



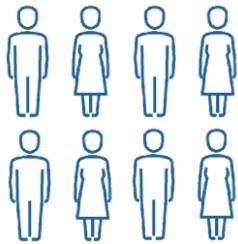
Erfaringer fra utarbeidelse av miljødokumentasjon og markedsmuligheter i Borregaard

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HMS og bærekraftssjef

09.12.2020

Borregaard Group 2019

Antall ansatte



1100

Produksjon



Lignin
Spesialcellulose
Bioetanol
Vanillin
Cellulosefibriller
Finkjemikalier

700

ulike produkter

Råmateriale



1 mill.

fm³ norsk gran

500.000 tonn ligninråvare

Borregaard i verden



Virksomhet i

16

land

Salg til

110

land

Salg utenfor Norge

95

prosent

Omsetning

5,1

milliarder

Res. før avskrivninger

1,0

milliard

Investeringer

583

millioner

Økonomi



Ved bruk av naturlige, bærekraftige råmaterialer og unik kompetanse, produserer Borregaard avanserte og miljøvennlige biokjemikalier og biomaterialer som kan erstatte oljebaserte produkter.

Bærekraft er derfor selve kjernen i vår forretningsmodell

SPESIAL-
CELLULOSE
& CELLULOSE
FIBRILLER
▲ 45% FIBER



BIOPOLYMERER
& BIOVANILLIN

▲ 30% LIGNIN
(BINDEMIDDEL)

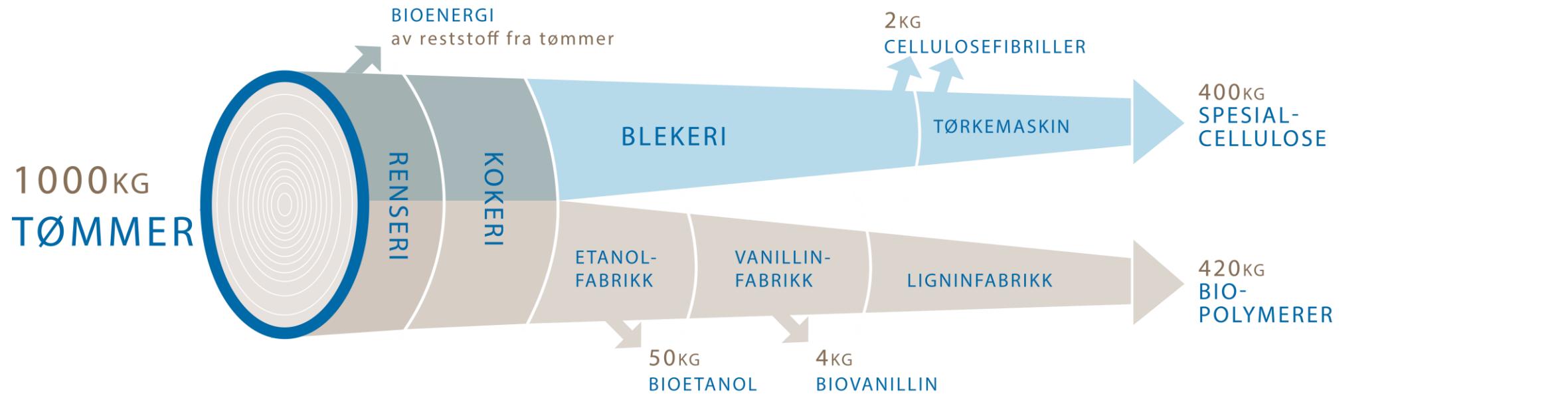
BIOETANOL
▲ 25% SUKKER



Borregaard

!

Høy råvareutnyttelse gir høy verdiskaping



SPESIALCELLULOSE
Bygningsmaterialer
Filter
Trykkfarge og lakk
Pølseskinn
Næringsmidler/Farmasi/Kosmetikk
Tekstiler

BIOPOLYMERER
Betongtilsetning
Dyrefôr
Jordbrukskjemikalier
Batterier
Brikettering
Jordforbedring

BIOVANILLIN
Næringsmidler
Parfyme
Medisiner

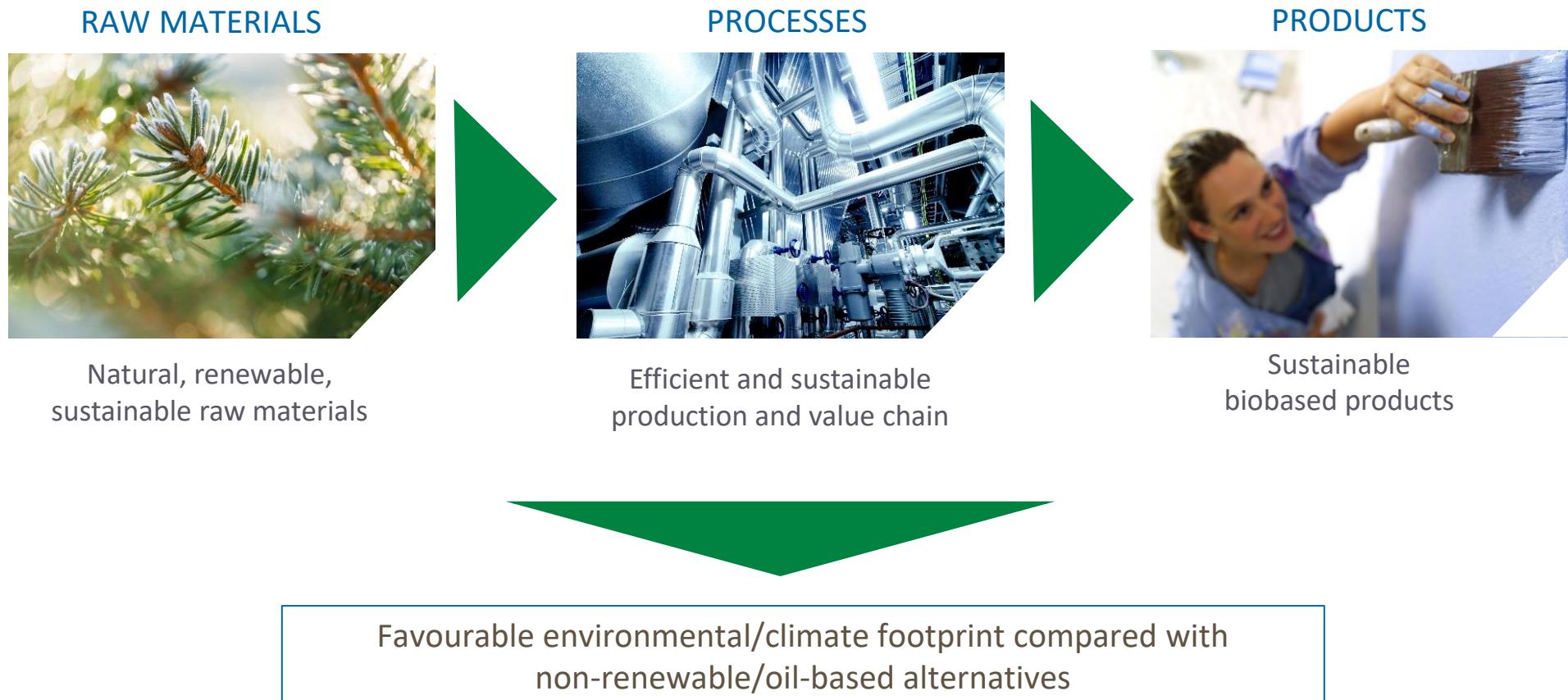
BIOETANOL
Biodrivstoff
Farmasøytsk industri
Maling og lakk
Bilpleiemidler

CELLULOSEFIBRILLER
Lim
Maling og lakk
Jordbrukskjemikalier
Kosmetikk
Rengjøringsmidler
Bygningsmaterialer



Borregaard

DOCUMENTED SUSTAINABILITY PERFORMANCE: LCA¹⁾ APPROACH



SUSTAINABLE SOURCING OF WOOD RAW MATERIALS

RAW MATERIALS



Sustainable and certified wood

- Documentation
- PEFC¹⁾ and FSC¹⁾ standards
- Lignin raw materials from certified and controlled forests

FOREST AS CLIMATE ACTION

UN Special Report on Climate Change and Land



Carbon storage:
Plant more trees

Biodiversity:
Forest restoration

Fossil carbon alternative:
Wood-based products

Prerequisite in certification schemes

IMPROVED ENVIRONMENTAL FOOTPRINT FROM PROCESSES

PROCESSES



SCIENCE BASED TARGETS



Improved environmental footprint

- CO₂-reductions, CDP A rating
- Reduced emissions to water and air
- “Greener” logistical solutions

Targeted reductions approved by CDP¹⁾(base year 2009):

- 53% by 2030
- 100% by 2050

CO₂ reductions 2009-2019: 35-40%

Plans for further reductions (2030)

- Increased use of bio energy
- Increased use of electricity for steam production
- Energy conservation

PRODUCTS WITH MULTIPLE SUSTAINABILITY FEATURES

PRODUCTS



Favourable CO₂ footprint

GHG emissions



Natural, renewable raw material



Improved EHS performance



Borregaard

MILJØDOKUMENTASJON

- Renere produksjon-prosjekter for vanillin i 1992 og 1996
- Klimaanalyse av hele bioraffineriet i 2008
- LCA og fire Miljødeklarasjoner(EPD) i 2009/2010
- EPDer også for to etanoltyper i 2011
- Oppdatering av LCA og seks EPDer i 2015/2016
- Exilva-prosjektet 2016-2020 (Horizon 2020)
- GHG Protocol Scope 3: 2016, 2017, 2018 og 2019

- **Pågår:**

- Ny oppdatering av LCA og EPDer i 2020/21
- LCA og EPDer for lignin fra fabrikken i Florida i 2021
- GHG Protocol Scope 3 2020



SUSTAINABILITY - COMPETITIVE EDGE

Capitalise on Borregaard's biorefinery model and biobased solutions

- Replace fossil raw materials
- Documented favourable environmental footprint
 - Wood-based biopolymers
 - 2nd generation feedstock
- LCA - Life Cycle Analysis
- EPD - Environmental Product Declarations



SUSTAINABILITY - COMPETITIVE EDGE IN USE

Plant nutrition – favourable environmental footprint

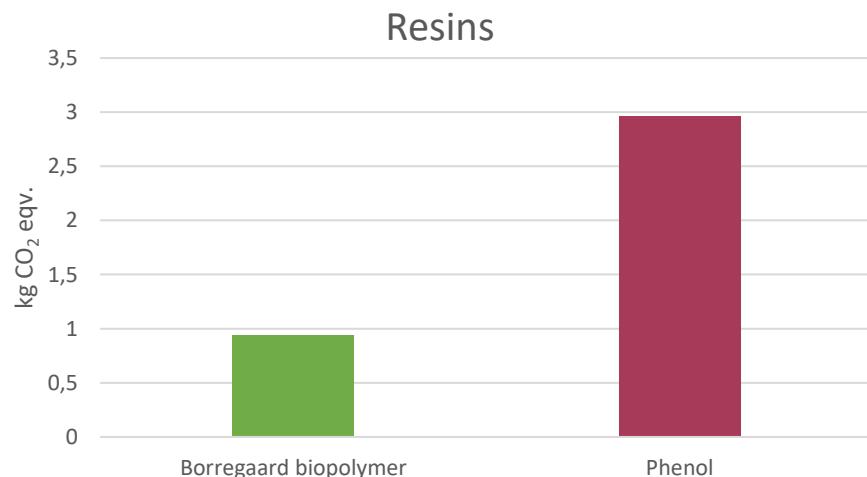
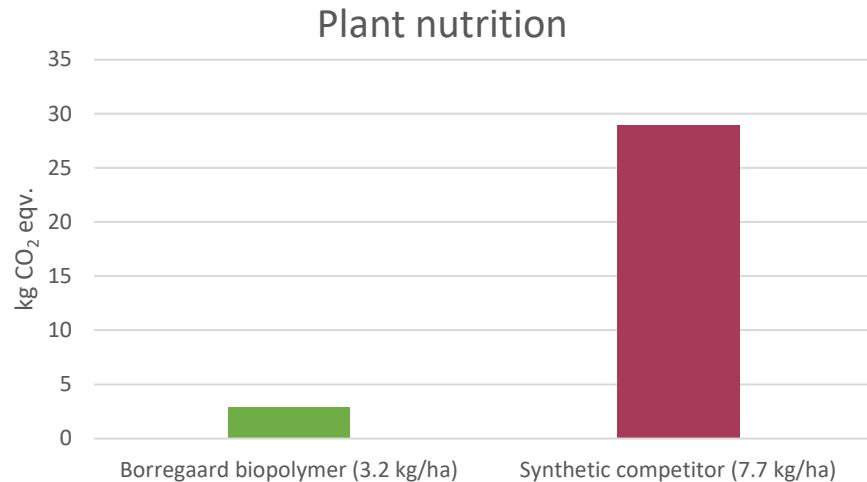
- Borregaard's biopolymers - the sustainable alternative to synthetics for formulating micronutrients
- High efficiency, lower dosage
- 90% reduction in CO₂ emissions compared to synthetics

Resins – sustainable replacement for petrochemicals

- Significantly increases the renewable content in resins
- >65 % reduction CO₂ emissions per feedstock unit

Animal feed additives – alternative to antibiotics

- Alternative to antibiotic growth promotors
- Less corrosive and safer to handle than organic acids in pure form
- Patented SoftAcid® technology



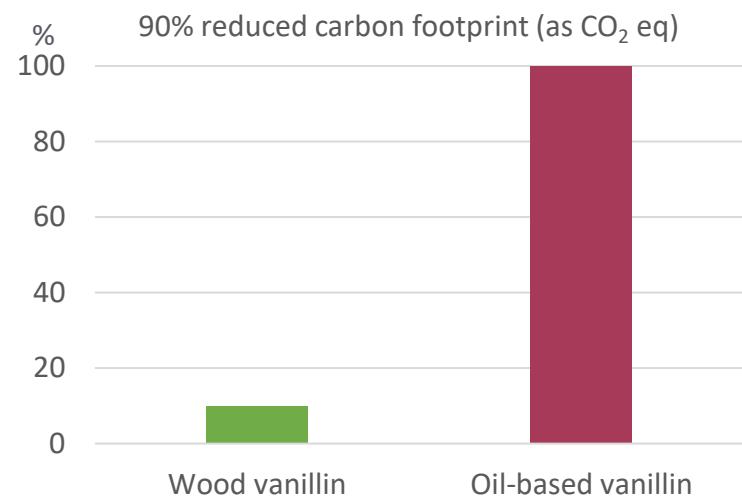
BIOVANILLIN - WELL POSITIONED FOR GROWTH

Strong demand growth for plant-based vanillin

- Consumer preferences
- Sustainability

Competitive edge

- Global market leader in plant-based vanillin
- Attractive flavour profile
- Unique raw material base
- Certified spruce wood, sustainable forestry
- >90% reduced carbon footprint vs oil-based vanillin
- Cost competitive technology
- Capacity expansion ongoing



BIOETANOL - INNBLANDINGSKRAV TIL DRIVSTOFF

- Borregaard produserer 2. generasjons bioetanol.
- Krav om at bioetanol til drivstoff må være bærekraftsertifisert.
- Standard ISCC EU
 - Massebalanse
 - Bærekraftskriterie

Favourable climate footprint

Fuel – production and use



Borregaard 2G bioethanol



Gasoline



SPECIALITY CELLULOSE – SUSTAINABILITY DRIVING GROWTH

- Increasing demand for wood certification and sustainability assessments driven by current consumer trends
- Customers active in consumer goods applications (food, pharma and personal care) are very committed to sustainable sourcing of renewable or biodegradable raw materials – growing interest in all segments
- Water based paints with ether-based thickeners gained share over the last 20 years at the expense of solvent based paints driven by reduction of volatile organic carbons emissions by law
- Cotton is becoming increasingly controversial. Cotton linters(CLP) is a competing alternative to specialty cellulose.
 - CLP has a significantly larger environmental footprint compared to specialty wood pulp



GOD MILJØDOKUMENTASJON VESENTLIG FOR EIERE/INVESTORER

- Krav til bærekraftsrapportering – Standard for Global Reporting Initiativ (GRI)
- Innføring av taksonomi - harmoniserte kriterier for økonomisk aktivitet som ansees som bærekraftig etter seks miljøkriterier.
 - Klimaforbedring
 - Klimatilpasning
 - Bærekraftig bruk/beskyttelse av vann- og havressurs
 - Sirkulærøkonomi
 - Forurensningsforebygging/-styring
 - Beskyttelse/restaurering av biodiversitet og økosystemer.
- God miljødokumentasjon og miljøprestasjon viktigere enn noen sinne.

