


Batteries, pigments, inks, home care and resins



Concrete, coatings, packaging

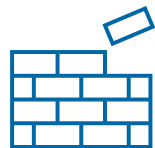
## Process-oriented innovation



Process improvements  
Capacity, quality, sustainability



Cellulose Acetate  
Purity



Cellulose ethers  
Viscosity

## Business development



Disruptive innovation  
New processes and products



Bio-based investments  
Investing for the long term







# Borregaard investing in bio-based start-ups | Bio-based investments

## Selection criteria

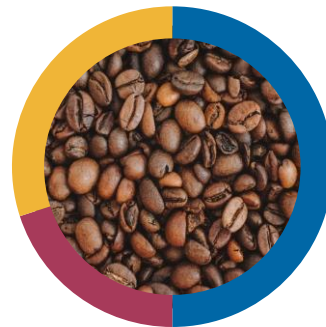
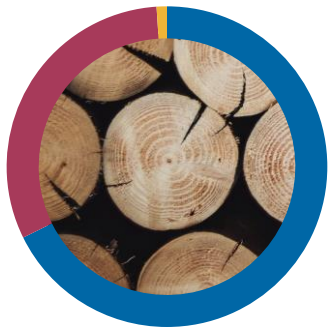
- Conversion of bio-based raw materials to chemicals and materials
- Strong ESG profile
- Specialisation potential
- Synergies with Borregaard's existing business and competence
- Significant revenue potential
- Time to market < 5 years
- Geography: Nordics > Europe > Global



# Investments in bio-based start-ups | Bio-based investments

	About the company	Ownership and size of investment	Follow-up of investment
	Harvesting and biorefining of macroalgae to ingredients for pharmaceutical and nutraceutical applications ( <i>Norway</i> )	<ul style="list-style-type: none"><li>• 35% ownership fully diluted</li><li>• Total investment ~419 mNOK</li></ul>	<ul style="list-style-type: none"><li>• 2 board positions</li><li>• Nomination committee</li><li>• Collaboration in projects</li><li>• Joint funding applications</li></ul>
	Biorefining of spent coffee grounds to ingredients within personal care, human nutrition and agriculture ( <i>Denmark</i> )	<ul style="list-style-type: none"><li>• 12% ownership fully diluted with 3 mEUR investment</li><li>• Option to increase ownership to 34% by Jan 2026 with additional 9.25 mEUR investment</li></ul>	<ul style="list-style-type: none"><li>• 1 board position</li><li>• Joint funding application</li></ul>
	Processing of technical lignins from biorefineries for use in personal care as well as industrial applications ( <i>Austria</i> )	<ul style="list-style-type: none"><li>• 12% ownership</li><li>• Total investment 1 mEUR</li></ul>	<ul style="list-style-type: none"><li>• Advisory board</li></ul>
	Biorefining of farmed macroalgae to ingredients within food, health & wellness, skincare and materials ( <i>Scotland</i> )	<ul style="list-style-type: none"><li>• 1% ownership</li><li>• Total investment 0.15 mUSD</li></ul>	

# Strategic fit of bio-based investments | Bio-based investments



- Fibres, polysaccharides, sugars
- Lignin, polyphenols
- Lipids, resins, oils, proteins

# BioSolutions in Borregaard | BioSolutions

## 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



Product performance depends on the pulping process and the raw material

## Sulphite pulping process

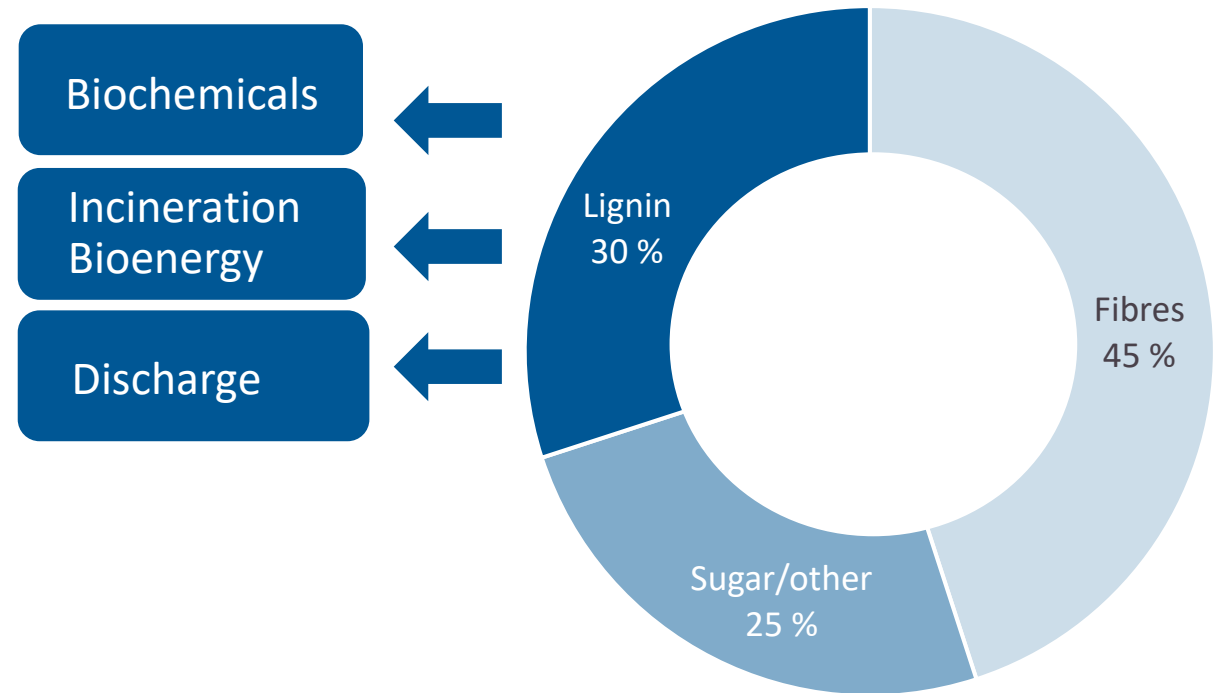
- Versatile lignin used in a variety of products/applications
- Quality depends on the chemicals base
- Water soluble
- Limited number of sulphite mills

## 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



# Lignin biopolymers: Properties, advantages and applications | BioSolutions

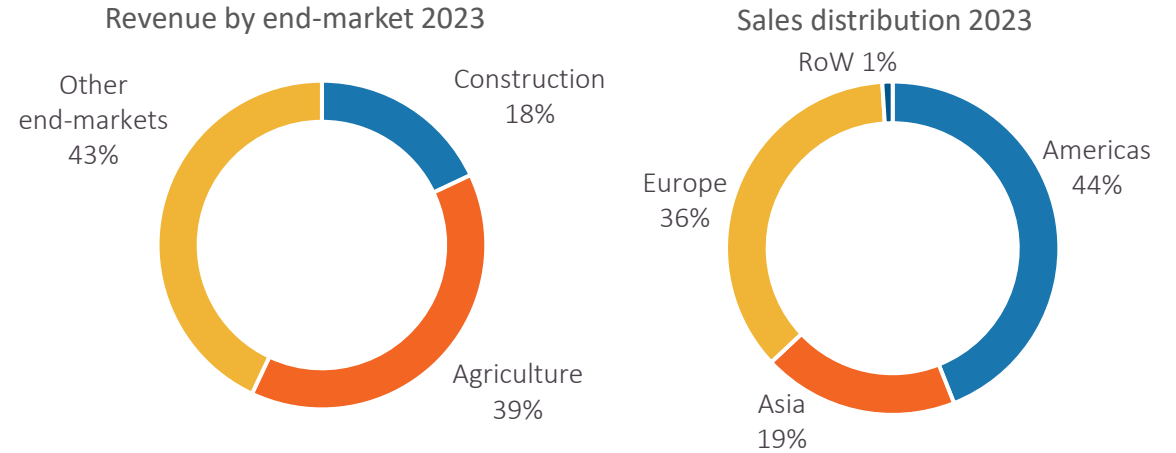


# Diversification: 600 products to 2,700 customers | BioSolutions

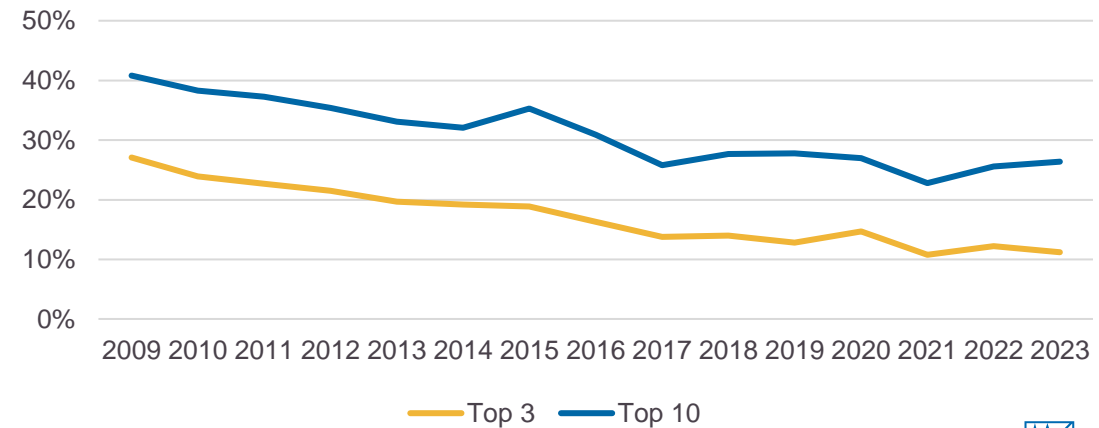
## BioSolutions properties and applications

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>

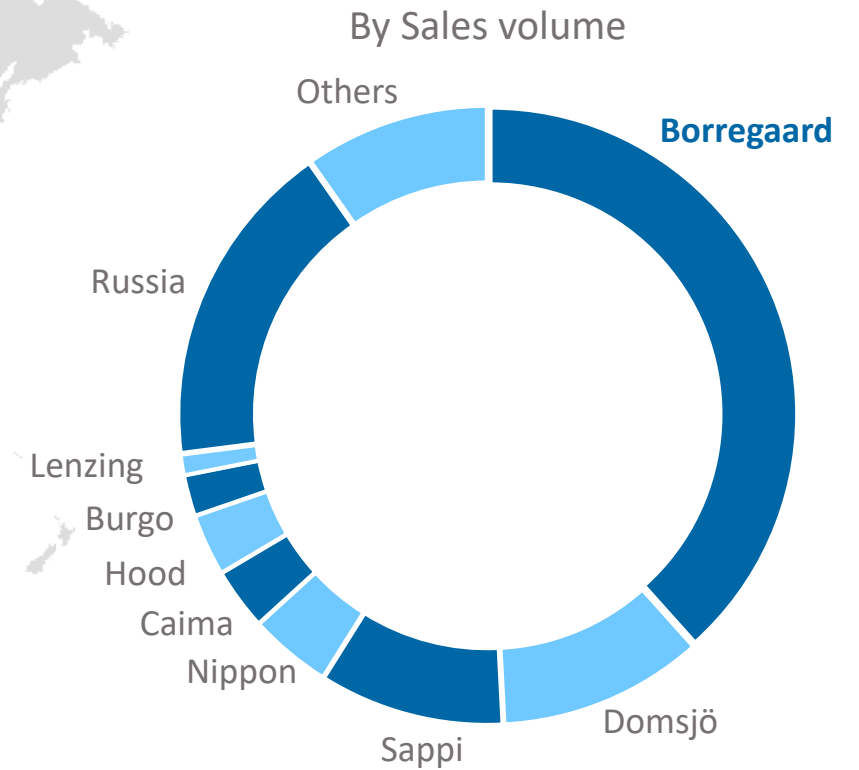
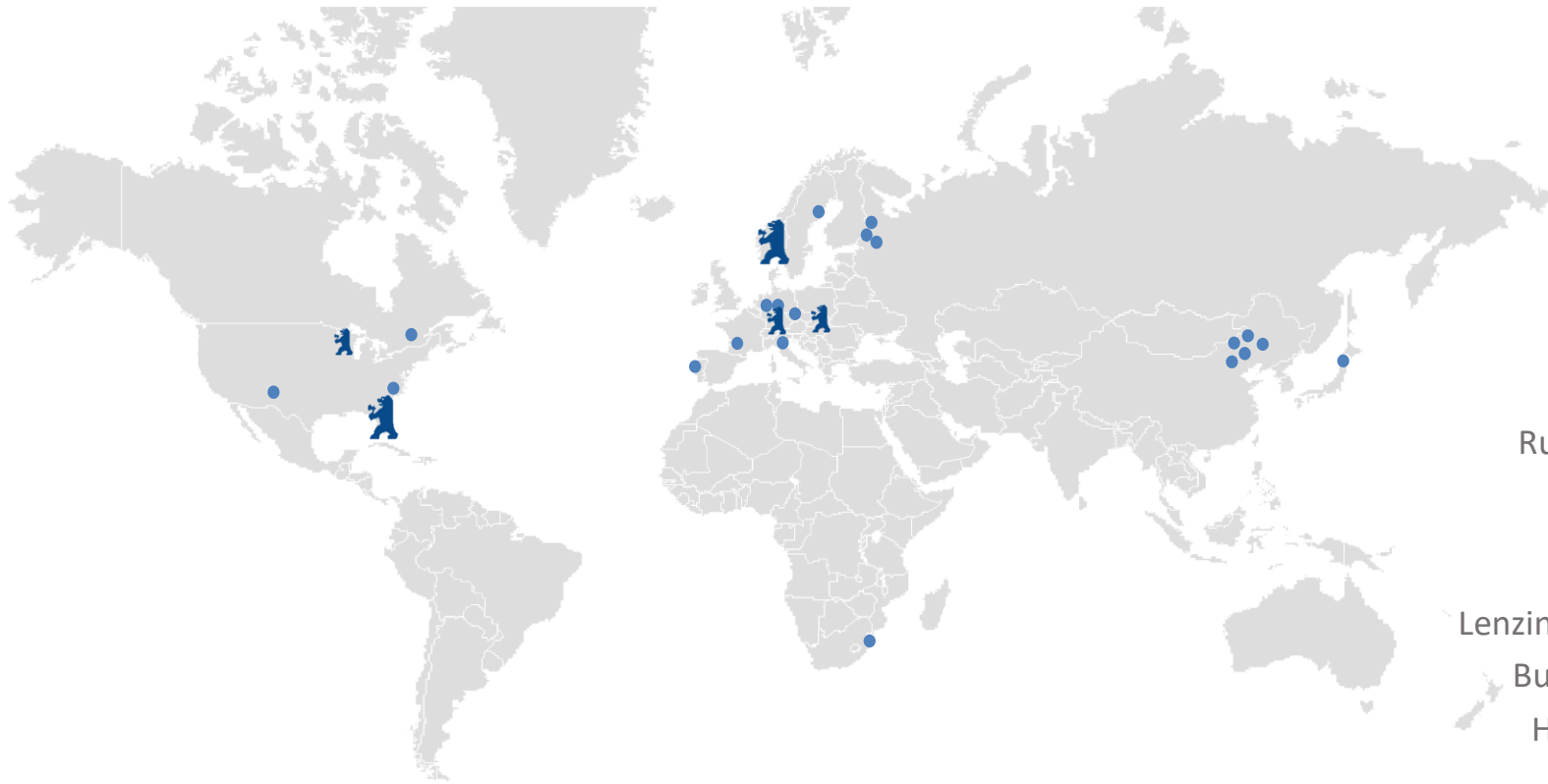
## Revenues by end-market and region



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



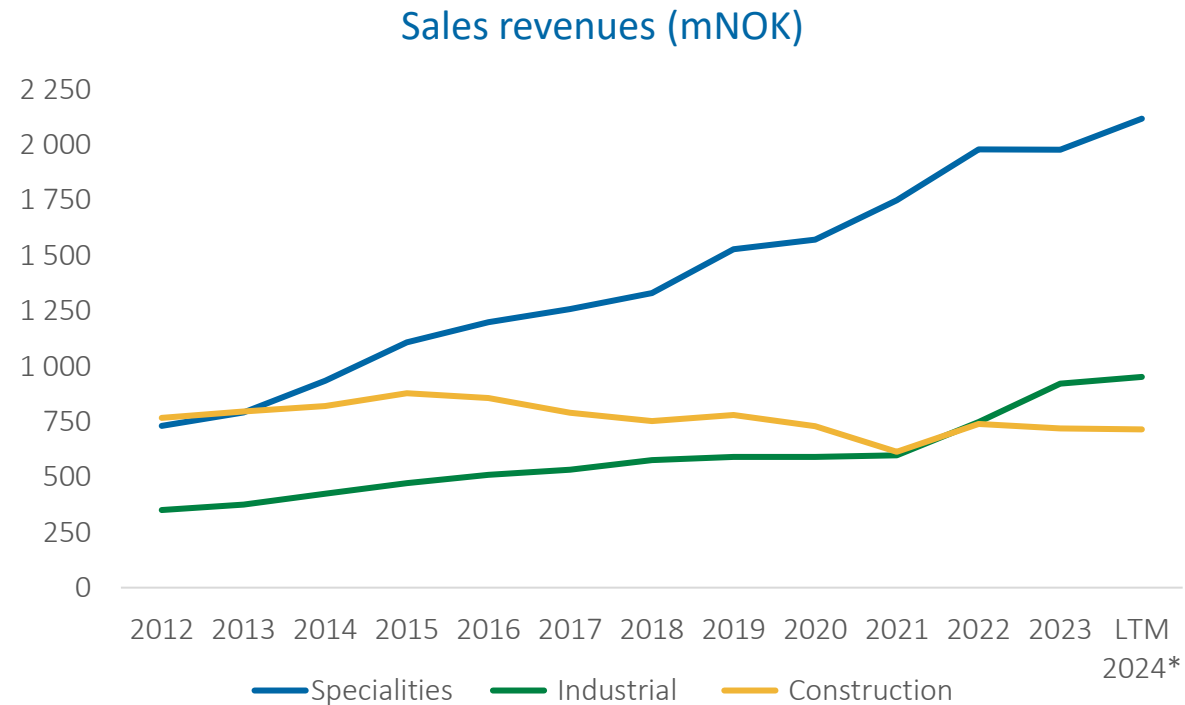
# Global lignin supply 2023 | BioSolutions



Global lignin supply ~900 – 950,000 mtds



# Significant specialisation and value growth over time | BioSolutions



- Strong development in sales to Specialities
- Gross sales trebled in Specialities and nearly trebled in Industrial from 2012
- Significant portfolio optimisation
  - Optimised value
  - Reduced exposure to low-value markets
  - Less cyclicity

# Sustainability and regulatory offering new opportunities | BioSolutions

## Sustainability and regulatory trends – key driver for new business and innovation

- Customer GHG reduction initiatives – alternatives to fossil-based solutions
- Formaldehyde/microplastics/single-use plastics bans
- Antibiotics bans/restrictions and product authorisations

## Well-documented competitive edge in sustainability

- Life Cycle Assessments (LCAs) and Environmental Product Declarations (EPDs)
- Innovative digital solution tracking Borregaard's scope 3 impact on customer's GHG emissions (*in progress*)

## Proactive and tailored market communication

- Geographical market, application and customer specific



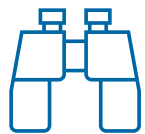
# Attractive growth opportunities in Asia | BioSolutions

## Fastest growing region and sustainability trends

- ~60% of world population (4.8 billion)
- Solid growth across the region and in key application areas

## Increased market presence in multiple countries

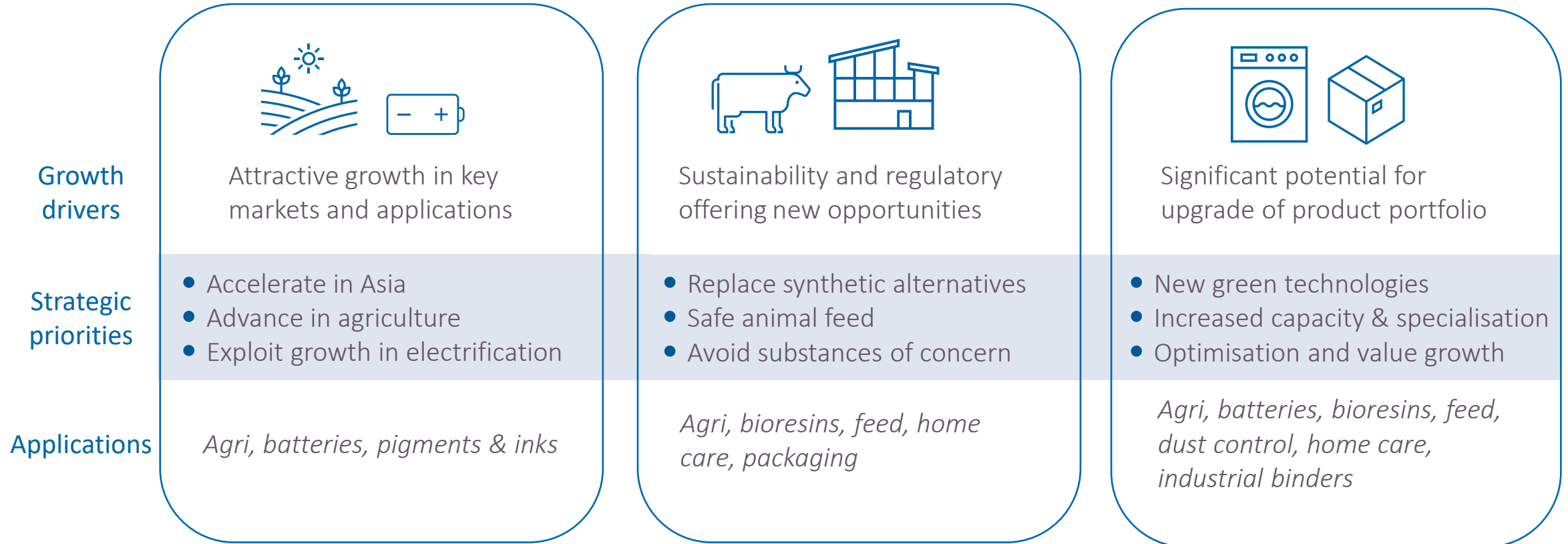
- More technical and commercial resources
- Increased R&D capability in India











Significant growth opportunities within agriculture and industrial applications



## Specialisation and value growth



# Biopolymers in agriculture | BioSolutions

Plant nutrition			Crop protection			Seed coating	Feed
							
Micronutrients	Soil conditioners /biostimulants	Granulated limestone and fertilizers	Pesticides	Biological pest control	Adjuvants	Encrusted and pelleted seeds	Animal feed
<ul style="list-style-type: none"> <li>• Ready-to-use micronutrients</li> <li>• Complexing agents</li> <li>• Rheology modifiers for suspensions</li> </ul>	<ul style="list-style-type: none"> <li>• Nutrient use efficiency</li> <li>• Resistance to abiotic stress</li> <li>• Organic carbon source</li> </ul>	<ul style="list-style-type: none"> <li>• Binder</li> <li>• Dedusting agent</li> </ul>	<ul style="list-style-type: none"> <li>• Dispersant</li> <li>• Binder</li> <li>• Rheology modifiers</li> </ul>	<ul style="list-style-type: none"> <li>• Dispersant</li> <li>• UV protection</li> <li>• Rheology modifiers</li> </ul>	<ul style="list-style-type: none"> <li>• Compatibility agent</li> <li>• Uptake enhancer</li> </ul>	<ul style="list-style-type: none"> <li>• Binder</li> <li>• Microplastic-free film formers</li> </ul>	<ul style="list-style-type: none"> <li>• Binder</li> <li>• Antioxidant</li> </ul>
8–9% CAGR	7–12% CAGR	7–12% CAGR	2–3% CAGR	11–12% CAGR	6–7% CAGR	8–9% CAGR	2–3% CAGR



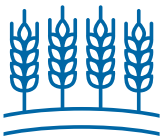
## Plant nutrition market

- CAGR 12%<sup>1</sup>



## Sustainable plant nutrition

- Maximises use of nutrients present in the soil or added during fertilization
- High internal competence and global R&D capabilities



## Soil conditioners and biostimulants increase crop yield

- Products with solubility, compatibility and agronomic performance
- Improves nutrient use efficiency, soil fertility and plant resistance to harsh conditions





## Biocontrol market

- CAGR 12%<sup>1</sup>



## Sustainability as a driver

- Market pull for more sustainable crop protection
- Biopesticides – pest control derived from natural source



## Bio-based formulation aids needed

- High internal competence and R&D capabilities
- Borregaard's biopolymers offer viability and efficacy



# Lead batteries: Borregaard products as industry standard | BioSolutions



## Lead batteries - essential battery technology

- Close to 45% of the world's rechargeable power<sup>1</sup>
- Low cost, safe and reliable



## Sustainable technology

- Most sustainable battery technology (99% recycling rate)
- Well suited for Energy Storage Systems (ESS)
- 70 mNOK expansion investment to meet future demand



## Indispensable for lead battery performance

- Improved battery life, capacity and cold temperature performance
- High internal competence and R&D capabilities
- Cooperation with industry on new products for ESS and auxiliary batteries for electric vehicles (EVs)







## Fastest growing battery technology

- Main battery technology for EV and ESS
- CAGR 27% towards 2030<sup>1</sup>



## Leveraging competence and technology

- High internal competence and global R&D capabilities
- New battery test lab in US

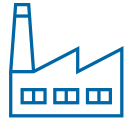


## New products launched

- Improved battery properties and cost reduction
- Sustainable and non-toxic
- Ongoing trials with key global players



# New green technology: Opportunities in high-end markets | BioSolutions



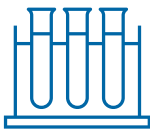
## Demonstration plant

100 mNOK investment, first step operational Q3 2024, completion mid-2025



## Natural polymer backbone

Modified lignin-based polymer from sustainably managed Norway spruce



## Unique features

Enables Borregaard to compete with advanced fossil-based polymers like e.g. polyacrylates



## Market opportunities

Home care, industrial cleaners, water treatment, coatings, agriculture, leather tanning, oil field chemicals



# New green technology: Entering the home care market | BioSolutions



## Sustainable formulation

5–8% dosage in dishwasher tablet or powder



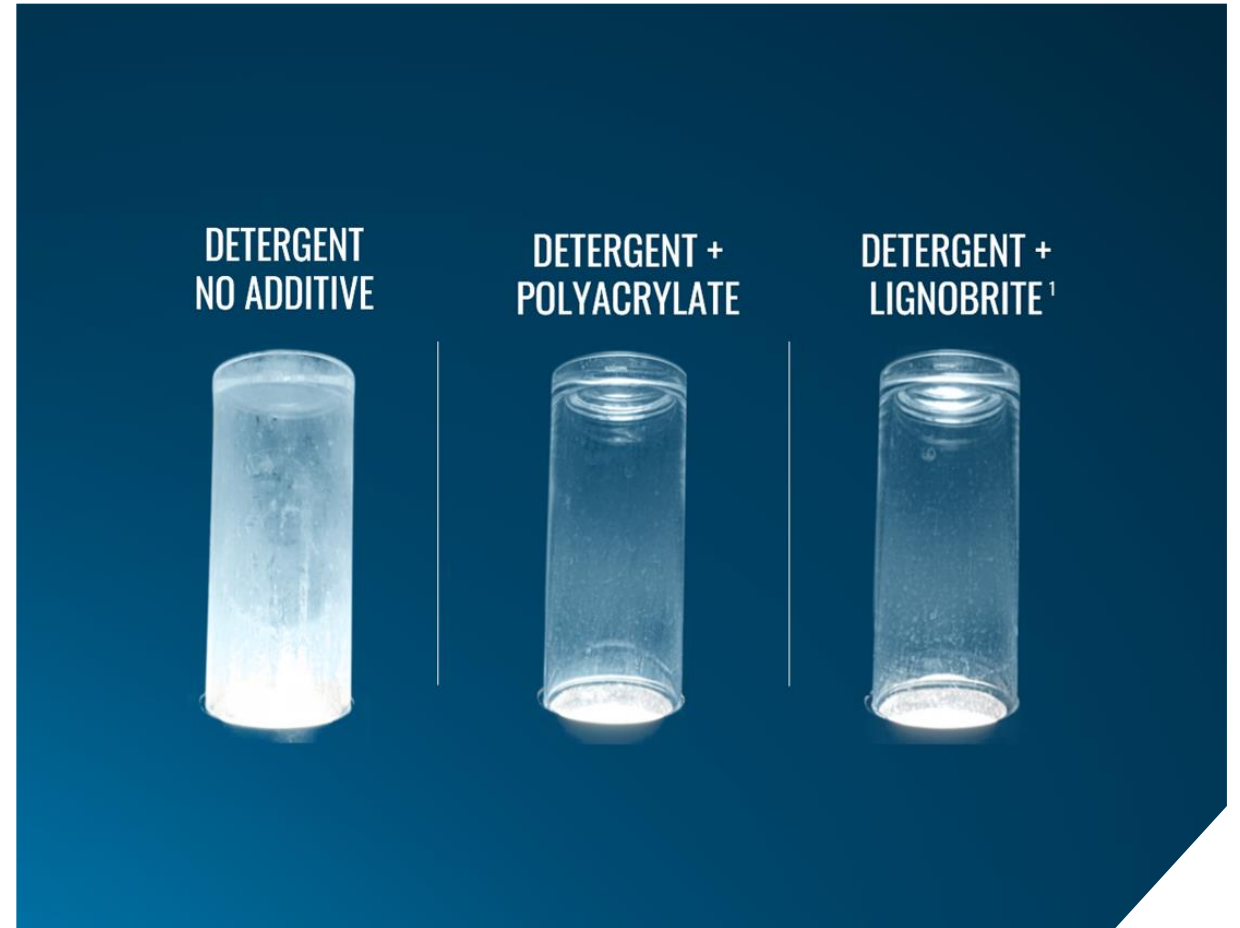
## Effect

Less film on glass, plastic and ceramic

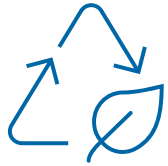


## Customer value

Excellent replacement for polyacrylate  
Effective and sustainable anti-filming agent in auto dishwasher detergents



# New green technology: Entering the coatings market | BioSolutions



## Sustainable alternative

Novel bio-based high-performance dispersant for coatings



## Effect

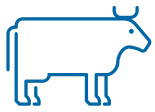
Improved dispersion of pigments  
Better scrub resistance and hiding power  
No colour variation



## Customer value

Enables replacement of advanced fossil-based dispersants in coatings  
Product launch in 2024





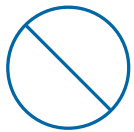
## Multitude of applications

Borregaard's products used as pelleting aids, emulsion stabilisers, bypass protein, acidifiers



## Trends

Increasing demand for high-quality and sustainable products  
CAGR 2–3% for animal-based food



## Regulated market

Compliance and certifications required to serve the market



## Customer value

Improved productivity and product quality, bio-based, no animal origin, non-GMO, safe to use, global availability



# Animal feed: Regulatory driving change | BioSolutions

## PELLETING AIDS



### Benefits

Better pellet consistency and durability  
Improved production rates  
Decreased energy consumption



### Regulatory

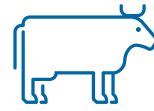
Borregaard's lignin re-authorized for use in animal feed within EU – February 2024



### Outlook

Consumption of meat per capita expected to increase towards 2030  
Strong trends towards bio-based and efficient products

## BYPASS PROTEIN



### Benefits

Feed protein content is key in milk production  
Bypass technologies prevent loss of protein  
Borregaard offers cost-efficient and sustainable solutions



### Regulatory

Formaldehyde ban in dairy production within EU



### Outlook

Modest growth for dairy products in coming years  
Expect other regions to follow EU's formaldehyde ban, will offer opportunities to Borregaard

# Animal feed: New feed binder for the aqua culture industry | BioSolutions



## Background

90% of shrimp feed contain binders  
Dominating synthetic binders (urea formaldehyde) will be banned  
Strong demand for non-synthetic sustainable binders



## Effect

New binder formulation developed and tested by customer  
Similar performance as synthetic binders  
New binder formulation patented (pending)









## Outlook

Currently in the scale-up stage  
Product launched in 2024  
First commercial sale in 2025



# Borregaard – the only producer of wood-based vanillin | BioSolutions

	Vanilla beans	Plant-based vanillin				Oil-based & 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 | BioSolutions

## 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



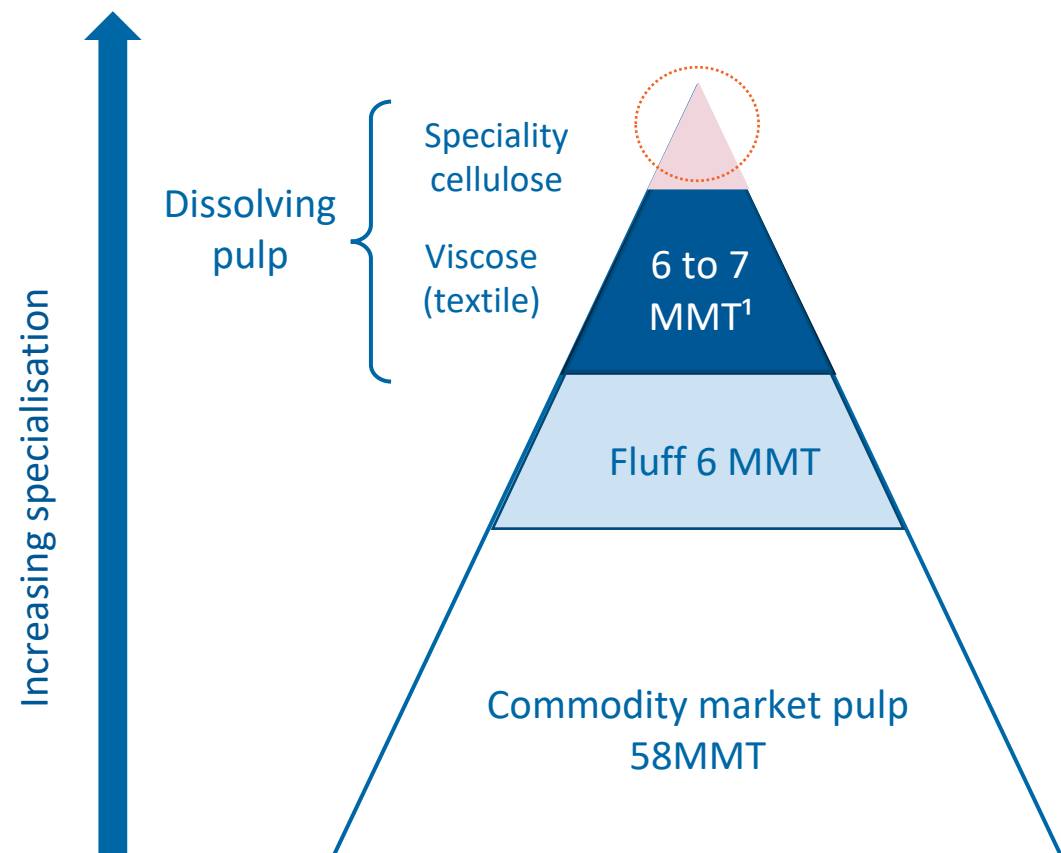
## Anti-dumping investigations chinese vanillin

- Both in EU<sup>1</sup> and the US<sup>2</sup>, anti-dumping investigations have been initiated for all grades of vanillin produced in China
- May lead to a positive price and demand impact for biovanillin from Borregaard, depending on the outcome and timeline of the investigations

<sup>1</sup> <https://eur-lex.europa.eu/eli/C/2024/3241>

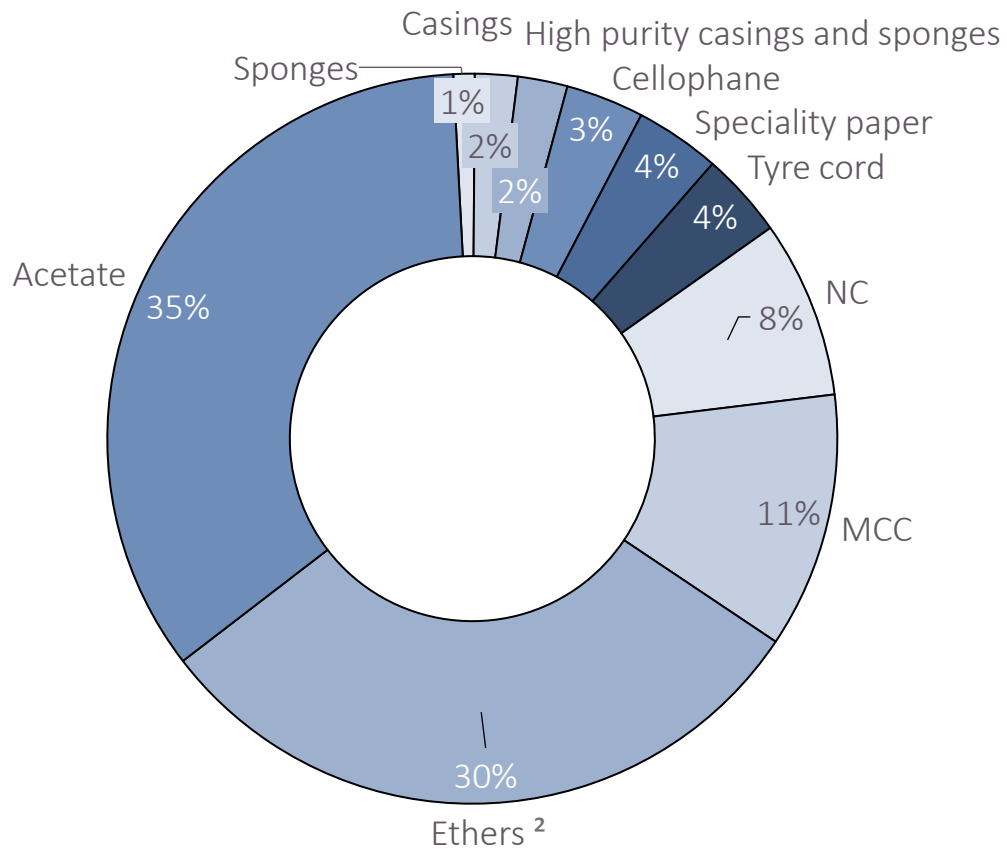
<sup>2</sup> <https://www.trade.gov/initiation-ad-and-cvd-investigations-vanillin-china>

# The global speciality cellulose market | BioMaterials



# Market overview and Borregaard focus areas | BioMaterials

Speciality cellulose demand ≈1.6 million mt<sup>1</sup>



Target segments in highly specialised applications

Segments	Applications	CAGR 2024-2027
Acetate	Cigarette filters, plastics, LCD, yarn	0–2%
Ethers	Construction, coatings, food, pharma, personal care	3–4%
Tyre cord	High-performance tyre cords	2–3%
High purity casings and sponges	Sausage casings, sponge cloths	0–1%

## Borregaard focus areas

- Growth in non-filter tow applications in acetate
- Regulated segments in ethers
- Entering high-purity casings

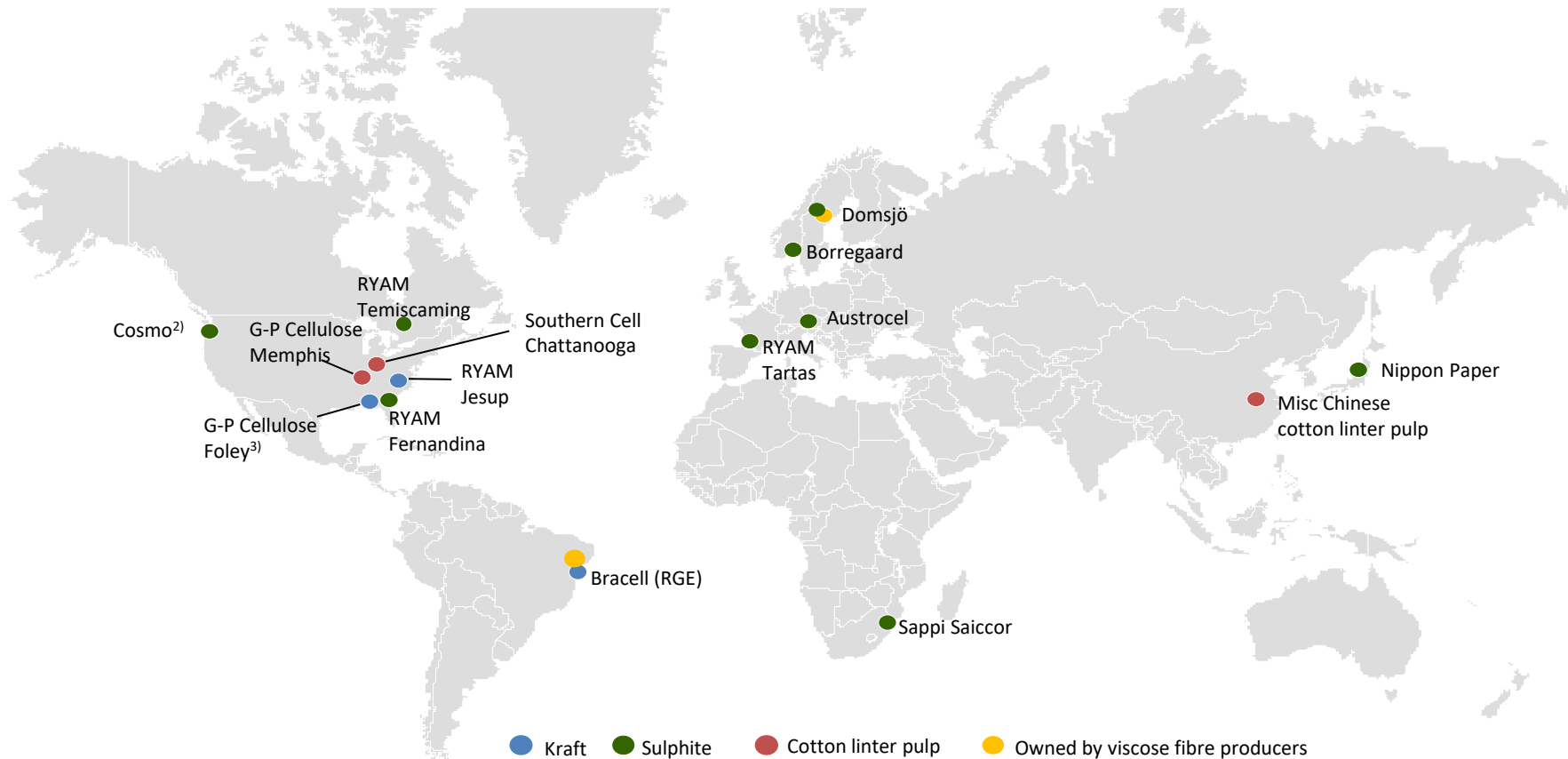
Source: Celco market reports, RISI and Borregaard estimates

<sup>1</sup> Metric tonne

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

# Speciality cellulose suppliers | BioMaterials

- 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

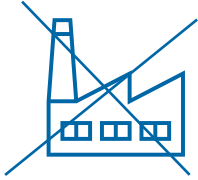


1 Source: Celco market reports and Borregaard estimates

2 Currently idle, start up date unknown

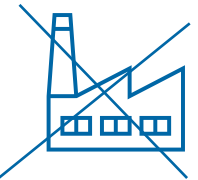
3 Press release September 18, 2023: Georgia-Pacific announces plan to permanently close the facility

# Recent announcements of speciality cellulose plant closures | BioMaterials



## September 2023:

Georgia-Pacific to close Foley cellulose facility<sup>2</sup>

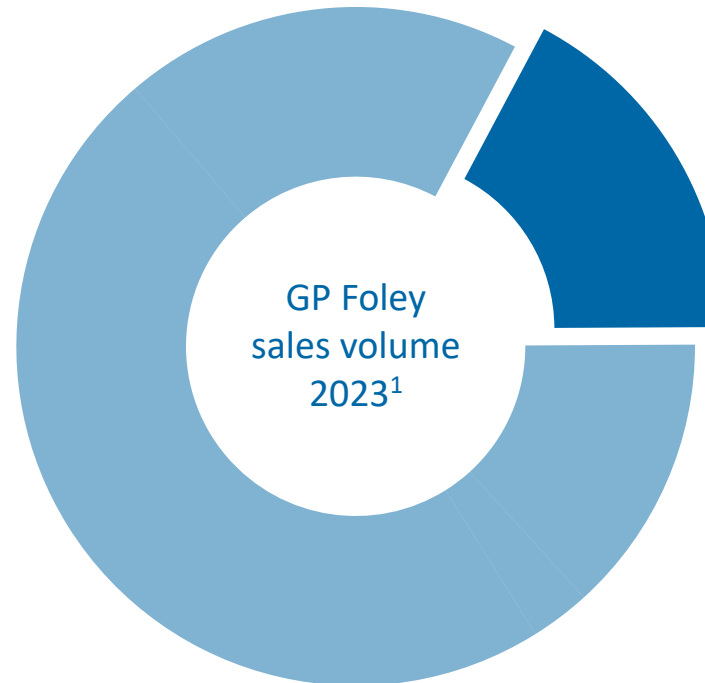


## April 2024:

RYAM to suspend Temiscaming High Purity Cellulose plant operations for an indefinite period<sup>3</sup>

- Significant supply of softwood speciality cellulose removed from the market
- Some customers are using cotton linter pulp (CLP) to counter the effect of these plant closures

## Expected volume effects of GP Foley closure



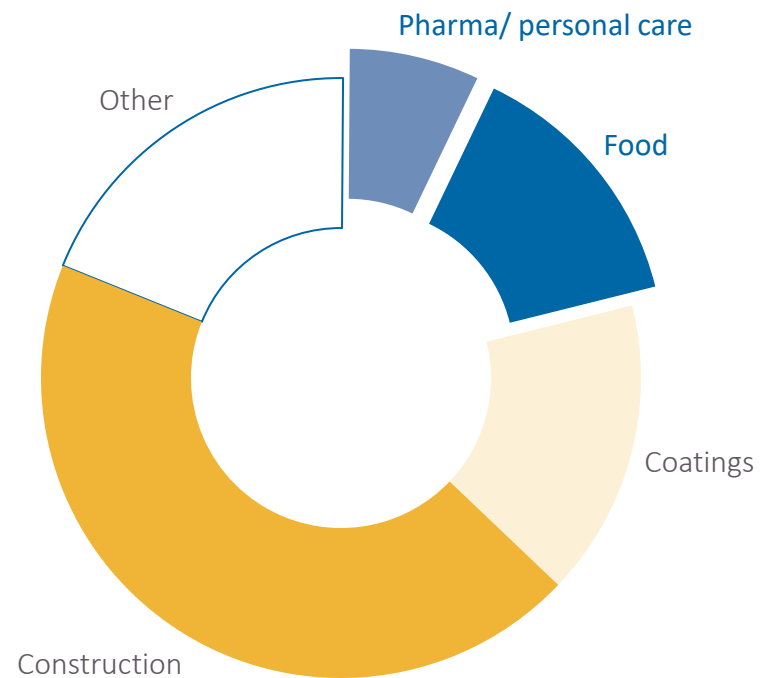
Borregaard potential:  
15,000 – 20,000 mt,  
primarily within  
high-purity grades

<sup>1</sup> Borregaard estimates

<sup>2</sup> Georgia-Pacific to close Foley cellulose facility

<sup>3</sup> RYAM to suspend Temiscaming High Purity Cellulose plant operations for an indefinite period

Cellulose ether market by application

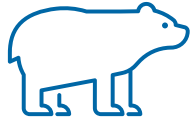


## Borregaard's ether strategy

Focus on regulated applications like food, pharma and personal care

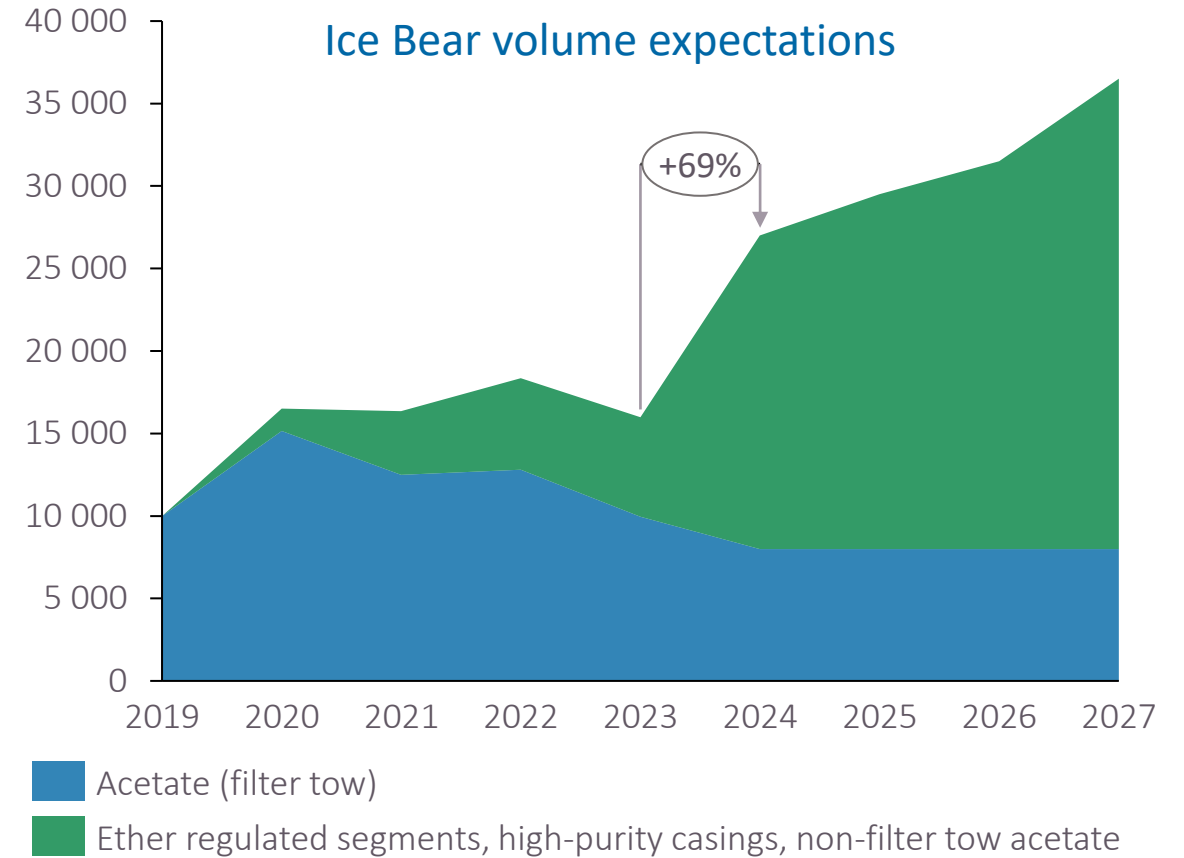
- Substantial growth expected in the 2024–2027 period
- High viscosity industrial applications (such as paints and car catalyst applications) with barriers to entry will remain a profitable and growing focus area
- Gradual reduction of share within industrial applications by reducing exposure to low-value grades in construction

# Ice Bear technology: Driving high-value product portfolio | BioMaterials



## Market and ambitions for Ice Bear

- Enabler for ambitions within ether regulated applications
- Rapid growth in high-purity casings after GP's Foley closure
- Significant market share growth within non-filter tow
  - Acetate producers developing products within non-filter tow
- Ramp-up of Ice Bear production based on market demand



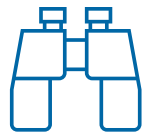
# Ice Bear in bio-based plastics | BioMaterials

## Challenges

- Significantly higher price vs. fossil-based plastics
- Technical requirement of bio-based plastics

## Current status

- Implementation of microplastic regulations
- Substantial rise in demand for biodegradable plastics
- More than 10,000 tonnes Ice Bear contracted for 2024



Long-term potential of 50,000 tonnes



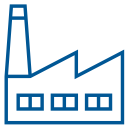


# Cellulose fibrils | BioMaterials



## Global leader in micro-/nanofibrils

- More than 30 application areas from pharma to concrete
- Competitors in pilot plant or captive use phase
- Embryonic but fast-growing market



## Large scale plant with 1000 tonnes dry capacity

- Growing customer base
- Zero emissions



## Network of micro and nano fibrils with large surface area

- Cellulose fibers defibrillated into millions of tiny fibrils (100,000 times thinner than hair)
- 1 gram covers a tennis court



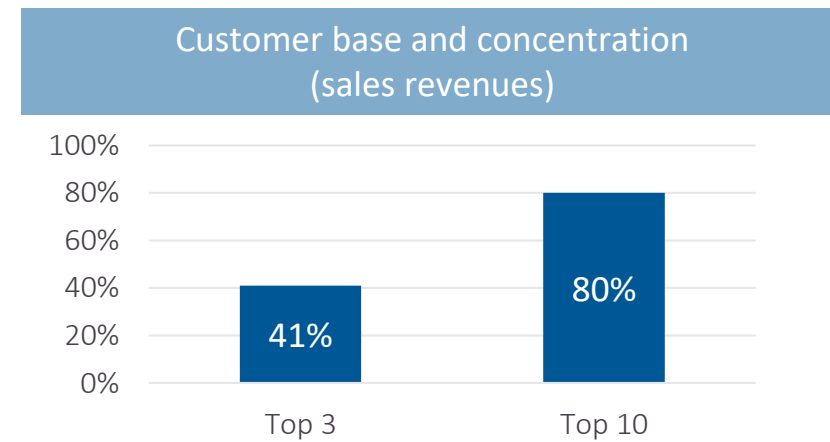
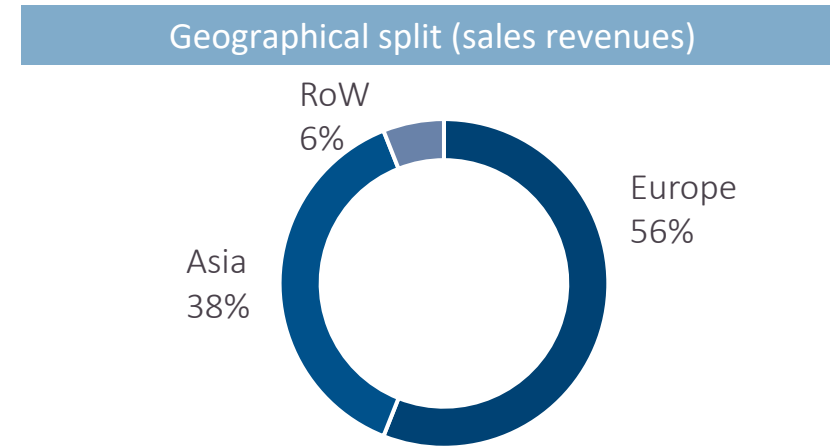
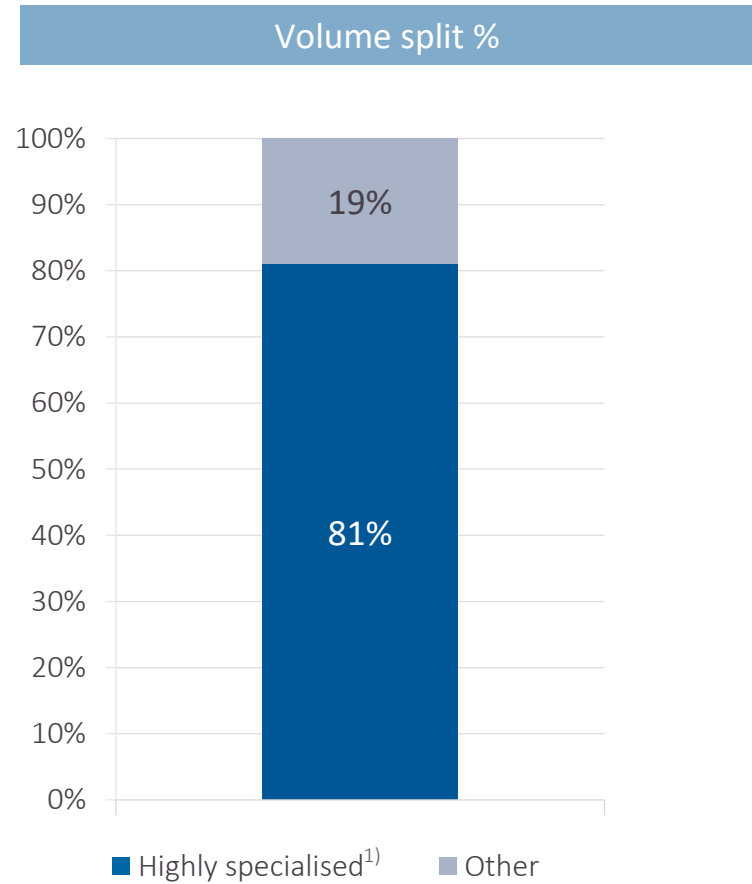
## Key benefits

- Improves flow, stability, flexibility and strength in industrial formulations and materials



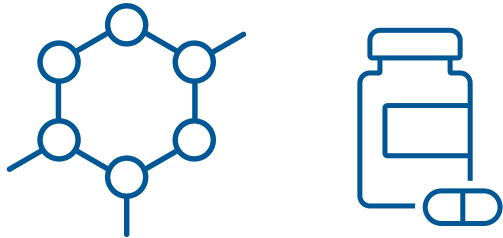
# Sales distribution 2023 | BioMaterials

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



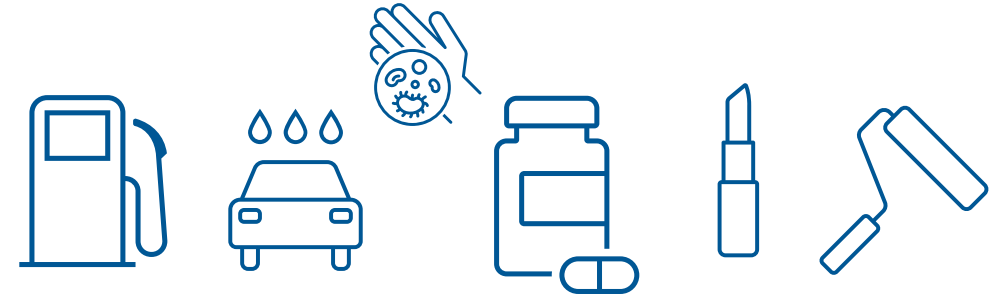
Source: Borregaard estimates  
1 Acetate, ether and tire cord grades

# Fine Chemicals in Borregaard | Fine Chemicals



## Fine chemical intermediates

- Leading producer of intermediates for contrast agents
- Production of C3 aminodiols and intermediates for pharmaceutical products in Sarpsborg, Norway
- Applications: Contrast agents for medical imaging and medicines
- 5–7% market growth



## Bioethanol

- Leading producer of advanced 2G bioethanol
- Favourable climate footprint
- Production of pure and denatured bioethanol in Sarpsborg, Norway
- Applications: Biofuel, disinfectant, pharmaceutical industry, home and personal care products, paint/varnish, car care
- Capacity of 20 million liters

## 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
  - Issuer rating of A-/Stable from Scope ratings affirmed in April 2024

## 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

# Capital allocation priorities | Financials



## Expansion investments

Increased specialisation and capacity



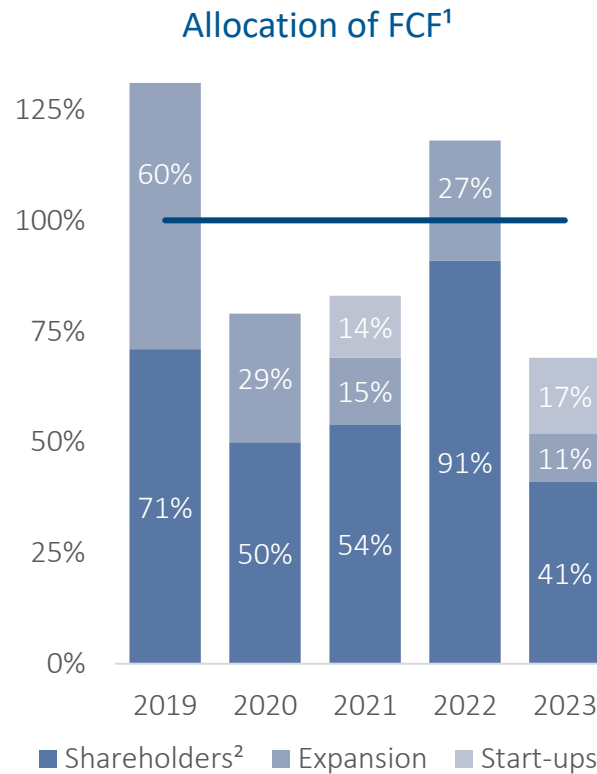
## Acquisitions and other investments

Bio-based start-ups and complementary value-adding businesses



## Shareholders

Dividends and net buy-backs



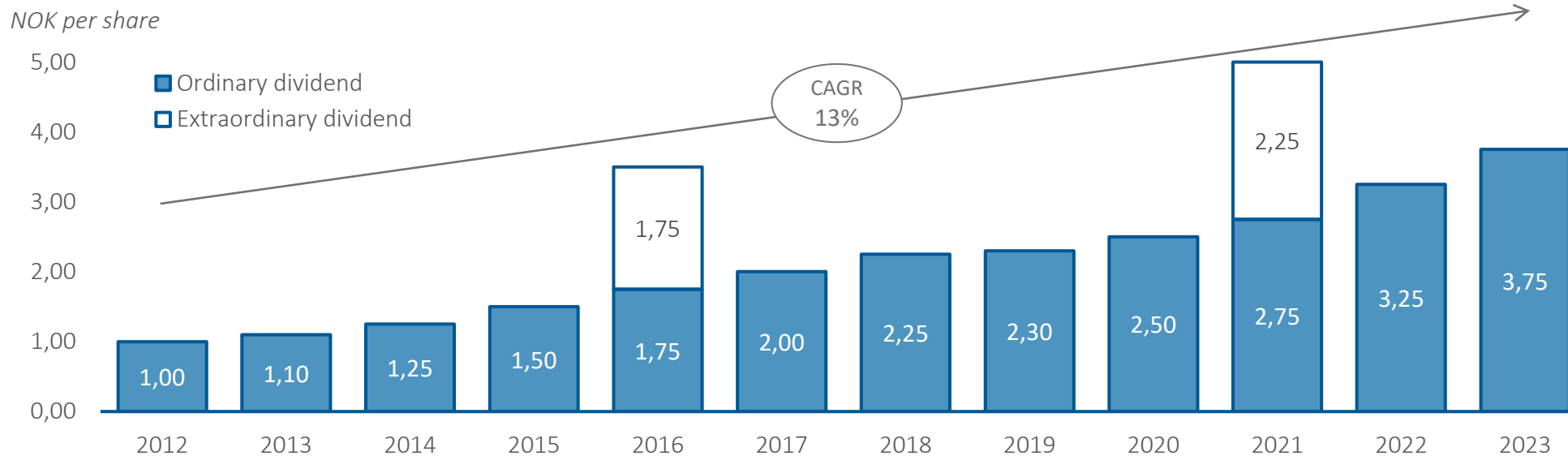
Priorities will be set in line with financial targets and dividend policy

- ROCE above 15% pre-tax over a business cycle
- Leverage ratio well within targeted level (1.0–2.25)
- Regular and progressive dividends

<sup>1</sup> FCF: Free cash flow defined as cash flow from operating and investing activities, excluding expansion investments

<sup>2</sup> Shareholders: Proposed dividends and net buy-back of treasury shares

# Progressive dividends over time | Financials



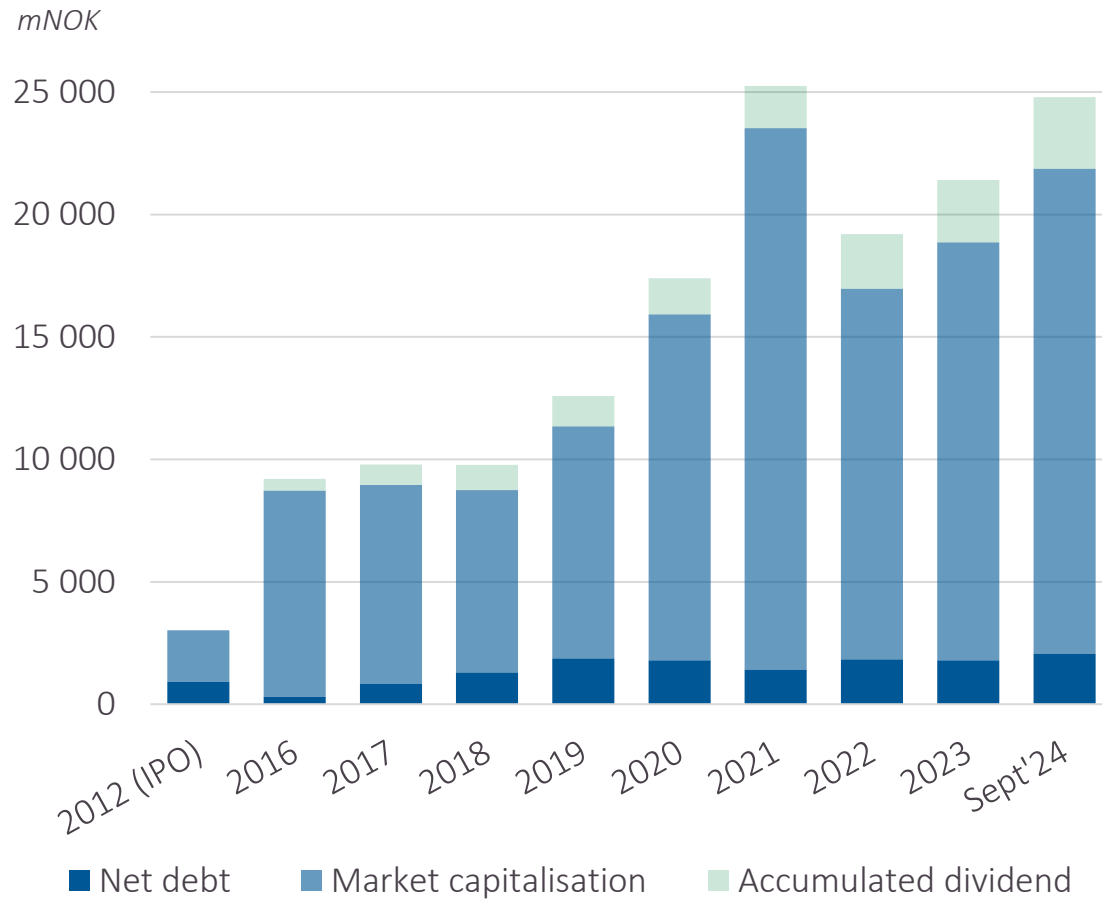
## Borregaard's dividend policy

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

## Dividend reflects improved profitability and cash flow over time

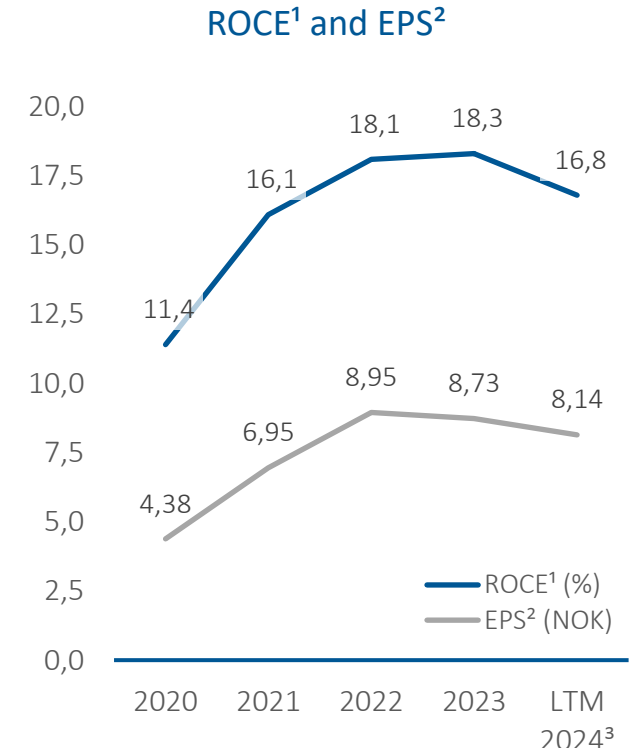
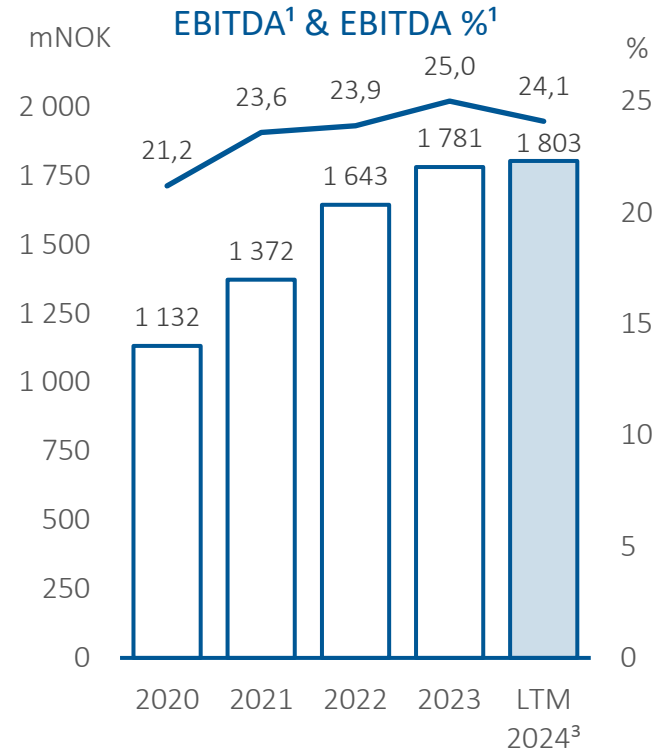
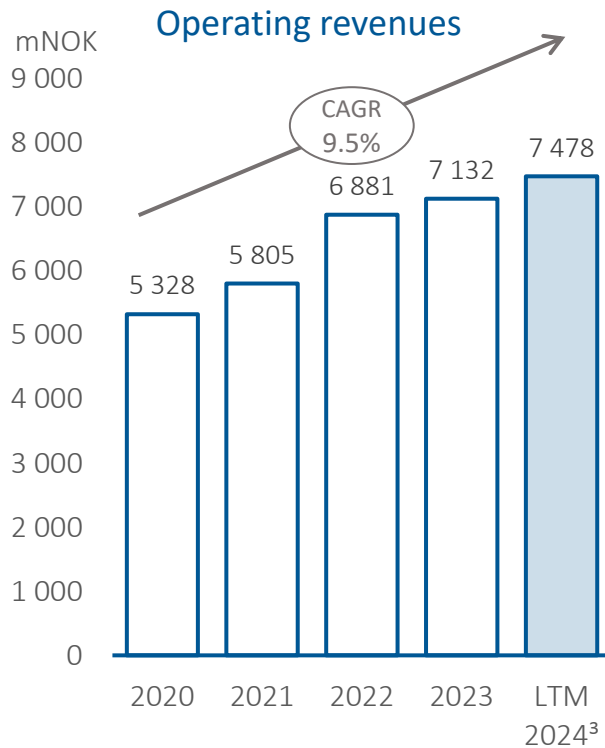
- Ordinary dividend for 2023 close to four times higher than 2012 (IPO)
- Extraordinary dividend for 2016 and 2021
  - Strong earnings, cash flow, leverage ratio and outlook

# Value creation since IPO | Financials



	CAGR
Share price, including reinvestment of dividend	24.0%
Enterprise value = market cap + net debt	18.0%

# Improved performance during a period with uncertainty | Financials



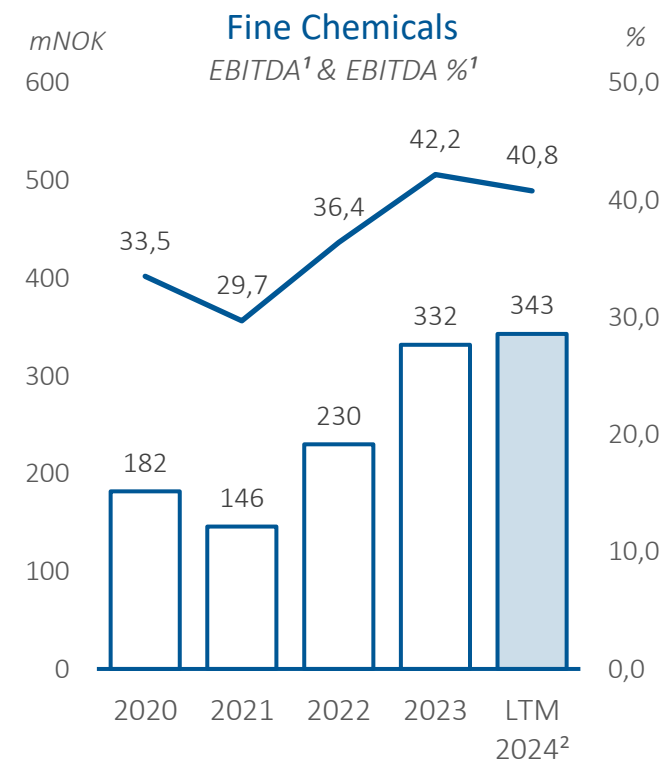
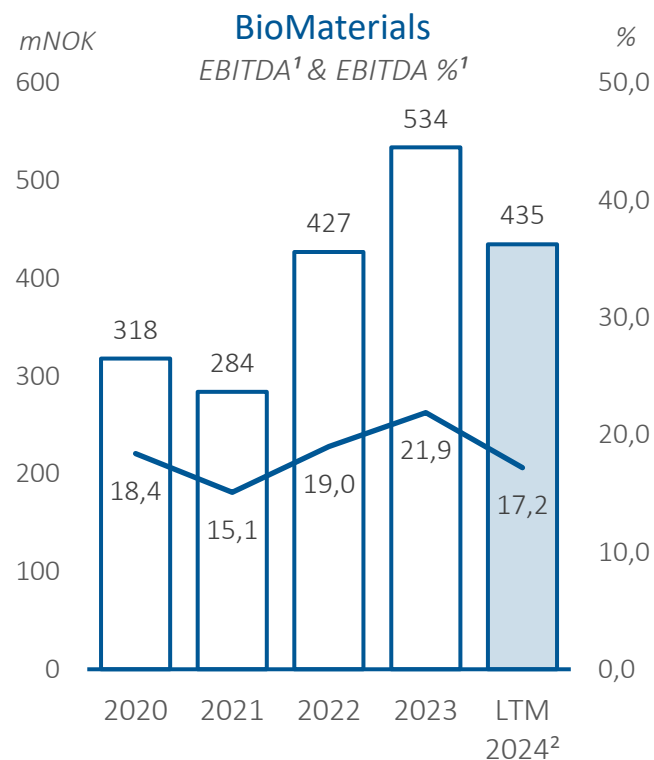
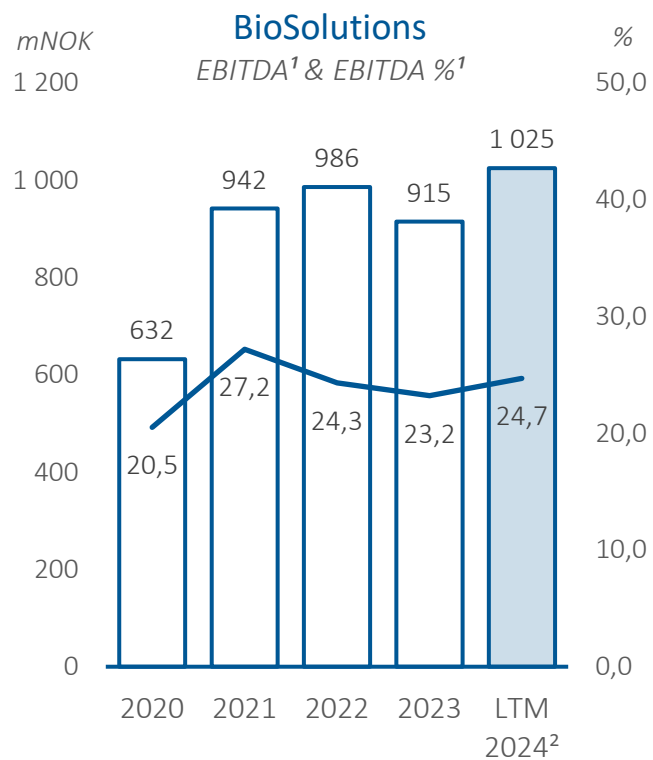
1 Alternative performance measures – see Appendix

2 Earnings per share

3 Last twelve months as per September 2024



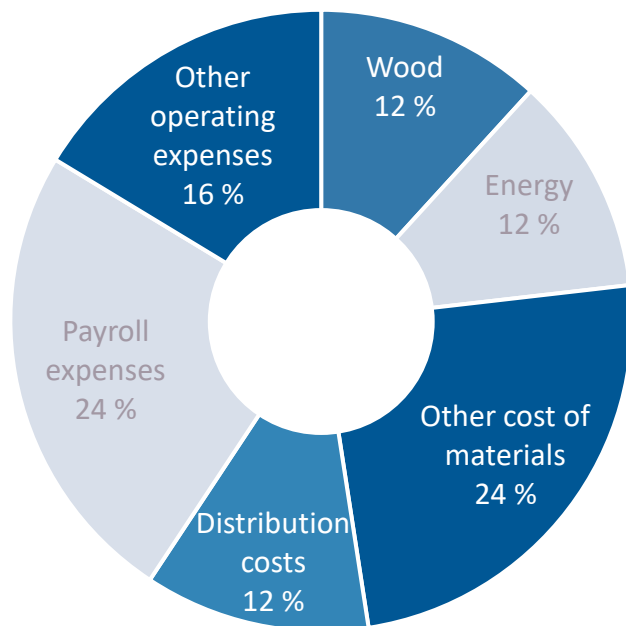
# Solid results in all business segments | Financials



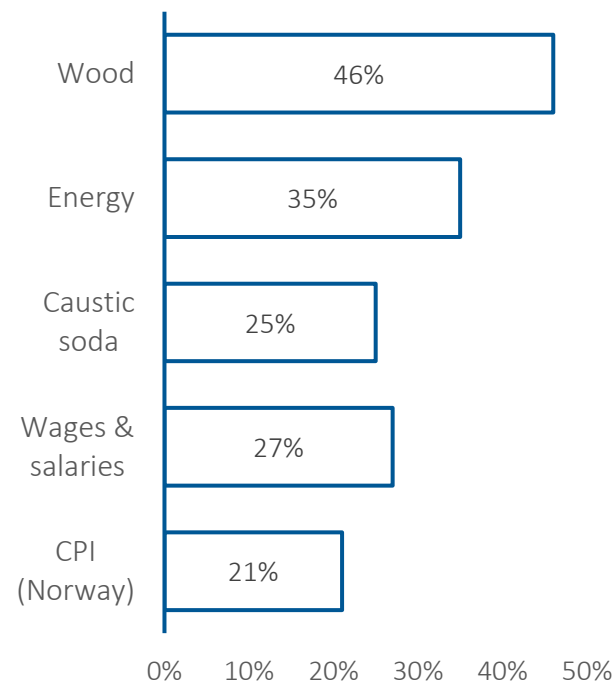
1 Alternative performance measures – see Appendix  
 2 Last twelve months as per September 2024

# Significant cost increases have been mitigated | Financials

## Share of operating expenses 2023



## Cost increases 2019 – E2024

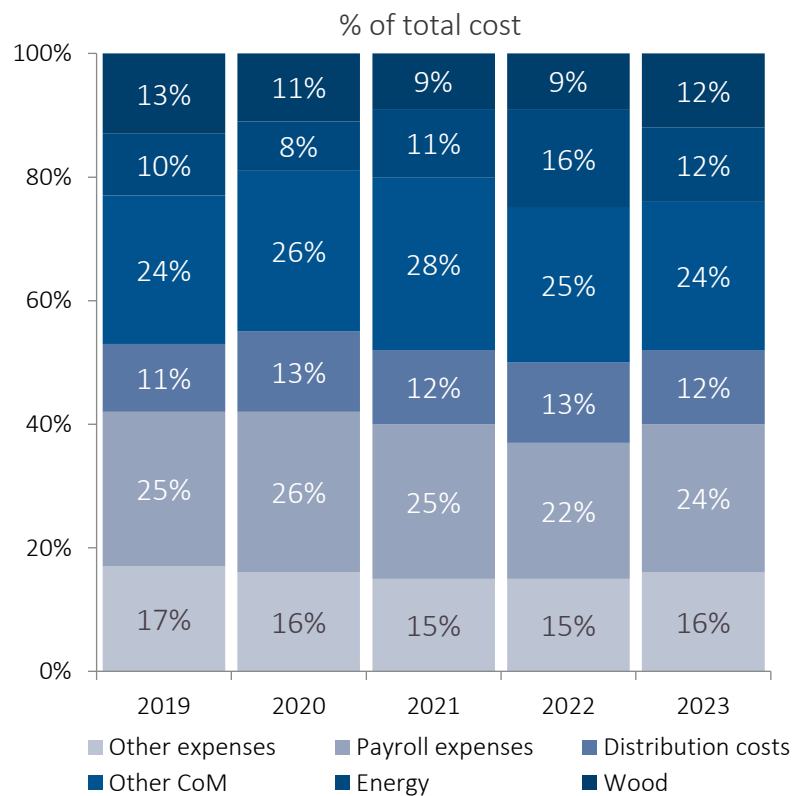


## Significant cost increases over the last five years



- Wood costs impacted by energy prices, a weak NOK (favouring exports) and reduced supply
- Energy costs peaked in 2022, reduced in 2023 and 2024
- Caustic soda impacted by energy prices and weak chlorine market (PVC)
- More specialised work force, tight labour market
- Higher inflation

# Key cost items 2019-2023 | Financials



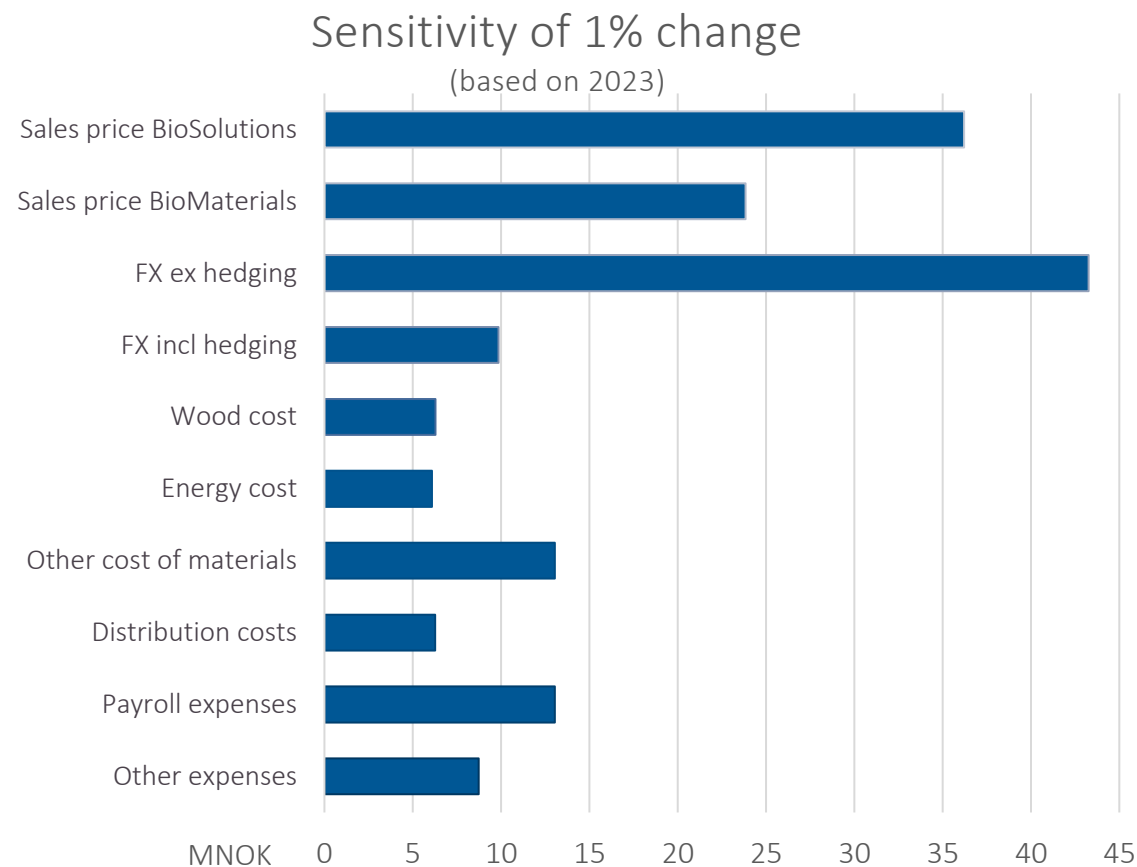
- Total costs in 2023 were 5.4 billion NOK
- 7.2% CAGR from 2019 to 2023
- Main cost components' share of total costs relatively stable over time

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> | Financials

- 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.



<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

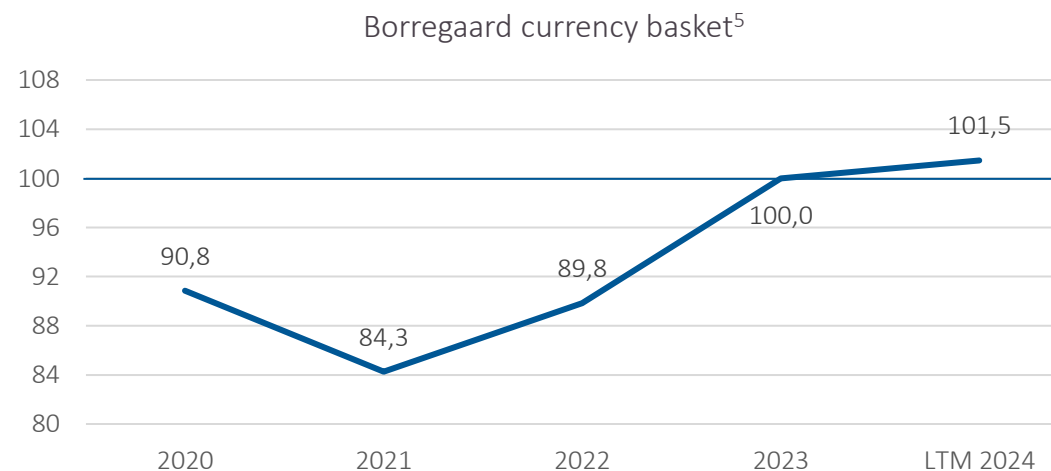
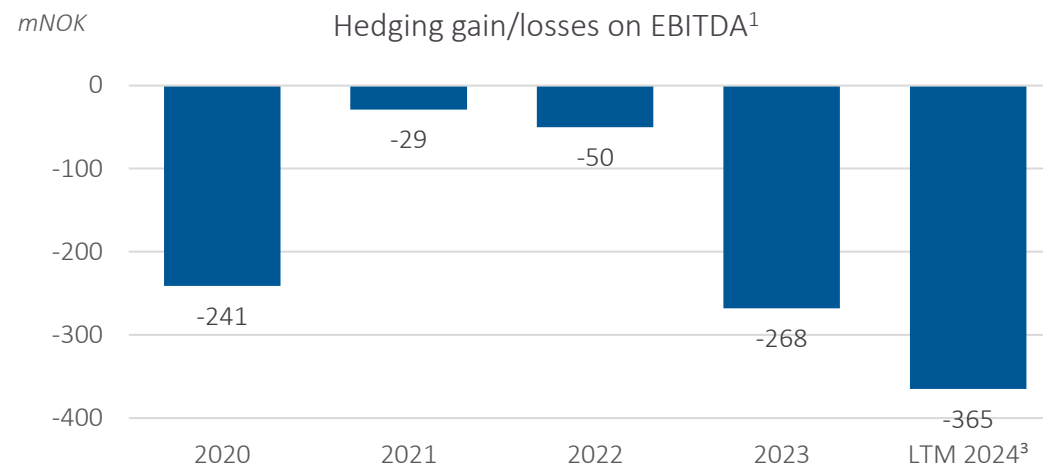
# FX impact and policy | Financials

## 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 10.50 to 11.00
  - USD; gradually increased at effective rates from 9.50 to 10.00
- Contracts<sup>4</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 2023 USD: 60% (approximately 232 mUSD)
- EUR: 42% (approximately 149 mEUR)
- Other: -2% (GBP, BRL, SGD, SEK)



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

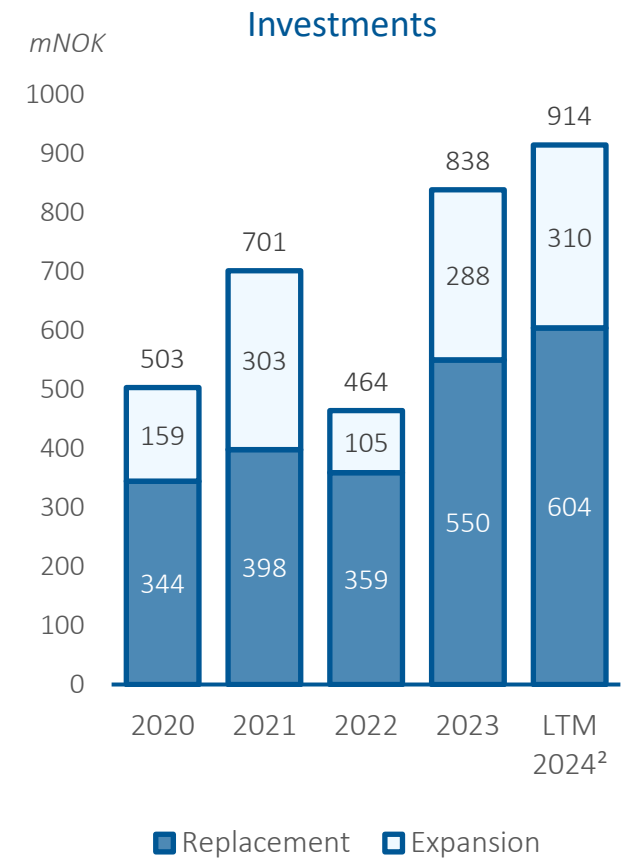
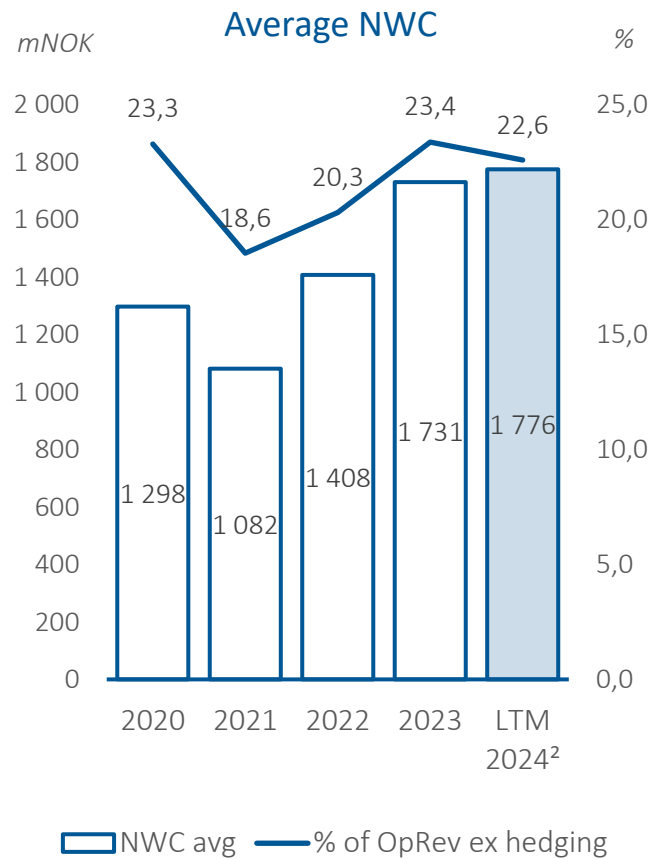
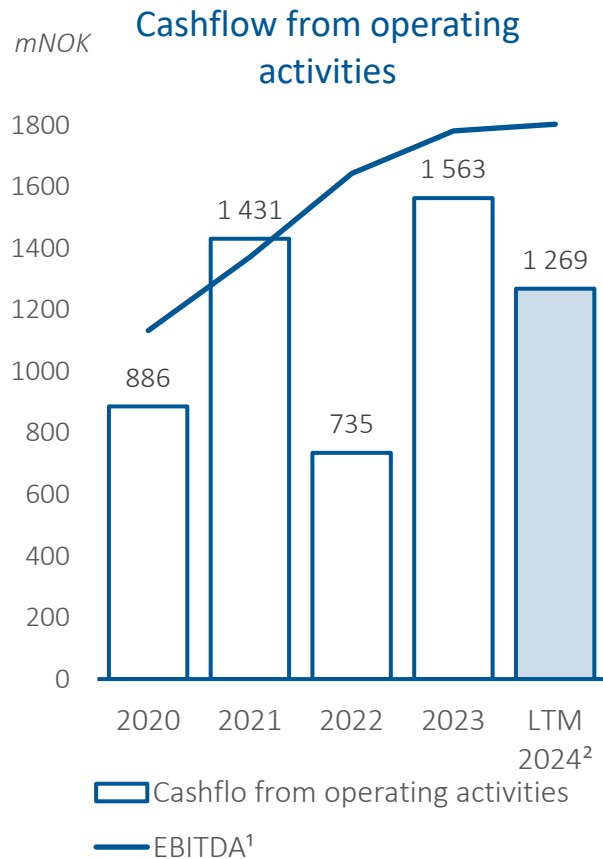
<sup>2</sup> Net cash flow hedging mainly in the Norwegian company

<sup>3</sup> Last twelve months as per September 2024

<sup>4</sup> Strict definitions for contracts applied for 100% hedging (mutually binding agreement in which price, currency, volume and time are defined)

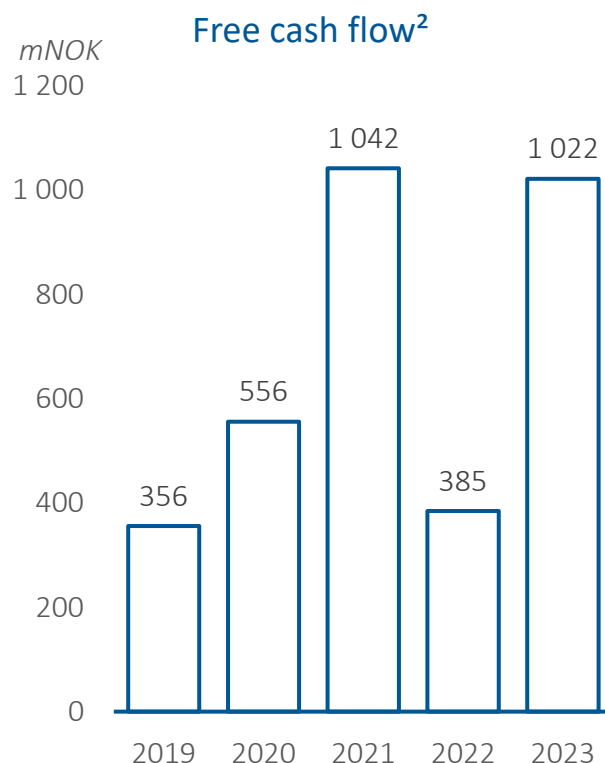
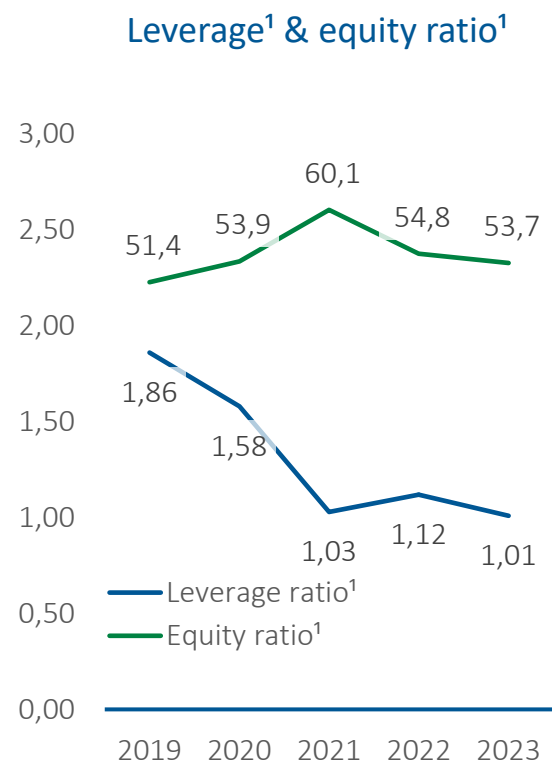
<sup>5</sup> Currency basket based on Borregaard's net exposure in 2023 (=100)

# Cash flow, NWC and investments | Financials



1 Alternative performance measures – see Appendix  
 2 Last twelve months as per September 2024

# Solid financial position and strong cash flow | Financials



## Solid financial position

- Leverage ratio<sup>1</sup> 1.23 and equity ratio<sup>1</sup> 54% (Q2-24)
- Maintain key financial ratios corresponding to an investment grade rated company
- Issuer rating of A-/Stable from Scope ratings
- Leverage ratio target: Between 1.0 and 2.25
- Substantial undrawn credit facilities

## Strong cash generation

- Variations between years, mainly due to changes in net working capital

1 Alternative performance measures – see Appendix

2 Free cash flow defined as cash flow from operating and investing activities, excluding expansion investments

# Investments to reduce CO<sub>2</sub> emissions in line with transition plan | Financials

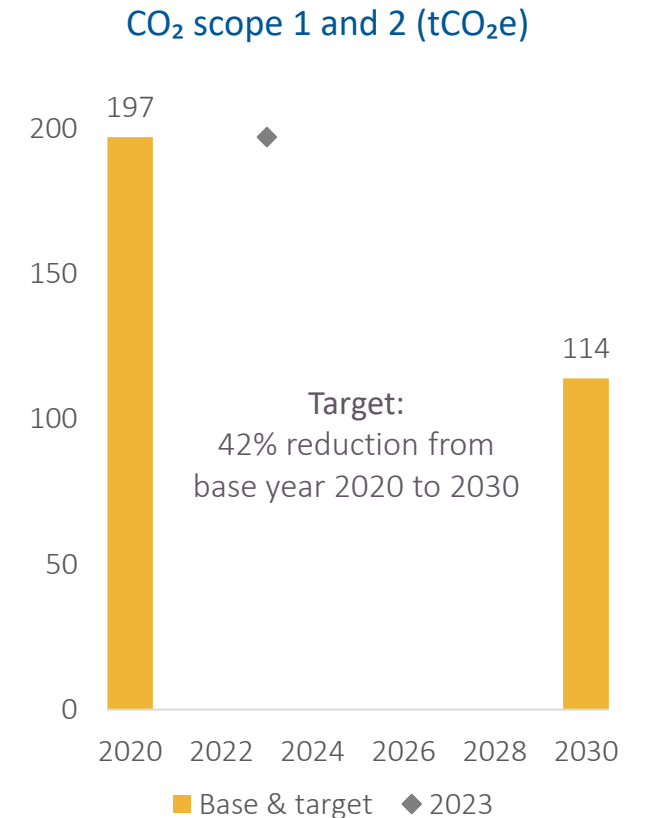
## Completed and on-going investment projects

- Investments forecast to give higher than expected reduction in CO<sub>2</sub> emissions and energy savings
- So far, investment spending below initial transition plan forecast

	Reduced CO <sub>2</sub> (tCO <sub>2</sub> e)	Saved energy (GWh)	Investment (mNOK)	Completed
Increased utilisation of residuals from production processes as bioenergy	10,800	53	90	2022 (2023 impact)
Investment to reduce CO <sub>2</sub> emissions and increase flexibility at the biorefinery in Norway	30,000	40–50	230	Q3 2024, full effect 2025
Investment to upgrade electricity transformation capacity at the biorefinery in Norway	Facilitates CO <sub>2</sub> and energy savings in future projects		275	2028

## Additional projects to reduce CO<sub>2</sub> emissions and COD<sup>1</sup> effluents

- Increase electric boiler capacity for heat energy production
- Produce more biofuel from residuals and process improvements
- Wastewater incineration technology, innovative heat recovery



1 COD: Chemical Oxygen Demand



# Value growth through expansion investments | Financials

## On-going projects in BioSolutions

- Specialisation investment
  - Main target is batteries, also targeting oilfield chemicals, agrochemicals, pigments and dyes
  - Investment 70 mNOK, operational Q4-24
- New green technology platform
  - Commercial scale demonstration plant
  - Investment 100 mNOK, first step operational Q3-24

## Significant impact from earlier expansion investments

- BioSolutions
  - Upgrade of biopolymers facility in Norway, Florida expansion, capacity increase for biovanillin
- BioMaterials and Fine Chemicals
  - Ice Bear project, capacity increase bioethanol, debottlenecking fine chemical intermediates



# Expansion projects 2024 to 2027 | Financials



## Debottlenecking Sarpsborg biorefinery

- Two-step capacity increase
  - Decision first step in Q4-24
- Expected total capacity increase 5–10%
  - Production output expected to increase gradually from H2-26
- Other benefits
  - Reduced costs and volume of residuals
  - Energy savings and reduced caustic soda consumption
  - Reduced COD effluents

## Several smaller and medium sized expansion investments

- Further specialisation of lignin-based biopolymers, including upgrade further specialisation of Wisconsin facility
- Ramp-up of Ice Bear production and further improvement of quality
- Removing capacity restraints in bioethanol and fine chemical intermediates

## Bio-based start-ups

- Support existing investments
- Seek new opportunities

# Investment forecast<sup>1</sup> 2024-2027 | Financials

## Replacement investments

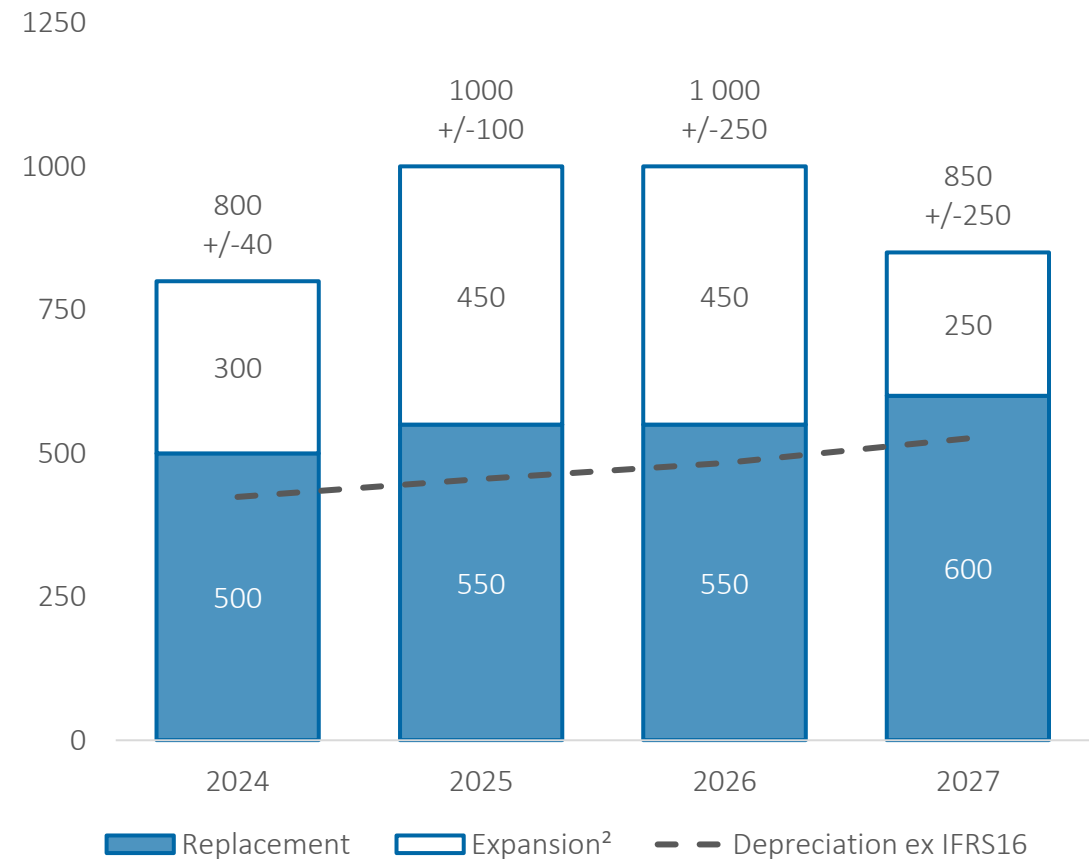
- Targeted CO<sub>2</sub> and COD reductions and general cost increases explain above target level investments
  - Target: Replacement investments at depreciation level
- Supporting specialisation and value growth investments

## Expansion investments<sup>2</sup>

- Increased specialisation
- Debottlenecking at the Sarpsborg site

## New projects may lead to additional investments

- Future investments in bio-based start-ups are not included
  - Share of Alginor's capital raise in 2024 included (150 mNOK)



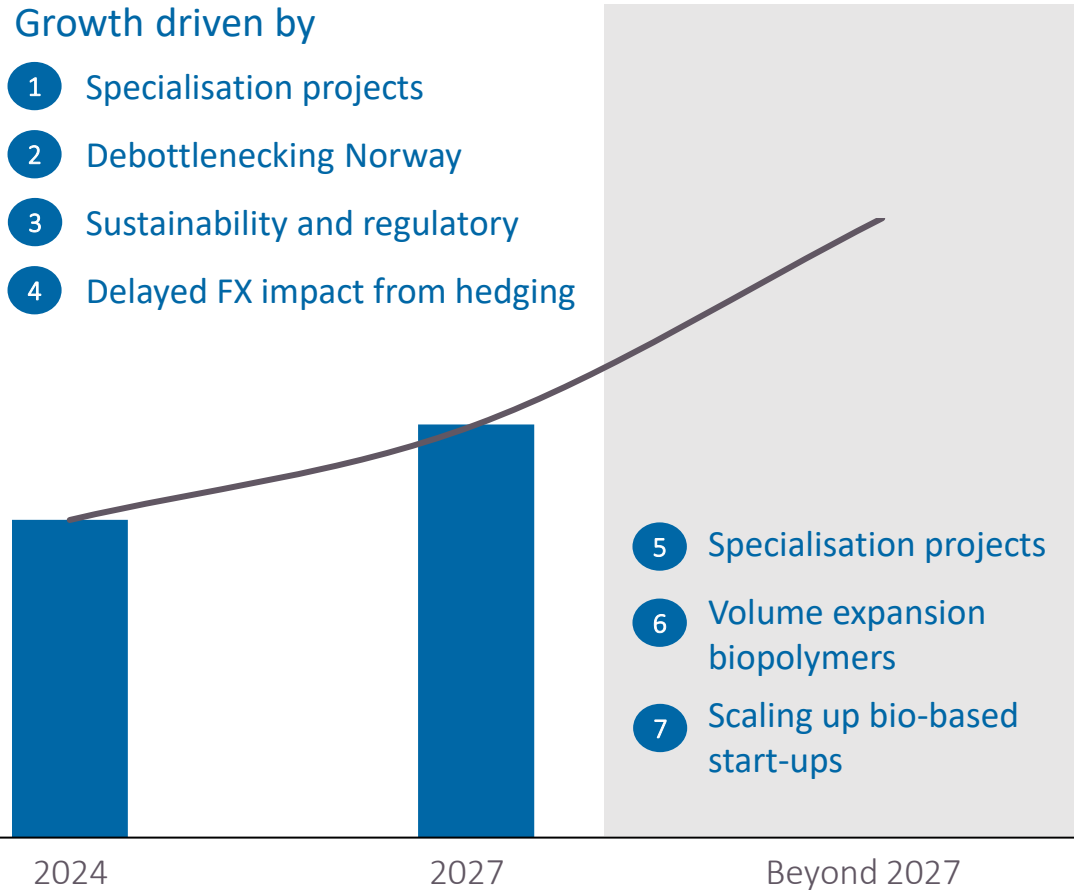
<sup>1</sup> Uncertainty is related to final investment decisions, timing of investment payments, execution time and risk and unexpected events

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

# Borregaard positioned for accelerated growth | Financials

## Growth driven by

- 1 Specialisation projects
- 2 Debottlenecking Norway
- 3 Sustainability and regulatory
- 4 Delayed FX impact from hedging



## Details on growth drivers, applications and effects

- 1 Investments in agri, home care, batteries and Asia strategy in BioSolutions, Ice Bear in BioMaterials
- 2 Debottlenecking Sarpsborg, 5–10% more volume, above IRR target of 15%
- 3 Environmental investments mitigating cost risks, regulatory tailwinds in feed, strengthened sustainability profile
- 4 Significant delayed FX impact from hedging over next three years assuming constant FX rates
- 5 Further specialisation and value growth in BioSolutions, targeting regulated markets in BioMaterials
- 6 Option to grow volumes at Florida plant +50,000 tonnes, alternatively build BALI plant
- 7 Scaling up bio-based start-ups (Alginor, Kaffe Bueno etc), cellulose fibrils expansion

Illustrative figure

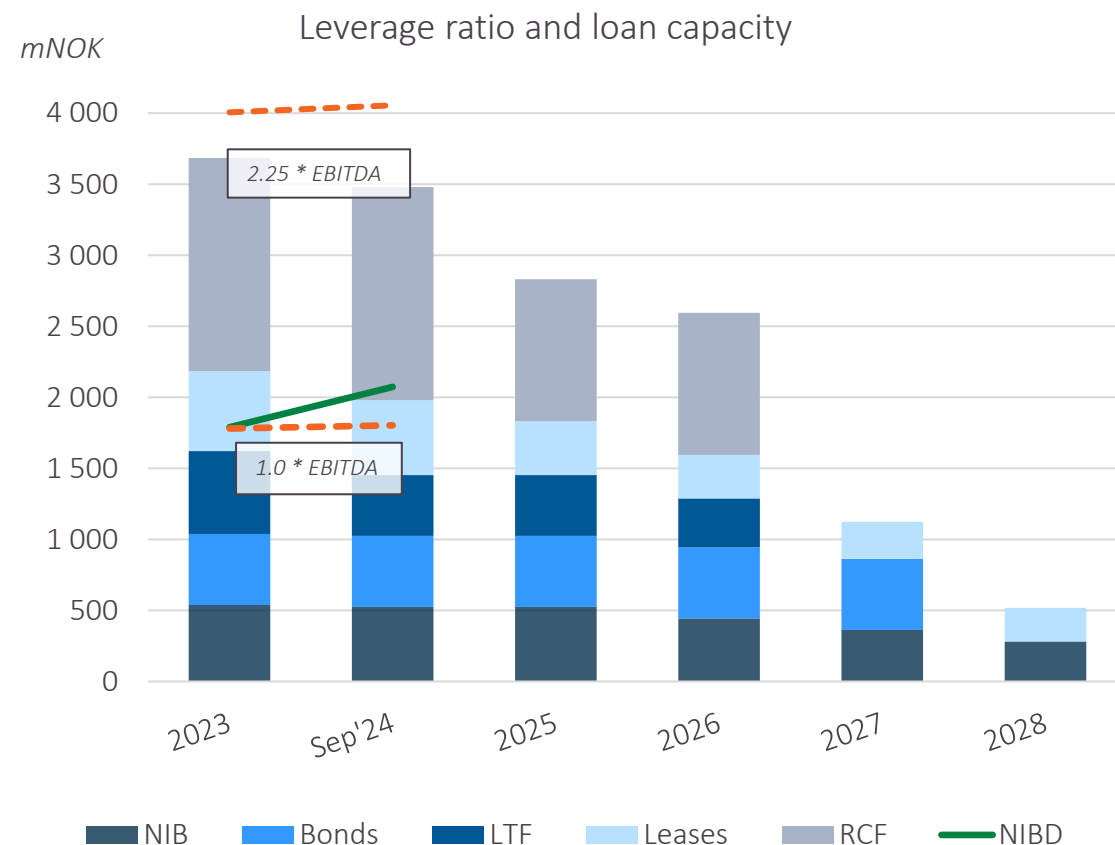
# Capital structure – credit facilities and maturities | Financials

## 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



# Highly experienced and proven management team | Management



**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



**Tom Erik Foss-Jacobsen**

*EVP BioSolutions*

5 years in current position

25 years with Borregaard



**Gisle Løhre Johansen**

*EVP Speciality Cellulose*

*and Fine Chemicals*

5 years in current position

33 years with Borregaard



**Liv Longva**

*SVP Strategic Sourcing*

4 years in current position

16 years with Borregaard



**Kristin Misund**

*SVP R&D and Business*

*development*

5 years in current position

31 years with Borregaard



**Ole Gunnar Jakobsen**

*Plant Director Sarpsborg Site*

16 years in current position

29 years with Borregaard



**Dag Arthur Aasbø**

*SVP Organisation and*

*Public Affairs*

16 years in current position

31 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.