C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Borregaard operates one of the world's most advanced biorefineries. The Group provides sustainable products and solutions based on renewable raw materials and unique competence.

A BIOREFINERY WITH HIGH VALUE-ADDED

The Group's business model is closely linked to the integrated nature of its biorefinery in Norway, which utilises the three key components of wood – cellulose fibres, lignin and sugars – to produce a diversified portfolio of products. The biorefinery utilises 94 percent of the feedstock to make biochemicals, biomaterials and energy that can replace oil-based products. In addition to its biorefinery in Sarpsborg, Borregaard has 5 production sites outside Norway dedicated to producing lignin-based products. In total, the company has manufacturing operations and sales offices in 13 countries in Europe, Asia and the Americas serving its global customer base. At the end of 2021, the Group had 1,072 full-time equivalent (FTE) employees.

SPECIALISATION IN GLOBAL NICHES

Borregaard is a supplier of specialised biochemicals and biomaterials to a global customer base. The Group's main products are lignin-based biopolymers and biovanillin, speciality cellulose, cellulose fibrils, fine chemical intermediates and second-generation bioethanol. The products are used in a variety of applications in sectors such as feed and agriculture, construction and building materials, food and pharma, personal care, batteries, biofuel and various other industries. The Group's strong market positions have been developed through in-depth understanding of its markets, production of advanced and specialised products and local presence in the form of a global sales and marketing organisation.

COMPETENCE AS THE MAIN COMPETITIVE ADVANTAGE

Borregaard is a competence-driven company with production, research and development (R&D) and sales and marketing as its core competencies. To maintain its leading position, the Group has a strong focus on training programmes and cooperation between the various disciplines. Borregaard has a leading research centre combining various chemicals disciplines, biotechnology and microbiology, developing new or improved products, applications and production technologies. The Group had 90 employees in R&D as of 31 December 2021.

SUSTAINABLE BUSINESS MODEL

Sustainability is a key element in Borregaard's business model and one of the Group's core values. This is reflected in the Group's main objective: Providing sustainable products and solutions based on renewable raw materials and unique competence. Our understanding of sustainability and corporate responsibility derives from the fact that our business model itself, the way we run our company and the products we produce, is sustainable and meets global needs.

The UN predicts population growth of around 10% by 2030, which will generate resource scarcity and an extraordinary demand for climate friendly solutions in our daily lives. The UN has defined specific sustainability goals and measures within areas such as access to raw materials, energy, food and infrastructure. These factors are expected to increase demand for sustainable products and will present opportunities for Borregaard's innovative solutions in terms of creating good lives within a sustainable framework, also identified in the climate scenario analysis that Borregaard conducted in 2021.

Borregaard will take climate action and demonstrate how our business can help to advance sustainable development by both minimising negative environmental impacts and maximising positive environmental impacts. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment report released in August 2021 provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades, and finds that unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, limiting warming

to close to 1.5°C will be beyond reach. Borregaard has been committed to the Science Based Target initiative (SBTi) since 2017 and are now in a process of revising our target to a 1.5°C temperature increase in line with SBTi's Business Ambition for 1.5°C campaign.

Borregaard has engaged an independent third party, Norsus, to conduct a life cycle assessment (LCA) based on the ISO 14044/48 standard. The LCA analyses the environmental impacts of our production, from raw materials to finished products. The LCA confirms that the environmental and climate footprint of Borregaard's products have diminished over time. Borregaard's bio-based products do well from a climate perspective when compared to oil-based alternatives. Borregaard has made large efforts to reduce greenhouse gas emissions in its own processes by elimination of heavy oil consumption and increasing the amount of energy derived from more eco-friendly energy sources.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2021	December 31 2021	Yes	1 year

C0.3

(C0.3) Select the countries/areas in which you operate.

Czechia
Germany
Norway
United Kingdom of Great Britain and Northern Ireland
United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

NOK

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C-CH0.7

(C-CH0.7) Which part of the chemicals value chain does your organization operate in?

Row 1

Bulk organic chemicals

Bulk inorganic chemicals

Chlorine and Sodium hydroxide

Other chemicals

Specialty organic chemicals

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	NO0010657505

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	The President and Chief Executive Officer (CEO) is the highest responsible for climate-related issues under the Board of Directors as climate-related issues are part of Borregaard's business strategy and are considered important for the company's long-term success. The CEO is ultimately responsible for monitoring, assessing, and managing climate-related issues, including climate-related risks and opportunities. The CEO leads the Group Executive Management and reports sustainability risks and strategic issues to the Board of Directors continuously as relevant issues arise. The responsibility for climate issues lies with the CEO because it is of utmost importance for the company that the CEO has a complete picture of all climate-related issues that can affect the business plan and can then also allocate the right resources to achieve the long-term strategies and goals. A climate-related decision made by CEO in 2021 was to commit to a near and long-term company-wide GHG emission reductions in line with the 1.5°C Science Based Targets initiative's (SBTi). Thus Borregaard will update our well below 2°C target, that was approved by SBTi in 2019, to a 1.5°C target.
Director on board	The Board of Directors is responsible for the decision of the overall climate-related goals at Borregaard in the yearly strategical processes. The Board of Directors considers climate-related issues when reviewing and guiding strategy, risk management policies, annual budgets, and business plans, as well as setting Borregaard's performance objectives. A climate-related decision of the Board of Directors in 2021 was the investment in the Norwegian marine biotech company Alginor. The company aims to develop, produce and market high-value ingredients to global markets for pharmaceutical and nutraceutical applications based on biorefining of kelp. There are several similarities between Borregaard's business model and Alginor's biorefinery concept. Borregaard has acquired 25% of the shares in Alginor, representing a total investment of NOK 144 million. The potential for develop, produce and sell bio-based products with favourable climate and environmental footprint that can replace oil-based products can be increased.
Chief Procurement Officer (CPO)	The Senior Vice President Strategic Sourcing (SVP) (The Chief Procurement Officer, CPO) is member of the Sustainability Board and the Group Executive Management, and reports to the CEO. The CPO is responsible for climate-related issues for Borregaard, in terms of sourcing activities, including sourcing of energy, chemicals, and transportation, which are substantial emissions sources for the Group. The SVP is also responsible for ensuring sustainable sourcing of natural, renewable raw materials and that Borregaard reaches its target of sourcing only certified wood. In this role, the SVP must ensure that all suppliers meet a set of requirements, including climate-related requirements, and that key suppliers improves their work on sustainability. The purchasing of renewable energy, new renewable energy transportation solutions, more sustainable requirements of new installations and frame conditions for climate-related supplier issues are also within her responsibility - including the plan for how to achieve The Groups Scope 3 target. Thus transition risks like increased raw material cost, energy cost and sourcing of renewable electricity is within the CPO's responsibility. A climate-related decision made in 2021 was to to collect more detailed supplier data in a more efficient and automated way. The purpose is to make data-driven decisions on innovation and sustainability, and measure and track CO2 emissions. A web-based solution for supplier interaction is also in process.
Other C-Suite Officer	The Senior Vice President Organisation and Public Affairs is chair of the Sustainability Board which coordinates all sustainability activities in Borregaard to ensure exchange of best practice and that the company has sufficient progress and anchored priorities. One of the SVP's responsibilities is to ensure that Borregaard's sustainability policies (e.g., Climate & EHS policy, code of conduct, human rights policy, and anti-corruption policy) are up to date and in accordance with best practice. The SVP is leading the processes of setting scienced-based targets, developing management routines and input to the Audit and Sustainability Committee, and contributing to input for monetary incentives and investments for climate-related activities. The SVP and the Sustainability Board are responsible for both assessing and coordinating climate-related risks and opportunities. In order to offload the CEO in the day-to-day strategic environmental work, the SVP has been appointed the responsibility as chair of the Sustainability Board. The SVP is a member of the Group Executive Management and reports to the CEO. In 2021 several measures like updated scenario analysis, separate TCFD report, commitment to updated of the companies Science based target to a 1.5oC target and updated Climate and EHS policy have been conducted to strengthen and develop the Groups business model from a sustainable perspective in the whole value chain. A climate-related decision in 2021 from the SVP, has been to increase sustainability reporting according to new requirements from stakeholders and in line with the development in the EU Green Deal regulations. To publish a separate annual TCFD report, including and update of the scenario analysis. is example of decisions taken in 2021.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	Climate-related issues are integrated into Borregaard's governance mechanisms. The Board of Directors considers climate-related issues when reviewing and guiding strategy, risk management policies, annual budgets, and business plans, as well as setting Borregaard's performance objectives. This is done in some of the meetings. In a yearly Board meeting, the Board decides if there should be changes in the overall climate-related goals at Borregaard, and monitors the progress towards the mid-term and long-term science-based targets. An annual summary of the climate objective, climate risks and opportunities and other focus issues is prepared for the annual report and sustainability report which is approved by the Board of Directors. The Board of Directors also oversee major capital expenditures, acquisitions and divestitures, and climate-related risks have been considered in the process. A separate TCFD report was published in 2021, as a result of increased focus on climate related financial risks. Status of implementation and performance of projects are presented to the Board for approval. The goals, progress and new investment plans are communicated externally in Borregaard's Sustainability report. Investment at a certain level must be approved by the board. The climate-related Key Performance Indicators (KPI's) for the Borregaard Group are reviewed in each Board meeting. The KPI's show the Borregaards progress against goals and targets for addressing climate-related issues. The Board has established a permanent subcommittee, the Audit and Sustainability Committee (ASC). The committees pass no resolutions, but supervise administrative work on behalf of the Board and prepare items for decision by the Board. The Audit and Sustainability Committee supports the Board in fulfilling its responsibilities with respect to financial and sustainability reporting, internal accounting controls and auditing matters. The CEO reports current issues including sustainability issues to the Audit and Sustainability Committee and to the Board of Directors. The CEO meets the Board and ASC 6-8 times a year

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	We have board members that we consider having competence on climate-related issues. When we are assessing the competencies of board members in relation to climate/forest/water, where we evaluate their relevant education and also their career experience and expertise. We are assessing the competencies case by case, but the overall criteria we are setting for our board representatives are based on their competence in the relevant field (climate, forest and water) based on their past and present responsibility and engagement in similar activities in other companies. For example, our chairman of the board has climate/forest/water competencies based on their professional experience and the roles they have occupied in similar companies, where this person is the CEO of a company focusing on biocarbon storage. Our chairman of the board has, among other, responsible for climate-related initiatives within energy ('ENØK'), greenhouse gas reduction initiatives and clean processes, and also products, including the importance of how our operations impact water and forests.	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	More frequently than quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

The Audit and Sustainability Committee

The Board has established a permanent subcommittee, the Audit and Sustainability Committee. The committees pass no resolutions, but supervise administrative work on behalf of the Board and prepare items for decision by the Board. The Audit and Sustainability Committee supports the Board in fulfilling its responsibilities with respect to financial and sustainability reporting, internal accounting controls and auditing matters.

President and Chief Executive Officer (CEO)

Borregaard's main objective is to develop sustainable solutions based on renewable raw materials and unique competence, which results in products with low CO2 footprints, this means that the responsibilities for climate-related issues have been assigned to the CEO. President and CEO is responsible for both assessing and managing climate-related risks and opportunities. The Sustainability board are assessing the issues, and the chairman, SVP of Organisation and Public Affairs, reports progress of the work to the CEO and President. Each member of the group Executive Management is responsible for managing of climate-related issues within their respective areas.

The Sustainability Board

The internal sustainability board addresses and monitors important sustainability topics, and initiates processes in which guidelines, goals and measures are developed within the areas covered by this report. The sustainability board reports to the President and CEO and is chaired by the SVP of Organisation and Public Affairs. The status of the work by the business areas involving corporate responsibility is included in the Sustainability and corporate responsibility report. The members of the board represent the whole value chain of Borregaard and have relevant background and experience within sustainability aspects in Borregaard.

Members and responsibilities within the Sustainability Board for climate related issues:

- SVP Organisation and Public Affairs (member of The Group Executive Management): Chair of the Sustainability Board.
- Chief Financial Officer (member of The Group Executive Management): Responsible for financial climate-related issues, including risk.
- Senior Vice President, Procurement and Strategic Sourcing (member of The Group Executive Management): Responsible for the main activities along the supply chain within climate-related issues; biomass, energy, transportation and frame conditions.
- Director Investor Relations: Responsible for climate-related issues from investors perspective.
- Chief Technology Officer, BioSolutions; Responsible for climate and sustainability communication in the BioSolutions sales organisation and towards customers.
- Technical Service Manager, BioMaterials; Responsible for climate and sustainability communication in the BioMaterials sales organisation and towards customers.
- EHS and Sustainability Manager: Responsible for climate and sustainability monitoring and reporting system.
- Communication Manager: Responsible for external climate and sustainability communication and project manager for the Sustainability report.
- Marketing and Sustainability Coordinator: Secretary of the Sustainability Board and responsible for coordinating climate and sustainability related issues.

The Sustainability Board will address and follow up on important topics and initiate processes aimed at developing policies, actions and goals within the sustainability area. The Stakeholder and materiality analysis for Borregaard that specifies what is important for and relevant for Borregaard and its stakeholders is updated yearly by the Sustainability Board.

The Board reports to the President and CEO.

How climate-related issues are monitored

- Emission data for all activities and sites are reported according to the Green House Gas Protocol Standard
- Key Performance Indicator monthly reports for monitoring the most important climate and energy data and progress against targets, at different sites and at company level.
- Life Cycle Analysis for products and their reduction potential are systematically identified to make progress in innovations for more sustainable products.
- Markets are analysed/market reports for opportunities in renewable and climate friendly products.
- Investment proposals for new projects contains climate gas reduction data.
- Climate scenario analysis and risk and opportunities according to the TCFD framework updated yearly.
- Transitional risk/opportunity data: Changes in framework conditions including funding of climate projects and energy costs in operating countries are monitored and evaluated and possible impacts for markets we operate in.
- Physical risk/opportunity data: For different assets like wood sourcing and energy and precipitation and drought as operational risk at the different sites are evaluated.
- Materiality and stakeholder analysis, monitoring and evaluating the most important climate-related issues for our key-stakeholders.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	The members of The Group Executive Management, in addition to a number of leading employees, have a bonus programme, as published in the company's annual report. The bonus elements are linked to the goals of the company and each member has a mandatory sustainability target as one of their personal targets. The company has a share option programme with approx. 30 participants every year. Options can be allocated to leading employees who have achieved good results and where the company wants to make a long-term commitment with the employee. Sustainability/ESG performance is one of the criterions for nominating employees for the programme.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Chief Operating Officer (COO)	Monetary reward	Energy reduction target	Plant Director of Borregaard's Sarpsborg Site (Norway), Member of The Group Executive Management, (COO), is part of the company's bonus scheme and receives a monetary reward in terms of a salary bonus if given commitments and targets are met by the end of the year. The bonus scheme consists of three elements/level of measures: Financial results of the company, EHS performance of the company and an individual part. He has a bonus linked to the companies energy efficiency target. The achievements of the COO are measured by a yearly review in which the agreed goal and objectives are addressed. The thresholds for success are: Outstanding performance: Expected bonus level 7-10%, Good Performance - targets achieved: 4-6% and Low performance - targets not achieved: 0+3%. In 2021 this bonus programme frame was about 5-10% of salary and he received 50.000 NOK linked to energy efficiency target.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	1	4	Short- 4 years - Borregaard's strategic period/financial targets has a 4 years horizon. The strategy is updated yearly, in year n (reporting year) we are looking at the strategy for year n+1 to year n+3. In this reporting year 0 is 2021, year 1 is 2022, year 2 is 2023, year 3 is 2024, total of 4 years horizon. The description of our response to a risk or an opportunity and explanation of calculations in the short-time horizon mainly are in the period from 2021-2024, but it could also include description of activities that started up earlier to mitigate a risk or exploit an opportunity. Quantitative risk assessments are done for all multidisciplinary processes. Financial impact evaluated as in question C.2.1b
Medium-term	4	9	Medium - Borregaard has committed to a Science based target (SBT) in 2030, the target is approved by SBTi. In this reporting year 0 is 2021, year 1 is 2022. Plan to realize emission reduction within this period is established and risks and opportunities related to climate change in medium-term is evaluated. Borregaard's environmental strategy contains a group-wide objective to achieve a reduction of greenhouse gas emissions by 2030 in line with a 1,5°C target from a 2020 base year. Plans to realize emissions reductions in this time period is established, and risks and opportunities related to climate change is evaluated
Long-term	9	29	Long - Borregaard has committed to a Science based target (SBT) in 2050, the target is approved by SBT. In this reporting year 0 is 2021, year 1 is 2022. As climate-related issues often manifest themselves over a longer time-horizon, long-term time-horizon is expanded over 25+ years in our physical climate risk assessment. Plan to realise emission reduction within this period is established.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

The Substantive financial impact definition for Borregaard Group:

EBITDA is defined by Borregaard as operating profit before depreciation, amortisation and other income and expenses.

In 2021 EBITDA was 1,372 mill NOK and in 2020, 1,132 mill NOK.

The financial impact is defined as substantial within a short-term (3-years) period in our risk management process for the following quantifiable indicators

Low EBITDA effect:	0-25 mill NOK
Medium EBITDA effect:	25-50 mill NOK
High EBITDA effect:	> 50 mill NOK

The probability is also considered.

Low probability:	0-50%
Medium probability:	50-75%
High probability:	75-100%

The combination of high and medium probability with high EBITDA and the combination of high probability with medium EBITDA is defined as the substantive financial impact.

In 2021 a loss in EBITDA of 50 mill, would have reduced the EBITDA margin by 0.8%-points from 23.6% to 22.8 %. A 0.8%-points drop (or increase) in Borregaard's total EBITDA margin from a single indicator is, in the company's opinion, a substantive impact, because this level would probably have influenced our stock price. Borregaard's different business units are closely linked together as they mainly are different parts of the large integrated biorefinery in Norway. As a consequence, it makes sense for Borregaard, as well as for shareholders and customers, to primarily consider the size of the impact on the totality instead of the different business units.

The definition is valid for impacts in the whole value chain that the Borregaard Group operates in. In a medium-term and long-term perspective, impacts considered as a substantive financial impact could be higher than the range used for short-term. Risk reducing activities will be taken to reduce the future negative impact, according to the Groups risk management system.

When the financial impact is used in the risk management process information of the probability of occurrence is also considered.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
Borregaard identify and assess company-level climate risks within our risk management model (ISO 31000). We have also used the TCFD framework to identify the most significant climate-related driving forces that are relevant for Borregaard and that might bring positive or negative financial or strategic impacts for the company. Borregaard assesses climate-related risks and opportunities on current, short term (1-4 years), medium-term (4-9 years) and long-term (9-29) time-horizons. Borregaard uses the ISO 31000:2009 Risk management - Principles and guidelines as our definition of risk terminologies. Borregaard further uses ISO 31000 as our risk management model to identify, assess, and manage risk, including climate-related risk. The process defines the financial or strategic impact of climate-related risks. As defined by Borregaard, risks with substantive financial impact are risks with low, medium, or high negative effect on the Group's EBITDA in different time horizons. Climate-related risks are integrated into Borregaard's multi-disciplinary risk management process, and climate-risks are assessed more than once a year. Within risk framework, the sequence is to initiate, assess, analyse, plan for initiatives, implement, and review. To identify opportunities, Borregaard's R&D department work in close co-operation with sales, manufacturing, customers (actual and potential), external institutes, and universities in several countries. Borregaard's innovation success is a result of world class in-house R&D and close co-operation between sales, manufacturing, customers and external institutes and universities in several countries. The innovation work is organised in one "Innovation Management Team" for each business unit. The teams are cross functional and work with the whole portfolio, from idea to implementation and has resulted in innovative developments of low emissions products and solutions. The opportunities are evaluated on if they can have a substantive financial of the Group's EBITDA with low, medium, or high positive effect in different time horizons and strategically if they are within markets that are expected to increase due to increased demand for sustainable products and solutions. The measure of success is to have yearly innovation rate of 15%. A central risk management function has been established in Borregaard headed by the Chief Risk Officer (CRO), who is responsible for Borregaard's risk management model and the implementation of the risk management process. However, each member of the Group Executive Management is responsible for identifying and manage climate-related risks within their respective areas. The individual unit managers in the Group are also responsible for acquainting themselves with all significant risk factors within their area of responsibility, thus contributing to a financially and administratively sound handling of these risks. Even though the members of the Group Executive Management and the individual unit managers have their responsibilities, it is the CRO that has the overall responsibility of managing climate-related risk across all business areas and disciplines. The purpose of the bottom-up risk management process is to provide an overview of the risks and uncertainties Borregaard is exposed to and to support value creation, ensure risk awareness and balance risk versus return for the entire company. The aggregated risk picture in Borregaard is consolidated by the CRO and reviewed by the Group Executive Management before it is submitted to the Audit and Sustainability Committee, and finally to the Board. The Board conducts a review of the Group's risk picture at least annually.
IDENTIFICATION AND ASSESMENT OF CLIMATE-RELATED RISIKS AND OPPORTUNITIES THAT COULD HAVE A SUBSTANTIVE FINANCIAL IMPACT: Borregaard identifies and assesses asset level climate-related risks and opportunities within the framework of our common process for risk and opportunity management. The Group identifies sources of risk, areas of impacts, events, and potential financial or strategic consequences and implement mitigation activities. The risk identification work starts with the initiating phase. In this phase of the process, the acceptance criteria associated with the risk is set to ensure the correct probability and consequence scales for the business. The sequence is then to assess, analyse, plan for initiatives, implement the initiatives and review them. There is a set of predefined criteria for how risks are assessed using a risk register scale. The probability and the consequence of the risks are rated as "Low", "Medium" or "High" and are visualized in a matrix. Once a risk has been assessed and analysed as high enough, initiatives to mitigate the risk are implemented. The identified risks present an aggregated risk picture for Borregaard covering the entire Group's operations, and they have a high impact on our EBITDA. The owner of the risk factors implements relevant mitigation strategies and activities and consult the Group Executive Management in the process. This process is relevant for all parts of your value chain: direct operations, upstream and downstream. In line with the TCFD disclosure recommendations, Borregaard has published a TCFD report for 2021, as an integrated part of Borregaard's annual financial reporting.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Borregaard decision on the relevance and inclusion of this risk type. The risk type current regulation is relevant and always included because it has a potential to influence the direct cost, especially for energy cost which are exposed to carbon pricing regulation/mechanism. An example of a specific risk considered in our assessment: Borregaard's site in Sarpsborg is subject to the EU's emission trading scheme (EU ETS). The price of carbon is forecasted to increase to $140/ tonne by 2040 and the allocation of free allowances will decrease, impacting Borregaard's operational costs. The Borregaard Group uses about 1700 GWh energy in direct operations to produce products, and energy cost is about 10% of the total cost at Borregaard Group. 1) EU-ETS; climate allowances and energy cost 2) EU RED directive: Renewable energy consumption. 3) Norwegian Climate Act to reduce the Norway's total emission in line with the IPPC RCP 2.6 before 2050. How the risk type is included in the climate-related risk-assessment: Current and emerging carbon pricing mechanisms are considered a short to medium-term risk, with high financial impact. The risk is an integrated part of business plans initiated and the priority of this risk is high. Because this is a risk associated with current regulation the mitigation of the risk is operational, Borregaard has implemented several risk mitigation activities such as increased use of renewable energy to reduce consumption of Liquid natural Gas and energy efficiency measures. The company has committed to a net-zero science-based target for reducing its scope 1, 2 and 3 GHG emissions according to the 1.5℃ ambition. As example in 2018 a facility for storing biogas was installed, as a result the amount of LNG/Propane used was reduced. These risk mitigation activities have resulted in reduced exposure to carbon pricing regulation. In addition 98% of the energy used in the Group is ISO 50001 certified, which means that continuous improvement processes for energy reductions are installed.
Emerging regulation	Relevant, always included	Borregaard decision on the relevance and inclusion of this risk type: Framework conditions for energy and climate matters are changing rapidly promoting the transition to a carbon-neutral society, this can results in both risks and opportunities for Borregaard's business. We monitor and engage actively, e.g. in the development of the Fit for 55 regulations from the European Green Deal intiative, in cooperation with European and national industry associations An example of a specific risk considered in our assessment: On December 14, 2021, the Norwegian Parliament voted to approve the incorporation of the EU taxonomy into Norwegian Law. However, the Taxonomy requirements will not come into force in Norway until the regulations are incorporated into the EEA Agreement, which is expected to happen in 2022. The Taxonomy is under development and the technical screening criteria for water, pollution, circular economy and biodiversity will be published in 2022. The rationale to include the Taxonomy regulation into our risk assessment is that the degree of taxonomy alignment will probably have impact on how our stakeholders consider Borregaard as a company contributing substantially to the low-emission society and could impact share price. Borregaard's biorefinery concept, with low-carbon emission products from natural renewable raw materials, makes a substantial contribution to the climate change mitigation, but it is still unclear how the biorefinery concept will be aligned with the Taxonomy. We did an assessment to the Taxonomy regulation, were we outlined our approach in a separate report published together with the Annual Report for 2021. Borregaard's activities could be relevant for two of the environmental objectives: • Climate change mitigation • Transition to a circular economy We calculated that 5 % of our sales revenues in 2021 was aligned by the already published criteria. In total, about 60% (close to NOK 3.5 billion) of sales revenues came from biobased products with lower climate/environmental footprint compared with synthetic/oil-based products, that will or could be Taxonomy eligible based on coming criteria's for low emission product contributing to climate change mitigation. For the circular economy criteria with did not estimate how much of sales revenues that could be aligned. In cooperation with European and national industry associations we are monitoring the development in the taxonomy regulation and the impact on our business.
Technology	Relevant, always included	Rationale technology: To expensive and /or uncertain technology for development into low emissions society. Borregaard decision on the relevance and inclusion of this risk type. Risk of the company not being able to reach ambitious climate reduction targets within RCP 2.6. Borregaard has committed to a Science based target for reduction in CO2 emissions in 2030 and 2050. An example of a specific risk considered in our assessment A higher degree of electrification of the energy consumption at the biorefinery in Norway – either directly or indirectly – is necessary to meet our 2030 Science Based Targets. In order to mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption, thus to switch from technology that uses steam to technology that uses electricity is important. We are now looking into the possibility for finding technology to electrify the drying of lignin powder instead of using natural gas. In Norway electricity is renewable due to mainly from hydropower and wind. The 2050 target is dependent on development of Carbon Capture and Storage Technology for CO2 emissions from energy production, we are monitoring the technology development by participating in a local initiative for the industries close to our operation in Sarpsborg. Norwegian Federation (NI) has made a road map on how Norwegian Industry can transform into the low emissions society. This transformation is dependent to some extent on the authorities' willingness to funding of project with high financial and technological risk. Borregaard has worked together with NI with relevant input and learned more about what factors that are important for the transformation. More electricity (renewable) available (production capacity and transfer capacity in the grid), capture and storage of CO2- gas, reduction in energy use are important topics, that Borregaard does a qualitative evaluation on how to exploit the technology development and are working with our long-term reduction plan to find the right technology.
Legal	Relevant, always included	Rationale Legal: Borregaard's operations must mitigate the rules and standards for climate gas allowances within the EUETS system for the operation in Norway. The Norwegian Environment Authorities is responsible for the legislation in Norway. Borregaard decision on the relevance and inclusion of this risk type: If we do not have the right processes in place to mitigate the reporting rules and standards for reporting of climate gas emission to the Norwegian Environment Authorities Borregaard will not receive allowances for the emission of CO2. An example of a specific risk considered in our assessment : Borregaard's CO2 emissions that are within the EUETS system for climate gas allowances, stem mainly from the use of heat energy in the production processes at our site in Sarpsborg. This heat energy is produced from municipal waste, liquid natural gas and some light oil. It is required to have procedures in place that describe how CO2 emission from these sources are calculated. In addition, the calculation needs to be verified by 3. party. If the data are not verified, or we don't report on time to the authorities as legally required the number of climate gas allowances we have used, we risk to not receive eligible CO2 allowances. For the next EUETS period (2021-2030), not only the yearly emission but also the number of free allowances received must be calculated and verified, thus the legal requirements will increase.
Market	Relevant, always included	Borregaard decision on the relevance and inclusion of this risk type: In the coming years, we believe there will be large environmental transitions that Borregaard could provide solutions for. Today, Borregaard makes biochemicals and biomaterial with low carbon footprint that can substitute a variety of oil-based products in different sectors. With our high innovation effort, we will be able to increase value-added for these products and develop new products in to new markets. Borregaard's risk exposure to applications and markets within oil and fossil energy systems is limited. Our products within these markets either represent an improvement in an established value chain or can, with further innovation efforts, be used in the manufacturing of products for more sustainable applications. Consequently, these products may represent new sustainable long-term opportunities. Thus, we have included this risk type, to make sure that we have the right processes in place to exploit the opportunities in market for new climate friendly products. An example of a specific risk considered in our assessment: Borregaard produces second generation bioethanol at its production facilities in Sarpsborg. The market for biofuel in fuel for road traffic has increased because, the renewable energy directive RED II require that member states must require fuel suppliers to supply a minimum of 14% of the energy consumed in road and rail transport by 2030 as renewable energy. In 2018 Borregaard invested in upgrading of its bioethanol plant to produce qualities that could be used for biofuel, to meet the increased marked demand for biofuel. Borregaard has increased the production capacity of 99% (absolute) bioethanol with 11-12 million liters after realization of an investment in the bioethanol. Our risk mitigation response is that we have process in place in our R&D and sales and market departments to continue to see business opportunities in several markets where our bio-based products can contribute to improved sustainability in different value chains. Borregaard's strategic priorities lie within specialisation through innovation and market development for our wood-based products. Targeted investments improving our ability to make higher value-added products have been, and will continue to be, an important risk mitigation response to shifting markets.
Reputation	Relevant, always included	Borregaard decision on the relevance and inclusion of this risk type: To have a positive and strong reputation as a sustainable and climate friendly company are extremely important and relevant for Borregaard. The main objective is to offer sustainable products and solutions to our customers. If we do not have the right processes in place to maintain and build a strong sustainability reputation, customers, community and other stakeholders perception of Borregaard as a sustainable company that contribute to the transition to a lower-carbon economy will be lost. This risk could result in reduced price premium for products and lost markets, reduced price of the Borregaard share, difficult to attract competent new employees in recruitment processes. An example of a specific risk considered in our assessment: • Documentation of ESG aspects through life cycle analyses (LCA) and environmental product declarations (EPD) is an integral part of the risk mitigation activities. The LCA confirms that the environmental and climate impacts of our products and processes have diminished over time. When having a standard and recognized way of documentation of sustainability we avoid being accused for "Green washing", which we see happens to companies that claim they are green without being able to show it. The requirements for documentation of sustainability is increasing, thus we have processes in place to uncover and understand the the development, thus we can meet the requirements of sustainability documentations from our stakeholders. We have processes in place to measure the sustainability perception from several of our stakeholders, this gives us valuable information in areas that we need to develop our sustainability communication pr documentation further to mitigated the risk of lower reputation: • Measure the reputation in its neighbourhood, the results show that the reputation has changed in a positive way our the last years • Analyse the price of its share at Oslo Stock exchange, and the results show that it is positively influenced by a strong and positive sustainability reputation. • Analyse feedback from the recruiting process. When interviewing new employees, several employees says that Borregaard's sustainability performance is one reason for application for a job.
Acute physical	Relevant, always included	Borregaard decision on the relevance and inclusion of this risk type: Acute physical risk can lead to delays in the value chain, impacting the company's operational costs. An example of a specific risk considered in our assessment: The transportation to Borregaard site in Norway is likely to be impacted by acute weather events such as heavy rainfall. Heavy rainfall can trigger increased frequency of landslides, potentially blocking road and rail transportation routes. This can lead to delays in the value chain, impacting the company's operational costs. To mitigate the risk of disruptions to the value chain, Borregaard sources wood from different locations in Norway and Sweden, we have alternative transportation modes for several of our routes, and we can store larger volumes of wood if needed. Heavy rain can also trigger quick clay landslides at the Sarpsborg site. This can potentially damage on-site infrastructure and buildings, and in worst case stop the production. When new buildings or infrastructure are built, this inherent risk is always accounted for, and financial impact of the risk is further mitigated by insurance solutions.
Chronic physical	Relevant, always included	Borregaard decision on the relevance and inclusion of this risk type: Chronic physical risk can interrupt inbound and outbound logistics from our sites, investment in new logistics solutions impacting the company's operational and capital costs. An example of a specific risk considered in our assessment: The risk of sea-level rise is likely to impact Borregaard's site in Fernandina Beach in Florida. Even if the global temperature stays well-below 2°C, the sea level will rise to 0.15 meters in 2030 and to 0.28 meters in 2050. Sea-level rise at the Florida plant can interrupt inbound and outbound logistics from the site, damage equipment and potentially flood the site. The site in Florida was built in 2018-2019, and Borregaard was well-aware of the potential physical climate impacts. Thus, to mitigate this risk of disruption in production, Borregaard can source products from other sites to ensure that the customers receive their products. This risk is also mitigated by insurance solutions.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Risk 1

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Current regulation	Carbon pricing mechanisms

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Biorefining of wood at the biorefinery in Sarpsborg in Norway into speciality cellulose, lignin-biopolymers, bio-vanillin, bioethanol and cellulose fibrils requires 1586 GWh of energy (2021), including the operations of utilities. Due to the high utilisation of wood into products, it is a limited quantity of residual biomass and biogas available for internal supply of energy. Therefore, Borregaard obtains heat energy from additional sources like renewable electricity(power), energy recovery from production processes, incineration of sorted household waste and natural gas, the renewable part of this energy mix was 48% in 2021. The energy cost for Borregaard increased from 8 % of the total cost in 2020 to 11% of the total cost (4.4 billion NOK) in 2021, due to the high share of total cost, the risk exposure to increased energy cost to changes in EBITDA is high. The sensitivity analysis on EBITDA from base in 2021, shows that 1 % increase in Energy cost gives 5 million NOK reduction in EBITDA, thus exposure for energy cost due to carbon pricing mechanisms is substantial. The CO2 emission from our biorefinery is covered by the European Union Emissions Trading Scheme (EU ETS). The inherent risk of high cost for CO2 emissions due to EU-ETS mechanism, has been mitigated by investing in renewable energy sources and improving energy efficiency at Borregaard's Sarpsborg operations. During the past decade, we have implemented an energy strategy to replace the use of heavy fuel oil with more climate and eco-friendly energy sources, like more use of liquid natural gas, biogas and biofuel. The investments is the major reason for 32% reduction in Borregaaard scope 1 and scope 2 CO2 emissions from 2009 to 2021, and in a surplus of CO2 emission rights, EUA allowances. As of 31 December 2021, Borregaard owns 741,969 CO2 emission rights. The EU-ETS mechanism has already contributed to raising the CO2 price significantly and had a clear effect on power prices in Norway in the last year, as countries and companies are demanding more renewable energy. Low availability of natural gas in Europe has resulted extremely high power prices in 2021. The Nordic power system is, closely interlinked with the power markets in continental Europe. Both fuel cost and CO2-price therefore have an impact on the power price in Norway and represents a significant financial risk as long as gas fired power plants in Europe, especially Germany, set the market price on the margin.

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
95400000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Our approach to calculate the potential financial impact figure from of increased operating cost due to increasing price of GHG emissions, have been to calculate the impact from the scenario that Borregaard: a)had got no free carbon credits/allowances (EUA) from (EU ETS) b) no energy/climate gas reduction mitigation activities had been implemented The assumptions for our calculations of the potential financial impact figure: The financial impact is calculated as an inherent effect of the EBITDA in 2021. Base year 2009 has been used, because this is the starting year in our current science-based target. EU-ETS Climate gas emissions level as base year 2009 was 176,000 tonnes CO2 for Borregaard in Sarpsborg. EUETS climate gas emission in 2021 was 137,759 tonnes CO2. The internal carbon price used is 542 NOK/ton, derived from average cost for climate allowances in 2021. The carbon price is calculated as ICE EUA front month and changed to Norwegian currency NOK. In 2021 the average carbon price used was NOK 542/ton CO2, maximum was NOK 921/ton CO2 and minimum was NOK 320/ton CO2. Financial risk mitigation: Reduction (because of investments) in climate gas emissions to 2021 level: 137,579 ton CO2 * 542 NOK/ton = NOK 74,6 mill /year Borregaard has free climate gas allowances (EUA) in the period 2013-2021: Actual cost: 137,579 ton CO2* 0 NOK/ton= 0 NOK/year. Due to the risk mitigation activities the actual effect on EBITDA 2021 is 0 NOK/year Borregaard in Sarpsborg have got free allowances for the period 2021-2025. The cost of EUA 's is expected to increase, 300-1000 NOK/ton, thus the impact will increase. We anticipate that after 2025 we will receive less CO2 credits, but our CO2 emissions will decrease due to our science-based target reduction plan, thus the need for credits might be balanced. Potential financial impact figure: Financial impact cost per year emission if no energy/climate gas reduction measures and if no free allowances (EUA) was obtained: 176,000 ton CO2 *542NOK/ton =NOK 95,4 mill /year

Cost of response to risk
134600000

Description of response and explanation of cost calculation
Borregaard in Sarpsborg's strategy includes a response to mitigate the risk described; increased indirect (operating) cost for energy, due to increased carbon price. A part of our strategy is to increase our amount of consumption of renewable energy, and also different energy reduction initiatives. Our implementation of the strategy described, started more than 15 years ago. As an example of a case study: Borregaard in Sarpsborg stopped using heavy fuel oil for steam production in 2013 when a new multifuel

boiler that mainly uses liquefied natural gas (LNG) was installed. LNG has 29% lower CO2 emissions per GJ fuel, compared with heavy fuel oil. In 2019 waste oil and propane was exchanged with LNG and biogas as energy sources , which reduced the CO2 further. In addition energy efficiency investment has been done. The CO2 emissions in this example has been reduced with 42 % since 2009. Borregaard continue to follow this renewable energy strategy in the years to come as part of the plan of achieving the Groups science-based targets. Risk response activities and explanation of cost calculation We have started to work on a long-term action plan to achieve the science-based targets for 2030 and 2050. Reduction in energy consumption with new technologies, availability of more renewable sources like electricity from hydropower and wind, and biogas obtained from own production. As our CO2 emission decreases the risk of increased CO2 cost will be reduced. Monthly evaluation of development in energy prices, energy consumption, changes in frame conditions are done to control the risk of increased CO2 cost. The cost of these activities are covered by the position as Energy Director, one extra manning, one FTE. 1 FTE = approx 1 mill NOK The main response to the risk is the investment in more increased renewable energy and energy efficiency. The investment that are covered in this calculation are project in the period starting for 2014 ending in 2020. Low temperature heat project (2014-2017) saved 70 GWh: Capex NOK 110 mill Synergi (2017-2018) saved 15 GWh: Capex NOK 30 mill Evaporation unit (2019): Capex NOK 12 mill Changed fuel from propane to LNG spray dryers 2019: Capex NOK 4,5 mill Changed fuel from waste oil to LNG bio boiler 2019: Capex NOK 26,6 mill Increased production of biogas 2018: Capex NOK 5,2 mill Low temperature spill project 2020: Capex NOK 2,3 mill Total cost of response to risk: CAPEX +FTE= 65+18+12+4,5+26,6+5,2+2,3+1 = NOK 134,6 mill

Comment
Borregaard in Sarpsborg is a significant consumer of electrical power. Power production in Norway is dominated by hydropower, and wind power is an increasing contributor. Precipitation, wind and temperature are therefore important price drivers for the electricity price, and consequently important cost factors for Borregaard in Norway. The trend towards wetter, wilder and milder climate may have bearing on the cost of electrical power for operations in Norway. The Nordic power system is, however, closely interlinked with the power markets in continental Europe. It is well established that these connections enable the short run marginal cost (SRMC) of coal and gas fired power plants in Europe, especially Germany, to have significant impact on the marginal power price in the Nordic market. Included in the SRMC for coal and gas for power production is the cost of CO2-allowances under the EU-ETS. Both fuel cost and CO2-price therefore have an impact on the power price in Norway and represents a significant financial risk as long as these fossil-based power plants set the market price on the margin. Risk from exposure to yearly fluctuations in the aforementioned factors is mitigated by entering long term renewable power purchase agreements. Furthermore, Borregaard has received indirect CO2 compensation from the Norwegian State until the end of 2020. Indirect CO2 compensation is a means to avoid carbon leakage and offsets part of the adverse effect EU ETS has on the power price for the electricity intensive industries in Europe. Through European trade organisations, Borregaard is working for a green and just transition, and the continued adoption of the indirect CO2 compensation for the 2021-2030 period. Uncertainty persists regarding the indirect CO2 compensation regime for this period, but Borregaard will still receive some compensation in the period 2021-2025.

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Upstream

Risk type & Primary climate-related risk driver

Market	Increased cost of raw materials

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Borregaard transforms forest raw material into high value-added products. At the biorefinery in Sarpsborg in Norway, we use 1 mill solid wood annually to produce, lignin biopolymers, speciality cellulose, biovanillin, bioethanol and microfibrillar cellulose for a variety of applications in sectors such as agriculture and fisheries, construction, pharmaceuticals and cosmetics, foodstuffs, batteries and biofuels. The cost of wood is 9% of the total cost (4.4 billion NOK) in 2021. 75%-85% sourced from Norway, Viken and Innlandet counties, and the rest mainly from Sweden. The contracts have an annual price and volume contracts with possibilities for mid-year adjustments, the cost of wood includes inbound logistics which is ~30% of wood cost. The sensitivity analysis on EBITDA from base in 2021, shows that 1 % increase in wood cost gives 4 million NOK reduction in EBITDA, thus risk exposure due to increase in wood price is substantial. In a world transitioning to a low-carbon economy, forests are likely to be more protected as forests are a natural ally in adapting to and fighting climate change and will play a vital role in making Europe the first climate neutral continent by 2050. In EU's Forest Strategy, it is stated that at least 30 % of EU's land area should be legally protected, hereunder strictly protecting ecosystems with the most potential to capture and store carbon (boreal forests from which Borregaard sources its wood) in trees and soil. More extreme weather such as storms, droughts, and forest fires can potentially also damage forests. There are several new initiatives in the Nordic region from other business that will produce biobased products from wood sourced from the Nordic region, predictions from the "Process Industry roadmap" and various new industrial projects in Norway indicate an increased need of 14-20 million fm3 of raw material from the forest up to 2050, which is more than a doubling of todays demand. Furthermore, it is expected that the requirements linked to the management of the forests and harvesting operations will be stricter to secure biodiversity and ecological standards, 99% of the wood purchased at Borregaard in 2021 was certified according to PEFC/FSC. Reduced availability of wood due to the above mentioned indicators will impact the market for wood availability, and will likely result in increased wood cost both in the short to medium time horizon, as supported by Borregaards updated scenario analysis.

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
50000000

Potential financial impact figure – maximum (currency)
300000000

Explanation of financial impact figure
Our approach to calculate the potential financial impact figure from increased cost of wood raw material, has been to use the knowledge we have of the marked for sourcing of wood in the Nordic region, and how it is expected to change due to increased demand of wood combined with less amount available, and how that will impact the cost.

Today approx. 11 million fm3 wood are logged as saw logs and pulpwood in Norway. At the same time, predictions from the "Process Industry roadmap" and various new industrial projects in Norway indicate an increased need up to a sourcing of 20-25 million fm3 of raw material from the forest up to 2050. The financial impact is calculated from an increased demand wood of 20-25 mill of solid m3 of wood in the Nordic sourcing area for wood, this represent an increase in demand of approx.15% within the sourcing area, and is more than the annual increment. Borregaard follows the development in wood prices closely, https://woodprices.com/wood-resource- quarterly/. This is used as tool to calculate how much it is likely that the direct costs of wood will increase when the demand increase or decrease. Historically in the period 2011 to 2016, it was a price drop of NOK 250 pr solid m3 of wood, due to reduced demand, opposite in the period 2017 to 2020 it was a price increase due to increased demand of NOK 150 pr solid m3 wood. This shows that the prices can vary a lot within the range of NOK +/-250. Based on this we assume if the demand increases as described in our case, the prices for wood can increase between NOK 50 and NOK 300 pr solid m3. For our operation in Sarpsborg which have a consumption of 1 mill solid m3 and the r total cost of wood in 2021 was approx 400 mill NOK . We assume the upper range is a maximum, because several pulp and paper companies will not be profitable if the price increase is higher. Minimum increase in total cost is 1mill solid m3 ea. year times NOK 50 = NOK 50 mill, 12,5 % increase. Maximum increase in total cost is 1 mill solid m3 ea. year times NOK 300 = NOK 300 mill, 75% increase. Borregaards sensitivity analysis on EBITDA from base in 2021, shows that 1 % increase in wood cost gives 4 million NOK reduction in EBITDA. MIN EBITDA 12,5% * 4 mill NOK = 50 mill NOK. MAX EBITDA 75%*4mill NOK = 300 mill NOK

Cost of response to risk
1100000

Description of response and explanation of cost calculation
To mitigate the risk of increased wood cost we have several responses: •Securing sustainable harvesting of wood so the forests can maintain targets for sequestering carbon and biodiversity we require that 100% of the wood is certified according to PEFC/FSC • We are a major purchaser of wood in Norway, in 2021 we bought almost 0,8 mill sm3 of wood in a market of about 11 mill sm3 in Norway • To secure the supply of wood, we have long term contracts w/the two largest forests assoc. and 13 sawmills, the contract horizon is more than 3 years, which also give time for development of the supplier because of predictable conditions, and we have ownership in a Ringalm sawmill to secure volume • We work with development of better and new supply channels for wood in the Nordic market including the Baltic region, to have a bigger harvesting area that we can source from • We have flexible wood transport to the site in Sarpsborg, by truck, railway and boat, gives no restrictions in supply, gives reduced logistic cost (logistic approx 30% of wood cost) • Engagement with policymakers for prioritization of investment in infrastructure for transport, lower transportation cost in the future, there is a ongoing project to build a wood terminal in the Gardermoen area, reduced cost in mid-term horizon • We are more flexible than other players in the wood processing industry when it comes to quality/freshness requirements of wood, can be old/dry and is not well suited for other wood processing • We make R&D investments to utilize more of the wood, 94% in 2021, and make higher value-added products (1600 NOK pr sm3 wood in 2021), further increasing its market position and competitiveness in the wood market Case study example: We have identified a need for an increased area for pulp storage at our operations in Sarpsborg. This will enable us to purchase more wood at a fortunate price, thus a way to mitigate the risk of increased wood cost. By 2022/23, we will increase the storage by 30.000 solid m3, an increase of 45% and 10days of operation. Investment in storage area is expected to be approx 15 MNOK. In the business case we have calculated a reduction in wood cost of 80 NOK pr s fm3. Borregaards cost to the response for mitigating the risk of increased cost of wood in 2021: The position as Director Wood sourcing, responsible for strategy and risk response activities above, one extra manning, one FTE. 1 FTE=NOK 1 mill. Cost of wood certification (PEFC/FCS) =NOK 0,1 mill

Comment
To minimise the impact from felling and forestry operations, Borregaard attaches significant importance to sourcing wood from forests that are certified and managed in a proper, sustainable, and eco-friendly manner, including measures to maintain biodiversity. We ensure that our suppliers comply with the applicable certification schemes, laws, and regulations in the countries where the wood is sourced. Borregaard will continue to develop wood supply logistics in the Nordic market and the Baltic Sea region in order to expand the sourcing area and lower the landed cost of wood. There are few transportation restrictions to the biorefinery in Sarpsborg, and wood can be transported by road, rail or sea. When possible, we will prioritise rail before road for transportation of wood. Borregaard's production units outside Norway receive lignin raw material from adjacent pulp mills which source FSC/ PEFC certified or controlled wood. Borregaard's use of certified wood implies that we do not purchase: • Illegally harvested wood • Wood harvested in violation of traditional and human rights • Wood from forests in which high conservation values are threatened by management activities • Wood from forests being converted to plantations or non-forest use; and • Wood from forests in which genetically modified trees are planted

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Opp1

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Products and services

Primary climate-related opportunity driver
Shift in consumer preferences

Primary potential financial impact
Increased revenues resulting from increased production capacity

Company-specific description
Borregaard has produced vanillin from wood since 1962 in its biorefinery in Sarpsborg. The product has historically sold at a price close to synthetic vanillin. During the last few years, the price and demand has increased substantially, in line with the change in customers preferences for natural and sustainable raw materials. The unique selling points for vanillin is now focused around three key factors: 1. Natural raw material, the product is made from wood (Norway spruce). The wood used to produce vanillin are all sourced from certified forests. 2. Biovanillin from Borregaard is documented as sustainable. An LCA (Life cycle analysis) has been conducted for vanillin produced at Borregaard and is documenting 90% lower CO2 footprint compared to oil-based vanillin. 3. Unique flavour, the product has subtle but important flavour differences versus other types of vanillin. Biobased vanillin is a low emission product produced at Borregaard in Sarpsborg and can document 90% lower CO2 footprint compared to oil-based vanillin, shown in its published environmental product data sheet (EPD). "Clean label" is a trend that has been driving the food market in recent years. The consumer wants to buy food with natural and sustainable raw materials, presented on the ingredients label in a way that is easy understandable. Food producers and their suppliers, like the flavour and fragrance industry are therefore working to eliminate synthetic ingredients made from oil and replace it with renewable bio-based alternatives. 90% of the global production of the vanilla flavour (vanillin) is synthetic, made from mineral oil. The consumer would prefer to have natural vanilla flavour from the vanilla bean, but this only accounts for less than 1% of the global production of vanillin. To significantly increase the production of vanilla beans has proven to be extremely difficult and is not likely to

happen in the foreseeable future. The second-best alternative to vanilla beans is vanillin made from natural and sustainable raw materials like wood, rice or other plants. With the positive trend as outlined above, the board of directors decided in mid 2019 to expand the capacity of wood-based vanillin with 250 MT up to a total capacity of 1500 MT/year at the site in Sarpsborg, Norway. Total investment is NOK 130 mill and will be completed in 2022. As of end of 2021, the production is increasing in line with expectations and totalled 1348 MT in 2021, up from 1250 MT in 2020.

Time horizon
Short-term

Likelihood
Likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
20000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The figure is calculated based on these assumptions: 1. The 250 MT increased production volume will be phased into the market gradually, in line with actual increased demand from existing and new customers. 2. The relevant global market segment is estimated to be around 2300 MT in 2021. 3. We expect the demand in this market segment to grow with 5% pr year on average from 2021 to 2025. This will give a total demand increase of around 500 MT by 2025. 4. As the major player in this segment, Borregaard expects to get around 50% of the 500 MT demand increase, i.e. the increased demand will absorb the 250 MT capacity increase by 2025 5. Contribution margin pr kg is expected to be around 90 NOK 6. We expect fixed costs to increase with around NOK 3 mill pr year Calculation of the potential financial impact figure: 1. Increase is contribution margin: 90 NOK/kg x 250 MT = NOK 23 mill 2. Increased fixed costs: NOK 3 mill 3. Net financial impact with effect from 2025: NOK 23 mill – NOK 3 mill = NOK 20 mill

Cost to realize opportunity
142000000

Strategy to realize opportunity and explanation of cost calculation
The market opportunity described above, triggered the following actions to realize the project and this opportunity: 1. Preparation of the business case and investment proposal for the capacity expansion of 250 MT biovanillin. 2. Approval of the investments by the board of directors (mid 2019) 3. Executing the capacity expansion. The key to realize this 250 MT vanillin opportunity is to remove some critical bottlenecks in production of biobased vanillin. This includes putting up a new line for crystallization (duplicating the existing one), introducing more buffer tanks, installing a new packaging line and improve the handling and capacity of side products and effluents. 4. Completion of the capacity expansion by end of 2021. 5. Gradually phase in the new capacity to the market from 2021 to 2025 Case study example: By the end of 2021, the project was broadly on track on cost, time, and performance. Production increased in 2021 to 1348 MT, up from 1250 in 2020. At the end of 2021, the production run rate was in line with the 1500 MT annual target. One of the key technical components, the salt removing unit, is delayed, and expected to be in operation by 1H 2022, but we still expect to reach the 1500 MT annual target for 2022. In 2021 the sales volume for Biovanillin increased by more than 200 MT, well above our expectations. This was mainly due to a temporary vanillin shortage, expected to normalize during 2022. The calculation of the cost to realize this opportunity consists of the following main components and assumptions: 1. Investments to remove bottlenecks: NOK 130 mill. 2. Fixed cost increase from 2021 to 2024: NOK 3 mill pr year x 4 years = NOK 12 mill Cost to realise the opportunity: Total costs: NOK 130 mill (Investment to remove bottleneck) + NOK 12 mill (Fixed cost increase from 2021 to 2024) = NOK 142 mill

Comment

Identifier
Opp2

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Products and services

Primary climate-related opportunity driver
Development of new products or services through R&D and innovation

Primary potential financial impact
Increased revenues through access to new and emerging markets

Company-specific description
Borregaard R&D has during 2019-2022 developed a unique and green chemistry platform for the production of lignin-based biopolymers. These products can replace oil-based polymers in markets where sustainable alternatives do not currently exist, such as detergents, pesticides and water purification. A preliminary Life Cycle Analysis shows that 3 kg CO2 equivalents per kg can be reduced by replacing fossil products. Example: Assuming a sales volume of 5,500 tonnes of lignin per year, after 5 years of full-scale construction operations and 1: 1 replacement of polycarboxylates, will result in a saving of 18,000 tonnes of CO2 equivalents / year. The project and technology will directly contribute positively to several of the UN's sustainability goals (SDG). This includes the development of sustainable water purification technologies and detergents that can help SDG 6: ensure accessibility and sustainable management of water and sanitation for all. The technology will offer a green chemistry platform that converts lignin to a variety of products that can replace petrochemicals and contributes to SDG 12: ensuring sustainable consumption and production patterns. The technology has great flexibility with regard to both the choice of lignin raw material, and different product types that can be produced. In addition to offering a number of new biopolymers, the technology will also be able to replace existing modification technologies that are dependent on the use of undesirable chemicals such as formaldehyde. The technology is based upon green chemistry to modify the lignin structure so that the biopolymer can be modified in countless ways without introducing fossil carbon. The platform is therefore close to an ideal green chemistry process and the development of the technology has now come so far that it is ready for upscaling to a pilot scale.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
85000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The figure is calculated based on these assumptions: 1. The financial impact figure is calculated from a business case based on prototypes that have shown promising properties in applications dominated by a petrochemical polycarboxylate called polyacrylate, including water purification, detergents and other areas such as paint and agriculture. Current lignin biopolymers have varying performance within these applications, so these markets represent a large untapped growth potential for the new products. 2. The relevant global market is estimated as today's marked volume for polyacrylate, which is is 350000 MT. For new applications such as detergents, we expect lower immediate market access, but with higher growth as the total potential is large. 5 years after full implementation of a full-scale plant we expect to have a market share of 1,6%, 5500 MT. 3. The business case is based a cost of NOK 150 mill for a full scale plant and a pilot of NOK 65 mill = NOK 215 mill. Borregaards minimum requirement for return of invested capital (discounting rate) is 15 %. 4. We expect fixed costs to increase with approximately NOK 20 mill pr year 5. Contribution margin pr kg is expected to be around 19 NOK/kg, which is average across several industrial applications areas. 6. The milestone for the conclusion of the technology is set to Nov 2025, thus 5 years after full implementation is 2030. Calculation of the potential financial impact figure: 1. Contribution margin: 19 NOK/kg x 5500 MT = NOK 105 mill 2. Increased fixed costs: NOK 20 mill 3. Net financial impact with effect from 2030: NOK 105 mill – NOK 20 mill = NOK 85 mill

Cost to realize opportunity
215000000

Strategy to realize opportunity and explanation of cost calculation
The market opportunity described in the columns above, triggers the following actions to realize the project: 1. R&D activities together with relevant customers to develop the technology in lab scale have been conducted. 2. Developed business case to calculate the market potential, the cost of the pilot plant and a cost of a full scale production plant 3. The expected start of construction for the pilot plant is in 2023 and the construction process is expected to take approximately 1 year. 4. The pilot plant is expected to be operational in early 2024. It is expected that it will be necessary to adjust the process along the way and possible conversions must be expected. 5. 2025/2026, the process will be optimized and test volumes of prototypes will be produced for customer tests. 6. The milestone for the conclusion of the technology is set to Nov 2025. Case study example: The development of a new modification technology at Borregaard R&D has now come so far that it is ready for upscaling to a pilot scale. The goal of the pilot is to demonstrate that the technology can be scaled up and for the production of test volumes for verification at the end customer. The pilot project will be completed in the period 2023-2025. The overall goal of the entire development program is to establish profitable full-scale production of bio-based chemicals, 5500 tons to the market after 5 years of operation of the full-scale plant. The technology is currently assessed at technology readiness level (TRL) level 5 and the goal of the pilot project is to bring the TRL level to 8. The calculation of the cost to realize this opportunity consists of the following main components and assumptions: The cost has been calculated by Borregaard project department from the business case. The investment cost includes necessary equipment, pipes, controls and building to produce the anticipated volumes in the pilot phase and in the full scale plant. Cost for operating of the plant like chemicals, utilities and full time employees (FTE's) have been included. 1. Costs related to the construction of the pilot plant NOK 50 mill 2. Start-up and operation of pilot plants NOK 15 mill 3. Cost for construction and operation of the full scale plant = 150 NOK mill. Cost to realise the opportunity: Total costs: NOK 50 mill + NOK 15 mill + 150 NOK mill = NOK 215 mill

Comment

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan

Yes, we have a transition plan which aligns with a 1.5°C world

Publicly available transition plan

Yes

Mechanism by which feedback is collected from shareholders on your transition plan

We have a different feedback mechanism in place

Description of feedback mechanism

Borregaard has an active and open communication with the financial market. The annual and quarterly reports contain information on the various aspects of the company's activities, including the content and progress of Borregaards climate transition plan. The quarterly presentations are published at Borregaard's website. All shareholders and other financial market players are treated equally as regards access to financial information. The Group's Investor Relations Department maintains regular contact with shareholders, potential investors, analysts and other financial market stakeholders. Borregaard adheres to the Oslo Stock Exchange recommendation on reporting of relevant information to the investor community. The financial calendar for is published at Borregaard's website and at Oslo Stock Exchange. Investor presentations and meetings, including quarterly presentations (on webcast). The shareholders can provide feedback on the contents and progress of our climate transition plan through dialogue with The Group's Investor Relations Department. Total number of shareholders was 7,846, but the 20 largest shareholders owned 70% of the shares. The Board has been put together with the aim of safeguarding the interests of the shareholder community and the company's need for competence, capacity and diversity. The Board consists of the Chair, six members and two observers. The employees have elected two members and two observers. The composition of the Board meets statutory requirements and the Code of Practice. All shareholder-elected members are independent of the company's management, main shareholders and important business associates. Thus the Board it selves can represent a feedback mechanism. The Board considers climate-related issues when reviewing and guiding strategy, risk management policies, annual budgets, and business plans, as well as setting Borregaard's performance objectives. Progress on climate-related goals and targets are overseen and monitored, the Board sets the overall climate-related goals for the company and oversee major capital expenditures, acquisitions and divestitures, and climate-related risks have been considered in the process. Attached documents: General presentation, slide 12, Quarterly investor communication , slide 21 Webcast link: https://events.webcast.no/borregaard-1/quarterly-reports/7MpZFYIW04TWbz8JtUCX

Frequency of feedback collection

More frequently than annually

Attach any relevant documents which detail your transition plan (optional)

Borregaard Quarterly investor communication 4th-quarter-2021.pdf
Borregaard General presentation february-2022.pdf
TCFD Report Borregaard Group 2021.pdf

Explain why your organization does not have a transition plan that aligns with a 1.5°C world and any plans to develop one in the future

<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy

<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios: IEA NZE 2050	Company-wide	<Not Applicable>	IEA Scenarios pathways from the IEA Nordic Technology Perspectives 2016 are used for the trajectory on Nordic production of electricity and district heating and cooling. The Nordic emission factors for energy follows the trajectory towards carbon neutrality in 2050, or about 10 grams CO2e per kWh set for Borregaard in the Nordic region. This transition from low fossil fuel use today, towards extremely low to no fossil fuel is relevant for Borregaard SBTs. This time horizon is relevant to us where the SBTs are set at base-year 2009 with a 53% reduction by 2030 and a 100% reduction by 2050. A macro-economic factor that can have material impact on Borregaard's business performance comprise the fluctuating power market. An assumption in this scenario is that the need for renewable electrical power will increase, both for Borregaard and many other industries (increased transition cost). Power production in Norway is dominated by hydropower, and wind power is an increasing contributor. Precipitation, wind and temperature are therefore important drivers for the electricity price, and consequently important cost factors for Borregaard. Risk from exposure to annual fluctuations in the aforementioned factors is mitigated by entering long term renewable power purchase agreements (PPAs). The time horizon for PPAs is typically up to 12 years at Borregaard. A higher degree of electrification of the energy consumption at the biorefinery in Norway is necessary to meet our SBTi climate targets. To mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption. Framework conditions for energy and climate matters are changing rapidly. We expect policy changes, promoting the transition to a carbon-neutral society. Borregaard monitors and engages actively, e.g. in the development of the European Green Deal, in cooperation with European and national industry associations. Both the grid and the capacity for production of electricity need to be increased, this was one of the conclusions from the initiative of Process21. Process21 has given strategic advice and recommendations to the government and other actors on how to combine sustainable growth and reduce emissions from the process industry.
Physical climate scenarios: RCP 8.5	Company-wide	<Not Applicable>	The qualitative and quantitative analysis of the 4ºC by 2100 Business as Usual scenario is dominated by increasing physical risks, due to a lack of coordinated policy actions to limit climate change. In this scenario, economic growth is preferred over climate action and overconsumption of resources continues. The world is still dependent on fossil fuels and energy intensity continues to be high. The growth of GHGE will cause further macro-economic consequences and an increase of global warming and long-lasting changes in all components of the climate system and irreversible impacts for people and ecosystems. Water becomes a key resource with limited availability and climate-related conflicts increase in number because of poor agriculture and living conditions. Flooding, heavy precipitation and sea level rise could impact Borregaard's operations and value chain. The ambition for economic growth is not met, as GDP losses occur due to increased physical risks as the temperatures rise. Impacts from climate change-related extreme events are projected to increase further with warming. Impacts from climate change-related extreme events are projected to increase further with warming. Increased urban flood damage from extreme precipitation is a key climate-related risk in most world regions, including in Europe. Increased drought stress and associated water restrictions and wildfires are expected in southern Europe, Australia, and parts of Africa, Asia, and North America. Global mean sea level will continue to rise during the 21st century. Norway is less vulnerable to climate change than most other countries, and one of the countries with greatest adaptive capacity. Norway has the lowest score on the ND-GAIN Index which ranks 181 countries using a score which calculates a country's vulnerability to climate change and other global challenges as well as their readiness to improve resilience. The less vulnerable a country is, the lower their score is, while the more resilient a country is the higher the score will be. Norway is ranked 1st due to better functioning institutions, a higher level of education and a more diversified business sector. Higher income levels and flexible labor markets also give greater capacity to absorb the costs of a transition to a low-emission society.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

Borregaard had the following focal questions for its climate scenario analysis based on our previous understanding of the risk exposure for our operations: 1. Are there other physical changes due to climate change that could impact Borregaard? 2. How are Borregaard affected of new and more stringent climate regulations and policy changes? The rational for selecting the scenarios was to address these focal questions. The quantitative physical risk scenario assessments were designed to better understand what effects a base case and a worst case climate scenario would have upon Borregaard. In line with the Paris Agreement and the TCFD's recommendations, we have used public scenarios from the IEA and IPCC to assess possible outcomes based on a temperature increase of 2 or 4°C respectively. IEA SDS from the IEA Nordic Technology Perspectives 2016 are used for the trajectory on Nordic production of electricity and district heating and cooling. RCP 8.5 high emissions was chosen as a worst case scenario as though it is unlikely manmade emissions will follow this trajectory it is possible that the climate system will respond faster than expected and that natural carbon sinks may transition to sources increasing emissions. These two scenarios would then give useful information on how severe the climate effects could be in the future and allow consideration of if current infrastructure and mitigation measures are sufficient.

Results of the climate-related scenario analysis with respect to the focal questions

1. The trend towards a wetter, wilder and milder climate may have bearing on the cost of electrical power for operations in Norway. The Nordic power system is, however, closely interlinked with the power markets in continental Europe. It is well established that these connections enable the short run marginal cost of coal and gas fired power plants in Europe and have significant impact on the marginal power price in the Nordic market. The Paris Agreement and the UN Climate Panel have defined specific sustainability goals and measures within areas such as access to raw materials, energy, food and infrastructure. These initiatives are expected to increase demand for sustainable products and will present climate-related opportunities for Borregaard's innovative solutions in terms of creating good lives within a sustainable framework. Our goal is to provide sustainable solutions and products based on renewable raw materials. An example of this is our production and innovation to replace oil-based alternatives. Utilising the different components of wood, we produce lignin-based biopolymers and biovanillin, speciality cellulose, cellulose fibrils and bioethanol for a variety of applications in sectors such as agriculture and aquaculture, construction, pharmaceuticals and cosmetics and biofuels. Preliminary analyses suggest that rainfall intensity for durations of a few hours may increase by more than 30%. In river systems dominated by snowmelt-floods, a reduction of up to 50% is expected in spring floods. In river systems that are dominated by rain floods, the magnitude of floods is projected to increase by up to almost 60%. For inland waterways, more frequent high-water levels are expected by 2050, especially during winter. Further, the Sarpsborg site itself is exposed to landslides, as much of Sarpsborg is built on areas that were historically seabed. An increased number of shipments from sourcing locations to the Sarpsborg site, could potentially impact operational costs if not alternative transportation routes are used during these periods. 2. We expect policy changes and Borregaard monitors and engages actively, e.g. in the development of the European Green Deal, in cooperation with European and national industry associations. Both the grid and the capacity for production of electricity need to be increased, this was one of the conclusions from the initiative of Process21, a forum that has been established by the Norwegian government. The increasing need for renewable electricity in society could represent a challenge when it comes to replacing fossil-based energy sources. In 2021 59% of our energy was from renewable sources and we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption. Process21 has given strategic advice and recommendations to the government and other actors on how to combine sustainable growth and reduce emissions from the process industry.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	How the strategy has been influenced: One urgent challenge the world is currently facing is climate change. The Paris Agreement and the UN Climate Panel have defined specific sustainability goals and measures within areas such as access to raw materials, energy, food and infrastructure. These initiatives are expected to increase demand for sustainable products and will present climate-related opportunities for Borregaard's innovative solutions in terms of creating good lives within a sustainable framework. There is an increasing demand for sustainable products and solutions from renewable raw materials in the world, due to that the markets demand products with low CO2 footprints. Borregaard's goal is to provide sustainable solutions and products based on renewable raw materials, now Borregaard has defined clear strategic priorities to develop Borregaard into an even more specialised company to deliver even better sustainable solutions and products for the customers. The strategy has been to develop new products and solution through innovation and invest in production of new sustainable products. Short-term time horizon: The implementation of the investment strategy started in 2015 and the time horizon for the ongoing activities is the strategic period ending in 2025. It is likely that this strategy will continue. The most substantive strategic decision: Borregaard has invested close to NOK two billion in the period 2015-2021 in various strategic projects to increase top-line growth of sustainable low- emission products and solutions, a new biopolymer plant in Florida, the upgrade and specialisation of the biopolymer operation in Norway, the cellulose fibrils plant, the development and investment of the Ice Bear technology and the upgrade of the bioethanol plant are the most prominent expansion project in this period. In 2019 Borregaard decided to invest NOK 250 mill in response to growing demand for bio-vanillin, another low-emission product. Now we are in the execution phase of the strategy. For the biopolymers the goal is to increase sales of high value products through focused innovation work and to grow volume by attracting new customers within new applications. Introduction of Cellulose fibrils as a new business area and the introduction of the Exilva® MFC to the market as a new type of bio-based additive, reducing the CO2 footprint.
Supply chain and/or value chain	Yes	How the strategy has been influenced. The Intergovernmental Panel on Climate Change (IPCC) provides a clear description of the world's challenges in its Special Report where it stresses the dramatic difference between an increase in the global average temperature to 2°C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5°C above preindustrial levels. This has influenced the Borregaards strategy for CO2 emissions in the value chain. Borregaard has indirect CO2 emissions, such as emissions associated with transport of goods and production of raw materials, activities upstream or downstream in the value chain. In 2019 The Science Based Target initiative (SBTi) approved Borregaards well below 2oC target for reduction in indirect (scope3) greenhouse gas emissions. Now Borregaard has committed to 1.5oC target; •2030: Reduction in line with updated near-term science-based target, 25% absolute reduction from a 2020 base year • 2050: Reduction in line with updated long-term net-zero science-based target, 90% absolute reduction from a 2020 base year Long-term time horizon : The time horizon is the Science based targets in 2030 and 2050. The most substantive strategic decision: In 2018 Borregaard committed to SBTi and a well below 2oC target was approved by SBTi in 2019. Due to the latest IPPC report Borregaard has in 2021 committed to 1.5oC target. Borregaard aims to reduce the environmental impact from the value chain. The Group has set up an interdisciplinary long-term task force, "Borregaard Emission Free Transport 2020-2050", aiming to implement alternatives for more environmentally friendly transport solutions in the short- medium and long-term. A broader and more focused approach to sustainable transport lead to changes already in 2020. Borregaard has increased its fleet of electric vehicles (EV) for local transport and has installed a number of EV charging stations at the company's site in Norway to reduce CO2 emissions associated with employees' vehicle use. The task force reports progress to Borregaard's Sustainability Board.
Investment in R&D	Yes	How the strategy has been influenced. One urgent challenge the world is currently facing is climate change. The Paris Agreement and the UN Climate Panel have defined specific sustainability goals and measures within areas such as access to raw materials, energy, food and infrastructure. These initiatives are expected to increase demand for sustainable products and will present climate-related opportunities for Borregaard's innovative solutions in terms of creating good lives within a sustainable framework. There is an increasing demand for sustainable products and solutions from renewable raw materials in the world, due to that the markets demand products with low CO2 footprints. Borregaard's goal is to provide sustainable solutions and products based on renewable raw materials, now Borregaard has defined clear strategic priorities to develop Borregaard into an even more specialised company to deliver even better sustainable solutions and products for the customers. The strategy has been to develop new products and solution through innovation and investment in production of new sustainable products. Investment in R&D are important for renewing and strengthening Borregaard's operations and products and are also necessary to maintain the company's financial and environmental sustainability. Short-term time horizon: Implementation of the investment strategy started more than 15 years ago. The time horizon for the strategic period is 2025. Borregaard's experience is that it can take many years to develop a product, the development of cellulose fibrils, Exilva® MFC, started in 2005. The most substantive strategic decision: Borregaard has decided to have a high share of the company's revenue from R&D. Borregaard's R&D and innovation efforts in 2021 amounted to NOK 173 million. This represents 3.0% of the company's revenues. The development of new bio-based products continued and the innovation rate for 2021 was 13.7%. Since Borregaard's products are part of the future demand for climate friendly products, Borregaard receives external funding: In 2021, Borregaard recognised NOK 30 million in support for ongoing R&D projects, mainly from the EU's Horizon 2020 programme, the Research Council of Norway, Innovation Norway and Skattefunn.
Operations	Yes	How the strategy has been influenced. IPCC provides a clear description of the world's challenges in its Special Report where it stresses the dramatic difference between an increase in the global average temperature to 2°C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5°C above preindustrial levels. Borregaard has CO2 emission from the energy consumption in its operation and Borregaard has committed to reduce its energy consumption and increase the use of more renewable energy resources by doing investments in its energy supply chain to take action and contribute to solve the global challenges described in the IPCC report. Long-term time horizon : The strategy of reduction started 16 years ago and the time horizon is the Science based target in 2030 and 2050 . The most substantive strategic decision: In 2019, the Science Based Targets Initiative (SBTi) approved our well-below 2°C temperature increase target. We are now in the process of revising this target to a 1.5°C temperature increase in line with the SBTi's Business Ambition for 1,5°C. Our updated near-term target and the net-zero target will be approved by SBTi in 2022. We will reduce Scope 1 and 2 emissions by 42 % by 2030 and by 90 % by 2050 from a 2020 base year. The main source for the scope 1 and 2 CO2 emission in Borregaard, are the energy consumption of the operation. Borregaard has made a strategy on how to reduce the CO2 emissions, and put the projects and plans into the financial planning for the next strategic period. In the period 2020-2030 the strategy is to achieve the target by investment in technologies that can use more renewable heat energy. Examples of such initiatives: • Energy efficiency in production processes • Utilize more surplus heat from low-temperature heat sources. • Replacing oil heating at the Sarpsborg city with district heating supplied from residual energy from our site • Implement plans to increase the use of hydropower to produce steam in our electro boilers. During 2021, we have progressed our long-term action plan to achieve the science-based targets for 2030 and 2050, and we have formally applied for additional power grid capacity which will be key to reaching our long-term targets. The Borregaard Group has reduced its scope 1 and scope 2 emissions by 27 % since 2009, at a Capex of > NOK 250 mill.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Indirect costs Capital expenditures Access to capital Assets	How financial planning of Capital Expenditure has been influenced The increased demand for sustainable low-emission products due to the goals of the Paris Agreement and UN climate Panel, has influenced the capital expenditure. Borregaard has invested close to NOK two billion in the period 2015-2020 in various strategic projects to increase top-line growth of sustainable low-emission products and solutions. The time horizon for the planning is the short-term strategic period that ends in 2025. Case Study Capital Expenditure The financial targets for Capital Expenditure in Borregaard is that the return on capital employed (ROCE) must be above 15% pre-tax over a business cycle (6-7 years). The Board of Directors in Borregaard decided in 2019 to expand the capacity of low CO2 emission product bio-vanillin with 250 MT up to a total capacity of 1500 MT/year at the site in Sarpsborg, Norway. Total investment was NOK 130 mill and was completed in 2021.The increased production volume will be phased in gradually to existing and new customers. The actual price level and time to phase in the volume will depend on volume expansion from competitors and also how fast the demand actually will be growing. We expect global capacity for this segment to be in line with/slightly above the demand in the years to come and prices to be around today's level. With these assumptions we expect to achieve minimum 15% return on the investment of NOK 130 mill. The EBITDA impact at the end of the short-term period (2025) will be minimum 20 mill NOK, mainly driven by increased contribution margin of 23 mill NOK, partly offset by an increase in fixed costs of 3 mill NOK How financial planning of indirect cost (operating cost) has been influenced Borregaard in Sarpsborg is a significant consumer of electrical power. Power production in Norway is dominated by hydropower, and wind power is an increasing contributor. Precipitation, wind and temperature are therefore important price drivers for the electricity price, and consequently important cost factors for Borregaard in Norway. The trend towards wetter, wilder and milder climate may have bearing on the cost of electrical power for operations in Norway. The Nordic power system is, however, closely interlinked with the power markets in continental Europe. It is well established that these connections enable the short run marginal cost (SRMC) of coal and gas fired power plants in Europe, especially Germany, to have significant impact on the marginal power price in the Nordic market. Included in the SRMC for coal and gas for power production is the cost of CO2-allowances under the EU-ETS. Both fuel cost and CO2-price therefore have an impact on the power price in Norway and represents a significant financial risk as long as these fossil-based power plants set the market price on the margin. In autumn 2021 it was increasing power prices in Europe and in Norway. Borregaard in Sarpsborg can switch the variable load for heat energy between electrical power and liquid natural gas. The use of LNG for variable load in our biorefinery, is reasonable as we can utilise this energy source with a very high degree of efficiency. Even though this prioritisation resulted in higher direct emissions and EU ETS costs for Borregaard in 2021, it was a sound environmental decision from a systems perspective. The use of electricity for heating purposes in these strained periods, could result in higher overall direct emissions in Europe, as this would incentivise power production with lower energy efficiency and higher emission intensity. The efficient allocation of resources is an important motivation for the market-based EU ETS. Risk from exposure to yearly fluctuations in the aforementioned factors is mitigated by entering long term renewable power purchase agreements. The time horizon for the power purchase is agreements (PPAs) is up to 12 years, i.e. 2033 (medium-term). For the years 2021, 2027 and 2033, Borregaard has secured 600 GWh, 480 GWh and 175 GWh in total PPA volumes, respectively. How financial planning of access to capital has been influenced The opportunity of more favourable margins for Borregaard's loans, has influenced our strategy to reduce emissions. In the bilateral multicurrency revolving credit facility agreements we have with three Nordic banks, DNB Bank ASA, Skandinaviska Enskilda Banken AB and Branch of Svenska Handelsbanken AB, our margins are linked to the Group's overall climate target. The facilities, amount in total to NOK 1,500 million. We also see possibilities in getting more financing from innovation funds, private and debt equity as well as government subsidies that have been allocated to assist in the transition to low-carbon technologies. The European Commission has unveiled its new Climate, Energy and Environment Aid Guidelines (CEEAG), which detail how member countries can support companies in the transition to a low-carbon economy. The medium-term time horizon of the credit facility is 2021 to 2030. How financial planning of Assets has been influenced In the financial planning process climate risks of damage of Borregaard's fixed assets due to increased risk of physical climate changes incidents like flooding, mudslides, heavy rain and storms has been included in the insurance process. Borregaard has together with its insurance company mapped how potential physical incidents may impact the areas the company operates in. Preventive/risk reducing activities are implemented. Magnitude of impact: NATCAT exposure (natural catastrophes) are fully covered under PD/BI (Property Damage and Business Interruption Coverage). The time horizon is medium-term - 2030.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's transition to a 1.5°C world?

Yes

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's transition to a 1.5°C world.

Financial Metric
CAPEX

Percentage share of selected financial metric aligned with a 1.5°C world in the reporting year (%)
15

Percentage share of selected financial metric planned to align with a 1.5°C world in 2025 (%)
50

Percentage share of selected financial metric planned to align with a 1.5°C world in 2030 (%)
20

Describe the methodology used to identify spending/revenue that is aligned with a 1.5°C world
Criteria: Borregaard are now in the process of revising our existing science based target approved in 2019 to a 1.5°C temperature increase in line with Science Based Targets initiative's Business Ambition for 1.5°C campaign following the IPPC's Sixth Assessment report. Our new target guides and set the emission reduction criteria to determine the alignment of the spending with Borregaards transition to a business model compatible with a 1.5°C world. Borregaard commits to reach net-zero greenhouse gas emission across the value chain by 2050 from a 2020 base year. Borregaard commits to reduce absolute scope 1 and 2 GHG emissions with 42 % by 2030 and with 90% by 2050 from a 2020 base year. Borregaard also commits to reduce absolute scope 3 GHG emissions by 25 % in 2030 and by 90% by 2050 from a 2020 base year. To reach the SBT target the spending must meet the criteria of reducing the the scope 1 and 2 emissions xx tons from 2020 to 2030 and with xx tons from 2030 to 2050 and the scope 3 emission with xx tons from 2020 to 2030 and with xx tons from 2030 to 2050. Example Activity 1 86 % of Borregaards scope 1 and 2 emissions stems from production of energy to meet the demand of heat energy at Borrregaards site in Norway. Energy efficiency is the backbone of our climate gas emission reduction strategy, because increase efficiency will reduce the need for fossil energy. In 2021 activities within low temperature heat recovery from the processes have been implemented. In Norway the electricity comes from renewable sources like hydropower and wind. The fastest road to reduce the fossil emissions from our site in Norway and the key to reaching our long-term targets, is electrification of the steam production and energy supply. In 2021, we have formally applied Elvia, the grid owner, for additional power grid capacity and in addition we have started a study on how to increase our own internal grid capacity. We have investigated the cost for installation of electro boilers, how we can electrify drying processes and how we can increase the use of energy from internal bioenergy sources, like bark. Thus we have progressed in our long-term action plan towards 2030 both in which activities that must be installed, the CO2 reduction pr activity, the investment costs and the timeframe for the different activities. Example Activity 2 Development in technologies for Carbon Capture and Storage (CCS) or sustainable Carbon Capture and Use (CCU) may be a prerequisite to achieving the SBT target in 2050 for scope 1 and 2 emissions. Borregaard has joined a cluster of companies in establishing CCUS Norway, a non-commercial and science-based organisation that serves as a knowledge-sharing network. Members from academia, the industry and technology developers come together to share knowledge and experience on environmental and resource efficient carbon capture and storage or usage (CCUS). In our 1.5°C plan, CCS will probably be introduced in the period 2030 to 2040, the CAPEX pr ton CO2 is higher pr ton CO2 than the measures in the CAPEX plan between 2021 and 2030. Estimated changes in spending: Borregaards spending that is aligned with a 1.5°C world was 15 % of the total CAPEX in 2021 (about 80 mill NOK out of 540 mill NOK in investment cost 2021). To reach our 2030 target on time we have to do a major part of the investment in the years 2024-2026, based on the knowledge we have from the Capex plan to align with the 1.5°C, we estimate that the Capex will be 50% of total Capex. In 2030 the major part of the investment will have been taken, but there will still be necessary to do investment both in emission reduction and energy efficiency, thus we estimate that the CAPEX will be about 20 % of the total Capex. Total Capex in Borregaard is divided in to parts, replacement investments which is about 350 mill NOK annually and expansion investments that can vary.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?
Absolute target
Intensity target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number
Abs 1

Year target was set
2016

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Base year
2009

Base year Scope 1 emissions covered by target (metric tons CO2e)
224998

Base year Scope 2 emissions covered by target (metric tons CO2e)

73345

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
298343

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
75.4

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
24.6

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2030

Targeted reduction from base year (%)
53

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
140221.21

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
153285

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
64818

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
218103

% of target achieved relative to base year [auto-calculated]
50.7456941892702

Target status in reporting year
Underway

Is this a science-based target?
Yes, and this target has been approved by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
The GHG reduction target is a science-based target approved by the SBTi and aligned with a well-below 2oC pathway. The target is an absolute target, where 100 % of emissions in scope 1 and 2 is covered. This is the mid-term target ending in 2030, which is between 2021 and 2036. The average annual reduction of scope 1 and 2 emissions is 4.2% from the base year 2009.

Plan for achieving target, and progress made to the end of the reporting year
PLAN - THE WAY FORWARD Going forward, we will continue navigating the energy crisis while pursuing efforts in emission reductions according to the climate and energy strategy and our science-based target. In 2021, we increased our ambitions for our 2030 and 2050 climate targets from a well-below 2°C target to a 1.5°C target. In 2022, we will design an investment programme according to the new target. A higher degree of electrification of the energy consumption at the biorefinery in Norway – directly or indirectly – will be necessary to meet our climate targets. In order to mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption. This will benefit both Borregaard and the energy system as such. PROGRESS The Borregaard Group has reduced its scope 1 and scope 2 emissions by 27 % since 2009. Greenhouse gas emissions (scope 1 and scope 2) increased by 11% in the Group compared with 2020. The main reasons for the higher GHG emissions are high spot prices for alternative energy sources, increased use of LNG due to increased powder production in the new spray driers, higher energy consumption due to increased specialisation and a cold winter. In the face of increasing power prices in Europe, the use of LNG for variable load in our biorefinery is reasonable as we can utilise this energy source with a very high degree of efficiency. Even though this prioritisation resulted in higher direct emissions and EU ETS costs for Borregaard in 2021, it was a sound environmental decision from a systems perspective. The use of electricity for heating purposes in these strained periods, could result in higher overall direct emissions in Europe, as this would incentivise power production with lower energy efficiency and higher emission intensity. The efficient allocation of resources is an important motivation for the market-based EU ETS.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Abs 2

Year target was set
2016

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Base year
2009

Base year Scope 1 emissions covered by target (metric tons CO2e)
224998

Base year Scope 2 emissions covered by target (metric tons CO2e)
73345

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
298343

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
75.4

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
24.6

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2050

Targeted reduction from base year (%)
100

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
0

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
153285

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
64818

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
218103

% of target achieved relative to base year [auto-calculated]
26.8952179203132

Target status in reporting year
Underway

Is this a science-based target?
Yes, and this target has been approved by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
The GHG reduction target is a science-based target approved by the SBTi and aligned with a well-below 2oC pathway. The target is an absolute target, where 100 % of emissions in scope 1 and 2 is covered. This is the long-term target ending in 2050, which is after 2036. The average annual reduction of scope 1 and 2 emissions is 2,2 % from the base year 2009.

Plan for achieving target, and progress made to the end of the reporting year
PLAN Going forward, Borregaard will continue navigating the energy crisis while pursuing efforts in emission reductions according to the climate and energy strategy and our science-based target. In 2021, we increased our ambitions for our 2030 and 2050 climate targets from a well-below 2°C target to a 1.5°C target. In 2022, we will design an investment programme according to the new target. A higher degree of electrification of the energy consumption at the biorefinery in Norway – directly or indirectly – will be necessary to meet our climate targets. In order to mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard’s energy system and facilitate flexibility in our electricity consumption. This will benefit both Borregaard and the energy system as such. Energy efficiency is the backbone of Borregaard's climate strategy. We receive support for energy efficiency measures from various government support schemes such as Enova, to meet the needs of a low-emission society. Development in technologies for Carbon Capture and Storage (CCS) or sustainable Carbon Capture and Use (CCU) may be a prerequisite to achieving the target in 2050. Borregaard has joined a cluster of companies in establishing CCUS Norway, a non-commercial and science-based organisation that serves as a knowledge-sharing network. Members from academia, the industry and technology developers come together to share knowledge and experience on environmental and resource efficient carbon capture and storage or usage (CCUS). PROGRESS The Borregaard Group has reduced its scope 1 and scope 2 emissions by 27 % since 2009.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Abs 3

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Base year
2020

Base year Scope 1 emissions covered by target (metric tons CO2e)
130945

Base year Scope 2 emissions covered by target (metric tons CO2e)
65414

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
196359

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
67

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
33

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2030

Targeted reduction from base year (%)
42

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
113888.22

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
153285

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
64818

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
218103

% of target achieved relative to base year [auto-calculated]
-26.3657018885962

Target status in reporting year
New

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
1.5°C aligned

Please explain target coverage and identify any exclusions
The GHG reduction target is a science-based target and aligned with 1.5oC pathway. The target is currently being reviewed by Science Based Target initiative. The target is an absolute target, where 100 % of emissions in scope 1 and 2 is covered. This is a near-term target ending in 2030.

Plan for achieving target, and progress made to the end of the reporting year
PLAN We will be navigating the energy crisis while pursuing efforts in emission reductions according to the climate and energy strategy and our science-based target. In 2021, we increased our ambitions for our 2030 and 2050 climate targets from a well-below 2°C target to a 1.5°C target. In 2022, we will design an investment programme according to the new target. A higher degree of electrification of the energy consumption at the biorefinery in Norway – directly or indirectly – will be necessary to meet our climate targets. In order to mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption. This will benefit both Borregaard and the energy system as such. Energy efficiency is the backbone of our climate strategy. We receive support for energy efficiency measures from various government support schemes such as Enova, to meet the needs of a low-emission society. Development in technologies for Carbon Capture and Storage (CCS) or sustainable Carbon Capture and Use (CCU) may be a prerequisite to achieving the target in 2050. Borregaard has joined a cluster of companies in establishing CCUS Norway, a non-commercial and science-based organisation that serves as a knowledge-sharing network. Members from academia, the industry and technology developers come together to share knowledge and experience on environmental and resource efficient CCUS PROGRESS Scope 1 and 2 increased by 11% in the Group compared with 2020. The main reasons for the higher GHG

emissions are high spot prices for alternative energy sources, increased use of LNG due to increased powder production in the new spray driers, higher energy consumption due to increased specialisation and a cold winter. In the face of increasing power prices in Europe, the use of LNG for variable load in our biorefinery is reasonable as we can utilise this energy source with a very high degree of efficiency. Even though this prioritisation resulted in higher direct emissions and EU ETS costs for Borregaard in 2021, it was a sound environmental decision from a systems perspective. The use of electricity for heating purposes in these strained periods, could result in higher overall direct emissions in Europe, as this would incentivise power production with lower energy efficiency and higher emission intensity.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Abs 4

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Base year
2020

Base year Scope 1 emissions covered by target (metric tons CO2e)
130945

Base year Scope 2 emissions covered by target (metric tons CO2e)
65414

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
196359

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
67

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
33

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2050

Targeted reduction from base year (%)
0

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
196359

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
153285

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
64818

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
218103

% of target achieved relative to base year [auto-calculated]
<Not Applicable>

Target status in reporting year
New

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
1.5°C aligned

Please explain target coverage and identify any exclusions
The GHG reduction target is a science-based target are aligned with 1.5oC pathway (the target is currently being reviewed by Science Based Target initiative). The target is an absolute target, where 100 % of emissions in scope 1 and 2 is covered. This is the long-term target ending in 2050 (>8 years).

Plan for achieving target, and progress made to the end of the reporting year
PLAN We will be navigating the energy crisis while pursuing efforts in emission reductions according to the climate and energy strategy and our science-based target. In 2021, we increased our ambitions for our 2030 and 2050 climate targets from a well-below 2°C target to a 1.5°C target. In 2022, we will design an investment programme according to the new target. A higher degree of electrification of the energy consumption at the biorefinery in Norway – directly or indirectly – will be necessary to meet our climate targets. In order to mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption. This will benefit both Borregaard and the energy system as such. Energy efficiency is the backbone of our climate strategy. We receive support for energy efficiency measures from various government support schemes such as Enova, to meet the needs of a low-emission society. Development in technologies for Carbon Capture and Storage (CCS) or sustainable Carbon Capture and Use (CCU) may be a prerequisite to achieving the target in 2050. Borregaard has joined a cluster of companies in establishing CCUS Norway, a non-commercial and science-based organisation that serves as a knowledge-sharing network. Members from academia, the industry and technology developers come together to share knowledge and experience on environmental and resource efficient CCUS PROGRESS Scope 1 and 2 increased by 11% in the Group compared with 2020. The main reasons for the higher GHG emissions are high spot prices for alternative energy sources, increased use of LNG due to increased powder production in the new spray driers, higher energy consumption due to increased specialisation and a cold winter. In the face of increasing power prices in Europe, the use of LNG for variable load in our biorefinery is reasonable as we can utilise this energy source with a very high degree of efficiency. Even though this prioritisation resulted in higher direct emissions and EU ETS costs for Borregaard in 2021, it was a sound environmental decision from a systems perspective. The use of electricity for heating purposes in these strained periods, could result in higher overall direct emissions in Europe, as this would incentivise power production with lower energy efficiency and higher emission intensity.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Abs 5

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 3

Scope 2 accounting method
<Not Applicable>

Scope 3 category(ies)
Category 1: Purchased goods and services
Category 2: Capital goods
Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 8: Upstream leased assets
Category 9: Downstream transportation and distribution
Category 10: Processing of sold products
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 14: Franchises
Category 15: Investments
Other (upstream)
Other (downstream)

Base year
2020

Base year Scope 1 emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 2 emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3 emissions covered by target (metric tons CO2e)
399998

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
399998

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
<Not Applicable>

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
<Not Applicable>

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
100

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2030

Targeted reduction from base year (%)
25

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
299998.5

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
364245

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
364245

% of target achieved relative to base year [auto-calculated]
35.7531787658938

Target status in reporting year
New

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
1.5°C aligned

Please explain target coverage and identify any exclusions
The GHG reduction target is a science-based target currently being reviewed the SBTi, and are aligned with 1.5 °C. The target is an absolute target. 100 % of emissions in all of the scope 3 categories is covered. This is the near-term target ending in 2030.

Plan for achieving target, and progress made to the end of the reporting year
PLAN - HOW WE WORK / THE WAY FORWARD When purchasing goods and services, we aim to make the supply chain as sustainable as possible. We actively communicate our expectations and requirements to our partners, and we collect information from our suppliers about their emissions as part of our decision-making process. We assess the suppliers on efficiency, price, quality, service levels, as well as social and environmental issues. Our established strategy is to conduct sustainable purchasing, where social, ethical, and environmental aspects are integrated into and attached great importance in the procurement process. With customers in more than a hundred different countries, our products are distributed around the world. Being a buyer of transport services, Borregaard can contribute to climate friendly transport as transportation is an area where low emissions, carbon neutrality and emission free solutions are gaining traction. Initiatives related to transportation continues to be driven and tracked by the interdisciplinary long-term task force, Borregaard Emission Free Transport 2020-2050, which reports to Borregaard's Sustainability Board. The task force will establish KPIs for emissions related to transportation based on the available CO2 emission factors per MOT. Furthermore, the aim is to include emission criteria in our tendering processes. Going forward, our most effective way to improve sustainable sourcing will be to engage with ambitious suppliers, request documentation of actual progress and include CO2 emissions as criteria in the supplier selection process. In future reporting, we will include the percentage of suppliers with significant actual and potential environmental impact with identified targeted improvements. PROGRESS New target. In 2021, we improved our data collection for Mode of Transportation (MOT) and calculated CO2 emission factors for each mode. This enables a structured and fact-based approach on initiatives for reduced carbon emissions in transport going forward. The emission factors will be updated on an annual basis to reflect the rapid development towards a greener logistics industry.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Abs 6

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 3

Scope 2 accounting method
<Not Applicable>

Scope 3 category(ies)
Category 1: Purchased goods and services
Category 2: Capital goods
Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 8: Upstream leased assets
Category 9: Downstream transportation and distribution
Category 10: Processing of sold products
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 14: Franchises
Category 15: Investments
Other (upstream)
Other (downstream)

Base year
2020

Base year Scope 1 emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 2 emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3 emissions covered by target (metric tons CO2e)
399998

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
399998

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
<Not Applicable>

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
<Not Applicable>

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
100

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2050

Targeted reduction from base year (%)
90

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
39999.8

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
364245

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
364245

% of target achieved relative to base year [auto-calculated]
9.93143854608162

Target status in reporting year
New

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
1.5°C aligned

Please explain target coverage and identify any exclusions
The GHG reduction target is a science-based target approved by the SBTi, and are aligned with 1.5oC pathway. The target is an absolute target, where 100 % of emissions in scope 1 and 2 is covered. This is the long-term target ending in 2050 (>8years).

Plan for achieving target, and progress made to the end of the reporting year
PLAN - HOW WE WORK / THE WAY FORWARD When purchasing goods and services, we aim to make the supply chain as sustainable as possible. We actively communicate our expectations and requirements to our partners, and we collect information from our suppliers about their emissions as part of our decision-making process. We assess the suppliers on efficiency, price, quality, service levels, as well as social and environmental issues. Our established strategy is to conduct sustainable purchasing, where social, ethical, and environmental aspects are integrated into and attached great importance in the procurement process. With customers in more than a hundred different countries, our products are distributed around the world. Being a buyer of transport services, Borregaard can contribute to climate friendly transport as transportation is an area where low emissions, carbon neutrality and emission free solutions are gaining traction. Initiatives related to transportation continues to be driven and tracked by the interdisciplinary long-term task force, Borregaard Emission Free Transport 2020-2050, which reports to Borregaard's Sustainability Board. The task force will establish KPIs for emissions related to transportation based on the available CO2 emission factors per MOT. Furthermore, the aim is to include emission criteria in our tendering processes. Going forward, our most effective way to improve sustainable sourcing will be to engage with ambitious suppliers, request documentation of actual progress and include CO2 emissions as criteria in the supplier selection process. In future reporting, we will include the percentage of suppliers with significant actual and potential environmental impact with identified targeted improvements. PROGRESS New target. In 2021, we improved our data collection for Mode of Transportation (MOT) and calculated CO2 emission factors for each mode. This enables a structured and fact-based approach on initiatives for reduced carbon emissions in transport going forward. The emission factors will be updated on an annual basis to reflect the rapid development towards a greener logistics industry.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Year target was set
2017

Target coverage
Site/facility

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Intensity metric
Metric tons CO2e per megawatt hour (MWh)

Base year
2009

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)
0.141

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)
0.031

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)
0.172

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure
97

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure
65

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure
<Not Applicable>

% of total base year emissions in all selected Scopes covered by this intensity figure
89

Target year
2025

Targeted reduction from base year (%)
41.86

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]
0.1000008

% change anticipated in absolute Scope 1+2 emissions
39

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)
0.088

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)
0.03

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)
0.118

% of target achieved relative to base year [auto-calculated]
75.0008333425927

Target status in reporting year
Underway

Is this a science-based target?
No, but we are reporting another target that is science-based

Target ambition
<Not Applicable>

Please explain target coverage and identify any exclusions
Target coverage: Borregaard Sarpsborg (Norway) scope1+scope2. This is a mid-term target ending in 2025 (8 years).

Plan for achieving target, and progress made to the end of the reporting year
PLAN Going forward, we will continue navigating the energy crisis while pursuing efforts in emission reductions according to the climate and energy strategy and our science-based target. In 2021, we increased our ambitions for our 2030 and 2050 climate targets from a well-below 2°C target to a 1.5°C target. In 2022, we will design an investment programme according to the target. A higher degree of electrification of the energy consumption at the biorefinery in Norway – directly or indirectly – will be necessary to meet our climate targets. In order to mitigate the exposure to higher electricity prices and tariffs following higher electricity consumption, we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption. This will benefit both Borregaard and the energy

system as such. PROGRESS Borregaard Sarpsborg has reduced its emission intensity figure "direct and indirect GHG emission per energy consumption" by 31 % since 2016.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Net-zero target(s)

C4.2c

(C4.2c) Provide details of your net-zero target(s).

Target reference number
NZ1

Target coverage
Company-wide

Absolute/intensity emission target(s) linked to this net-zero target
Abs1

Target year for achieving net zero
2050

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Please explain target coverage and identify any exclusions
The target is an absolute target, where 100 % of emissions in Scope 1 and Scope 2 for Borregaard Group is covered. Our updated near-term target and the net-zero target will be approved by SBTi in 2022. We will reduce Scope 1 and 2 emissions by 42 % by 2030 and by 90 % by 2050 from a 2020 base year. The indirect Scope 3 emissions will be reduced by 25 % by 2030 and by 90 % by 2050 from a 2020 base year

Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?
Yes

Planned milestones and/or near-term investments for neutralization at target year
It is still uncertain which mechanisms that are valid for neutralization at the target year. Borregaard monitors the regulatory development in carbon removal certificates valid for biogenic products and processes.

Planned actions to mitigate emissions beyond your value chain (optional)

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.
Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	11	150000
To be implemented*	4	1700
Implementation commenced*	8	10000
Implemented*	1	2000
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in production processes	Waste heat recovery

Estimated annual CO2e savings (metric tonnes CO2e)
2000

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
7500000

Investment required (unit currency – as specified in C0.4)
7019835

Payback period
<1 year

Estimated lifetime of the initiative
11-15 years

Comment

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Borregaard has established a Compliance Board consisting of the SVP Organisation and Public Affairs, General Counsel, Vice President Finance and CRO. The Compliance Board shall support the Group companies' management by raising awareness of compliance matters, reporting on its activity and findings and contributing to improvements. The Compliance Board reports to the President and CEO and the annual Compliance Report is reviewed by the Board of Directors. Borregaard complies with regulatory requirements and standards in the countries the company operates. When standards are announced to be changed Borregaard proactively develops plans on how to cope with the future requirements. Example: •A new Pulp and Paper BREF (Best available technology reference document) was published in 2014, and Borregaard's Sarpsborg site have a new permit from 2019 that also takes into account reduction in energy. •Complies with new changes in EU ETS period from 2021 to 2025, the Norwegian Environmental authorities has approved Borregaard's Sarpsborg site application for EU Climate Allowances for the new period. •New regulations within EU Green Deal are developing fast, one example of a new regulation is the EU taxonomy is a classification system, establishing a list of environmentally sustainable economic activities. This system is an important enabler to scale up sustainable investments and a tool to help navigate the transition to a low carbon, resilient and resource efficient economy for investors and companies. The specific guidelines and requirements for the taxonomy are still in the development phase and it is not clear how we w
Dedicated budget for other emissions reduction activities	In Borregaard overall Environment and climate policy, the environmental efforts from a sustainability perspective form the basis for work on emissions, energy use, water consumption as well as purchases of raw materials and other input factors: • Life cycle approach as basis for evaluation of measurements and priorities, both in innovation of new products and for improved impacts along the entire the value chain. • Establishment of goals, targets and actions for important environmental areas such as energy consumption, emissions, water consumption and waste reductions and enhancement of bio diversity. The company has certified environmental (ISO 14001) and energy management system (ISO 50001) for of its main operation at Borregaard's Sarpsborg site in Norway and for the operation in Germany, as a tool for a systematic implementation of the policy. Due to the certification the company is obliged to have a total list of emission reduction activities at the different production units that is prioritised in the regular maintenance and investment budget. To reach the target there is a yearly dedicated budget for Capex and Opex related to emission reduction activities. For the short-term period (2021-2025), Capex related to emission reduction according to the science-based target plan is identified, informed to and approved by the Board of Directors.
Financial optimization calculations	Borregaard Sarpsborg has established an Energy and Climate committee which monthly assesses energy cost, including the carbon price. The carbon price is a factor which influence the energy price, and this is used for energy mix decisions, in short-term and long-term perspective. It is also used to make prognosis for future energy cost and it is used in projects to calculate the effect of investments. Borregaard uses the energy price model to make prognoses for how changes in cost of EU climate allowances and other factors will influence the energy cost. In 2021 the CO2 price has increased, and it is expected to increase further as supported by the result from our climate scenario analysis. The model for the energy cost is used in projects and are used for calculating the financial impact of the CO2 emission reduction projects in line with Borregaard's Science Based Target commitment. Energy cost will decrease by avoiding emissions and making the right decisions in choice of energy source for projects (steam source) and the degree of heat recovery. This will have an impact on the financial results and is a driver in investment projects.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?
Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation
Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon
The EU Taxonomy for environmentally sustainable economic activities

Type of product(s) or service(s)

Pulp and paper	Lignin extraction

Description of product(s) or service(s)
Innovation of new sustainable products is an important enabling activity in the Taxonomy's definition of the Manufacturing of low-carbon products– we employ its criteria on a set of biochemicals currently produced and sold by Borregaard, to classify the products as low-carbon technologies. Borregaard's lignin-based biopolymers are renewable, wood-based alternatives to fossil-based chemicals for use in a broad range of markets like concrete admixtures, gypsum board, ceramics, animal feed, agro chemicals, soil conditioner and batteries. About 60 % of the revenue from Borregaard's division, BioSolution, comes from lignin biopolymer chemicals that directly replace oil-based alternatives. Borregaard's lignin-based biopolymers have a 70 % lower CO2 footprint through the overall life cycle compared to a synthetic dispersant. Comparison has been carried out by the Norwegian Institute for Sustainability Research (Norsus) using life cycle analysis methodology according to the ISO-standards 14040/44. The model substance used is the synthetic dispersant, polycarboxylate.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Methodology for Environmental Life-Cycle Assessment of Information and Communication Technology Goods, Networks and Services (ITU-TL.1410)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Cradle-to-gate + end-of-life stage

Functional unit used
The functional unit used is the CO2 equivalent in kg from 1 kg of product (100% dry matter), kg CO2e/kg product

Reference product/service or baseline scenario used
As a reference product, the Oil-based polymer and dispersant, Polycarboxylate ether (PCE) is selected. The reason for selecting PCE is that it is used in construction, ceramics and refractories, which is similar applications that lignin biopolymers can be used in.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Cradle-to-gate + end-of-life stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
3

Explain your calculation of avoided emissions, including any assumptions
Borregaard has performed a life cycle analysis of our lignin-based biopolymers (LBB), where the goal is to quantify the environmental load connected to utilizing wood to produce speciality chemicals like our LBB. We are comparing the environmental performance to a Polycarboxylate ether dispersant based on a fossil raw material. The environmental performance of the LBB in a cradle to gate boundary (including end of life) is documented as environmental product declarations (EPDs) and in an extended report (Modahl and Soldal 2021) in 2021. Assumption for the service life is included in this calculation. To obtain data for Polycarboxlate (PCE), Ecoinvent 3 data and life cycle analysis methodology according to the ISO-standards 14040/44 have been used. PCE is selected as model chemical for the calculation as it represent at typical synthetic detergent that is in the same markets as most LBB's. The CO2e/kg product is calculated for 4 phases: 1. Cultivation This part is referring to how the raw materials are being produced. Bio-based material like wood will take up CO2 from the atmosphere during their growth, giving a negative CO2 emission in this phase. LBB = -2,39 kg CO2e/kg prod. Fossil material has a net zero during this step, PCE = 0 kg CO2e/kg prod. 2. Production phase This is referring to the process of extracting and refining the final product. This process is demanding resources and thereby contributing to a certain environmental load, for both the lignin-based and the polycarboxylate dispersant. Since Borregaard has worked with optimizing our production process with regards to reducing emissions, the CO2 emissions connected to produce 1 kg of LBB is more than 30 % lower than producing 1 kg of the PCE dispersant. 3. Service life phase This the time in which the products functionality is being utilized by our customer. In this period, we have considered no emissions connected to neither of the products. This means that by using a lignin-based dispersant, the CO2 footprint is actually negative during its service life. 4. End of life Calculation of the CO2 released to the atmosphere if both the lignin-based dispersant and the Synthetic dispersant is 100 % degraded. SUM LBB 1-4 =-2,39 + 1,83+0+1,87 =1,31 kg CO2e/kg prod SUM PCE 1-4 =0+ (1,83*1,30)+Y+Z =LBB + 3 kg CO2 e/kg prod Result: the avoided emission from using LBB is 3 kg lower CO2e/kg prod, which is a a 70 % lower CO2 footprint compared to PCE. Data for PCE is confidential.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
29

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
The EU Taxonomy for environmentally sustainable economic activities

Type of product(s) or service(s)

Biofuels	Bioethanol

Description of product(s) or service(s)
Borregaard produces second generation bioethanol at its production facilities in Sarpsborg. While first generation ethanol is based on feedstocks like corn, sugarcane, grain and sugar beets from farmland, our second generation (advanced) bioethanol is derived from residues or non-food crops grown on marginal land unsuitable for food production. The bioethanol is derived from Norway Spruce, as a by-product of our cellulose production. Most of the bioethanol produced at Borregaard in 2021 was used for biofuel. In Norway the minimum content of biofuel in fuel for road traffic was 24,5 % in 2021 in Norway. The renewable energy directive RED II require that member states must require fuel suppliers to supply a minimum of 14% of the energy consumed in road and rail transport by 2030 as renewable energy. A major part of the bioethanol produced at Borregaard is used for biofuel in the Norwegian and European market and the changes in the biofuel regulations will increase the demand for bioethanol from Borregaard. The bioethanol from Borregaard has low CO2 footprint compared to other biofuels, and because it is second generation (advanced) the bioethanol from Borregaard counts double in the mixing with fossil fuels. In 2018 Borregaard invested in upgrading of its bioethanol plant to produce qualities that could be used for biofuel. The production of bioethanol is certified according to ISCC EU, an International Sustainability and Carbon Certification for bioethanol.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Methodology for Environmental Life-Cycle Assessment of Information and Communication Technology Goods, Networks and Services (ITU-TL.1410)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Cradle-to-grave

Functional unit used
When ethanol is used as a driving fuel, drivers want to know how long they can go on a full tank and how large the environmental impacts are connected to the function they get, i.e. kilometres driven, gCO2e/km driven is selected as functional unit. The CO2 equivalents are the sum of the production of the fuel plus the direct emissions from fuel when driving.

Reference product/service or baseline scenario used
The reference product is fossil fuel gasoline, which has emissions of 180 g CO2 e/km. 45g CO2 e/km is from the production phase of gasoline and 135 g CO2e/km is from the direct emissions when driving. Compared with gasoline, Borregaards second-generation bioethanol has 86% lower greenhouse gas emissions, 25g CO2e/km. The reference used in this calculation is Baxter and Brekke (2016): Competitor product environmental analysis for Borregaard's products, AR.06.16, Fredrikstad: Ostfold Research.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Cradle-to-grave

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
155

Explain your calculation of avoided emissions, including any assumptions
The reference product is fossil fuel gasoline, which has emissions of 180 g CO2 e/km, 45g CO2e/km is from the production phase of gasoline and 135 g CO2e/km is from the direct emissions when driving. Compared with gasoline, Borregaards second-generation bioethanol has 86% lower greenhouse gas emissions, 25 g CO2e /km. The emissions from driving is 0 g CO2e/km, because the emissions is from biogenic carbon. . 1.Gasoline= 180 g CO2e/km 2.Bioetanol= 25 g CO2e/km Avoided emissions is 180 g CO2e/km- 25 g CO2e/km = 155 g CO2e/km bioethanol instead of gasoline Annual production volumes at Borregaard is 20 mill litres of bioethanol (99%), the major part of the bioethanol in 2021 was sold as biofuel. The density for bioethanol is 0,79 kg/l. 20 mill litres *0,79kg/litres = 15800 tonn/year.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
3

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
No

Name of organization(s) acquired, divested from, or merged with
<Not Applicable>

Details of structural change(s), including completion dates
<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	No	<Not Applicable>

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start
January 1 2009

Base year end
December 31 2009

Base year emissions (metric tons CO2e)
224998

Comment

Scope 2 (location-based)

Base year start
January 1 2009

Base year end
December 31 2009

Base year emissions (metric tons CO2e)
73345

Comment

Scope 2 (market-based)

Base year start
January 1 2009

Base year end
December 31 2009

Base year emissions (metric tons CO2e)
73345

Comment
Location-based result has been used as a proxy since a market-based result in base year cannot be calculated

Scope 3 category 1: Purchased goods and services

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
123178

Comment

Scope 3 category 2: Capital goods

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
2142

Comment

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
10331

Comment

Scope 3 category 4: Upstream transportation and distribution

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
13721

Comment

Scope 3 category 5: Waste generated in operations

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
2037

Comment

Scope 3 category 6: Business travel

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
588

Comment

Scope 3 category 7: Employee commuting

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
1131

Comment

Scope 3 category 8: Upstream leased assets

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
0

Comment

Scope 3 category 9: Downstream transportation and distribution

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
165330

Comment

Scope 3 category 10: Processing of sold products

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
56638

Comment

Scope 3 category 11: Use of sold products

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
0

Comment

Scope 3 category 12: End of life treatment of sold products

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
7482

Comment

Scope 3 category 13: Downstream leased assets

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
0

Comment

Scope 3 category 14: Franchises

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
0

Comment

Scope 3 category 15: Investments

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
17420

Comment

Scope 3: Other (upstream)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
0

Comment

Scope 3: Other (downstream)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
0

Comment

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
153285

Start date
January 1 2021

End date
December 31 2021

Comment

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)
130945

Start date
January 1 2020

End date
December 31 2020

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
64818

Scope 2, market-based (if applicable)
308291

Start date
January 1 2021

End date
December 31 2021

Comment

Past year 1

Scope 2, location-based
65414

Scope 2, market-based (if applicable)
336965

Start date
January 1 2020

End date
December 31 2020

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?
No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
135429

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
1

Please explain
Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO2, the IPCC 2013 GWP100a (incl. CO2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Activity data (primary data) obtained from Borregaard and one supplier. Secondary data obtained as cradle-to-gate emissions factors from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Capital goods

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1928

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO2, the IPCC 2013 GWP100a (incl. CO2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Activity data (primary data) obtained from Borregaard. Secondary data obtained as cradle-to-gate emissions factors from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
9750

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO2, the IPCC 2013 GWP100a (incl. CO2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Activity data (primary data) obtained from Borregaard. Secondary data for fuels obtained as cradle-to-gate emissions factors, not included in Scope 1 and 2, from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
10533

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Hybrid method. Assume that road transport is performed by lorry Euro V. This class is the most dominant in Norway (2016). For characterization of the GHG emissions and emissions of biogenic CO 2, the IPCC 2013 GWP100a (incl. CO 2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Activity data, transport mode and distances (primary data) obtained from Borregaard. Secondary data (emissions factors) obtained from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1937

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO2, the IPCC 2013 GWP100a (incl. CO2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Activity data (primary data) obtained from Borregaard. Secondary data obtained from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
136

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
35

Please explain
Information on air travel is a mix between information on distances and calculated CO 2/passenger km. Emissions factor for hotel night: 9.6 kg CO 2 -eq/night (Brekke et al. 2018). For characterization of the GHG emissions and emissions of biogenic CO 2, the IPCC 2013 GWP100a (incl. CO 2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Activity data (hotel nights and km travelled by each mode of transport) obtained from Borregaard. Emissions factors for air travels (secondary data) obtained from the publicly available emissions factors from (DEFRA, 2017) and from Brekke et al. (2018). For other modes of transport (road, rail), emissions factors are obtained from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Employee commuting

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1165

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Combination of distance from home of employees to Borregaard Sarpsborg and national statistics on work travel habits, were the basis for calculation of person km (pkm) travelled by different modes of transport: on feet (0 g CO 2 -eq/pkm), bike (1 1 g CO 2 -eq/pkm), car (273 g CO 2 -eq/pkm), bus (99,5 g CO 2 - eq/pkm), train (11 g CO 2 - eq/pkm), and air (121,8 g CO 2 - eq/pkm). For characterization of the GHG emissions and emissions of biogenic CO 2, the IPCC 2013 GWP100a (incl. CO 2 uptake), as implemented in SimaPro v. 9.2 has been used. Number of employees and postal address obtained from Borregaard. National statistics on work travel habits assumed to be relevant for Borregaard Norway (Epiniom 2019). Emissions factors for commuting by car, is based on the average Norwegian passenger car in 2018 (SSB, 2018). Emissions factors (secondary data) obtained from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Borregaard has no upstream leased assets.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
126369

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO2, the IPCC 2013 GWP100a (incl. CO2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Specific transport volumes and modes of transport given by Borregaard. Emissions factors (secondary data) obtained from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Processing of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
69598

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
For several of the products, there is no processing, or the processing is marginal. The two largest products are cellulose and lignin. Lignin is mostly used in construction, and energy consumed during mixing with cement is used. For cellulose, it is assumed that 1/4 of the sold cellulose goes into viscose production, half in China and half in Spain. For the rest, it is assumed that dispersing of cellulose consumes the same amount of energy as dispersing of microfibrillated cellulose. For mixing of fine chemicals, the energy used is obtained from Borregaard. Twigs are sold for fluting, ecoivent process for processing of wood chips to fluting is used for this amount. For characterization of the GHG emissions and emissions of biogenic CO 2, the IPCC 2013 GWP100a (incl. CO 2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Data on amount of sold products obtained from Borregaard. Emissions factors (secondary data) obtained from the commercially and publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Use of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
0

Emissions calculation methodology
Site-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
There are no direct emissions in the use phase of all products except ethanol, alvamix, twigs and bark which are combusted and lead to emissions ogf biogenig CO2. The amount of biogenic CO2 is calculated based on carbon content of the products multiplied with the molecular weigt ratio carbon to CO2. Data on amounts of sold products and carbon content obtained from Borregaard.

End of life treatment of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
7400

Emissions calculation methodology
Hybrid method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Due to biological origin, the sold products are assumed to not cause emissions of GHG in end-of-life treatment. Emissions of biogenic CO2 from end-of-life treatment calculated based on carbon content of sold products multiplied with the molecular weight ratio carbon to CO2. For characterization of the GHG emissions and emissions of biogenic CO2, the IPCC 2013 GWP100a (incl. CO2 uptake), v.1.0, as implemented in SimaPro v. 9.2 has been used. Specific information on carbon content and amount of sold products obtained from Borregaard. Sodium hypochlorite and hydrochloride acid are treated as hazardous waste at end of life. Data on the amount of sodium hypochlorite and hydrochloride acid are given by Borregaard. Emission factors (secondary data) obtained from the publicly available database ecoinvent ver. 3.7.1 (Wernet et al. 2016).

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Borregaard has no downstream leased assets.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Borregaard has no franchise activities.

Investments

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Borregaard has no investments activities at the moment (the interest in Umkomaas Ligning Ltd was ended in May 2020).

Other (upstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
No other upstream activities.

Other (downstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
No other downstream activities.

C6.5a

(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.

Past year 1

Start date
January 1 2020

End date
December 31 2020

Scope 3: Purchased goods and services (metric tons CO2e)
123178

Scope 3: Capital goods (metric tons CO2e)
2142

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
10331

Scope 3: Upstream transportation and distribution (metric tons CO2e)
13721

Scope 3: Waste generated in operations (metric tons CO2e)
2037

Scope 3: Business travel (metric tons CO2e)
588

Scope 3: Employee commuting (metric tons CO2e)
1131

Scope 3: Upstream leased assets (metric tons CO2e)
0

Scope 3: Downstream transportation and distribution (metric tons CO2e)
165330

Scope 3: Processing of sold products (metric tons CO2e)
56638

Scope 3: Use of sold products (metric tons CO2e)
0

Scope 3: End of life treatment of sold products (metric tons CO2e)
7482

Scope 3: Downstream leased assets (metric tons CO2e)
0

Scope 3: Franchises (metric tons CO2e)
0

Scope 3: Investments (metric tons CO2e)
17420

Scope 3: Other (upstream) (metric tons CO2e)
0

Scope 3: Other (downstream) (metric tons CO2e)
0

Comment
GHG protocol Scope 3 reporting Borregaard 2020. Updated analysis. The inventory data has not changed, except for Category 10 Processing of sold products where data on mass going to fluting has been included. The analysis has been performed with updated database for background data and method. In category 3, a new modelling of electricity has been applied for a better inclusion of Scope 3 emissions from electricity.

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	150748	Direct CO2 emissions from biogenic carbon

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure
3757

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
218103

Metric denominator
unit total revenue

Metric denominator: Unit total
5805000000

Scope 2 figure used
Location-based

% change from previous year
1.9

Direction of change
Increased

Reason for change
Greenhouse gas emissions (scope 1 and scope 2) increased by 11% in the Group compared with 2020. The main reasons for the higher GHG emissions are high spot prices for alternative energy sources, increased use of LNG due to increased powder production in the new spray driers, higher energy consumption due to increased specialisation and a cold winter. In the face of increasing power prices in Europe, the use of LNG for variable load in our biorefinery is reasonable as we can utilise this energy source with a very high degree of efficiency. Even though this prioritisation resulted in higher direct emissions and EU ETS costs for Borregaard in 2021, it was a sound environmental decision from a systems perspective. The use of electricity for heating purposes in these strained periods, could result in higher overall direct emissions in Europe, as this would incentivise power production with lower energy efficiency and higher emission intensity. The efficient allocation of resources is an important motivation for the market-based EU ETS. Total CO2 emissions increased by 21745tCO2 in 2021 (11.1 %). The total revenue increased with 9.0 % from 2020 to 2021. Borregaard's operating revenues increased to NOK 5,805million (5,328 million) in 2021. BioSolutions had a significantly improved result compared with 2020, whereas BioMaterials and Fine Chemicals had slightly weaker results.

Intensity figure
0.1152

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
218103

Metric denominator
megawatt hour transmitted (MWh)

Metric denominator: Unit total
1893947

Scope 2 figure used
Location-based

% change from previous year
7.6

Direction of change
Increased

Reason for change
The main reason for change in CO2 emission was emission reduction activities in more renewable energy in the operation of the energy boilers at the production site in Norway. The main reason for the reduction was increased use of electricity from the grid used for variable load steam energy production, this resulted om reduced consumption of Liquid Natural Gas for steam production. It is possible to influence the renewable part of the energy mix, by switching the operation between some of the boilers for the variable load steam production. This work is within the responsibility of the Energy and Climate committee. Key Performance Indicators for carbon intensity and energy cost are monitored, to make the decisions on the energy mix, our CO2 price (calculated from EU Allowances) is included in the calculation. An implemented project resulted in a reduction of 100 tCO2 in 2020 (full effect from October 2020, but will have an estimated annual savings 1200tCO2 from 2021). Total CO2 emissions was reduced by 7383 tCO2 in 2020 (-3,6 %). The energy consumption increased with 2,3 % from 2019 to 2020, due to increased production volume of speciality cellulose (4,2%).

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?
Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	152898	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	387	IPCC Fifth Assessment Report (AR5 – 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United Kingdom of Great Britain and Northern Ireland	56
Czechia	0
Germany	2628
United States of America	11571
Norway	139030

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Borregaard UK	56	53.431999	-2.518186
Borregaard Czech	0	49.717969	18.294605
Borregaard Deutschland	2628	49.04618	8.3127
Borregaard USA	2498	44.89155	-89.623801
Lignotech Florida	9073	30.660132	-81.475858
Borregaard Norway	139030	59.277403	11.115526
Lignotech Ibérica	0	43.348202	-4.046235

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	153285	<Not Applicable>	
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
United Kingdom of Great Britain and Northern Ireland	6	9
Spain	0	0
Czechia	93	112
Germany	1354	2304
United States of America	15204	15523
Norway	48162	290343

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By facility

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Borregaard UK	6	9
Lignotech Ibérica	0	0
Borregaard Czech	93	112
Borregaard Deutschland	1354	2304
Borregaard USA	10579	10886
LignoTech Florida	4625	4637
Borregaard Norway	48162	290343

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	64818	308291	
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C-CH7.8

(C-CH7.8) Disclose the percentage of your organization's Scope 3, Category 1 emissions by purchased chemical feedstock.

Purchased feedstock	Percentage of Scope 3, Category 1 tCO2e from purchased feedstock	Explain calculation methodology
Solid biomass	0	Solid biomass = wood. Borregaards biorefinery uses raw materials which meet environmental and sustainability criteria.

C-CH7.8a

(C-CH7.8a) Disclose sales of products that are greenhouse gases.

	Sales, metric tons	Comment
Carbon dioxide (CO2)	0	We do not sell any products that are greenhouse gases.
Methane (CH4)	0	We do not sell any products that are greenhouse gases.
Nitrous oxide (N2O)	0	We do not sell any products that are greenhouse gases.
Hydrofluorocarbons (HFC)	0	We do not sell any products that are greenhouse gases.
Perfluorocarbons (PFC)	0	We do not sell any products that are greenhouse gases.
Sulphur hexafluoride (SF6)	0	We do not sell any products that are greenhouse gases.
Nitrogen trifluoride (NF3)	0	We do not sell any products that are greenhouse gases.

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	10600	Increased	5.4	The total renewable energy consumption decreased by 53 GWh in 2021 (1125GWh-1178GWh). The energy mix for peak load steam production at the production site in Sarpsborg, changed in the direction of more LNG (scope1) and less electricity from the grid to the electro boilers (scope 2). Decreased renewable energy consumption due to increased LNG consumption. Change in emission calculated as increased LNG consumption: 53GWh*200 tCO2/GWh(LNG)= +10600 tCO2. Previous year scope1+2 emissions: 196359 tCO2. Emissions value,%: (+10600tCO2/196359tCO2)*100= +5,4% (i.e. a 5,4 % increase in emissions)
Other emissions reduction activities	1600	Decreased	0.8	Implementation 2021, CO2 savings: In 2020, a project "steam converter SO2 " was implemented in week 42. Total estimated annual energy savings is 20 GWh. Energy savings 2020=4GWh, Energy savings 2021 = 20GWh-4GWh= 16GWh => 16GWh*200tCO2/GWh(LNG)*0.5 = -1600CO2e Previous year scope1+2 emissions: 196359 tCO2. Emissions value: (-1600tCO2/196359 tCO2) *100= -0,8% (i.e. a 0.8% decrease in emissions)
Divestment	0	No change	0	Not applicable
Acquisitions	0	No change	0	Not applicable
Mergers	0	No change	0	Not applicable
Change in output	0	No change	0	Not applicable
Change in methodology	2400	Decreased	1.2	Scope 1 (Process emissions): Decrease due to updated limestone emission factor. Limestone 2021: 9200tCO2(w/2021 factor), 9400tCO2(w/2020 factor). 9200tCO2-9400tCO2= -200 tCO2 Scope 2 (electricity and purchased steam): Decrease due to updated emission factors scope 2 (location-based) . Scope 2 2021: 64800tCO2 (w/2021 factors), 67000tCO2 (w/ 2020 factors). (64800tCO2-67000tCO2) = -2200tCO2. Previous year scope1+2 emissions: 196359 tCO2 Change in emissions scope1+2 (decrease): -200tCO2-2200tCO2= -2400 tCO2. Emissions value: (-2400tCO2/196359 tCO2)*100=-1,2%. (i.e. a 1.2% decrease in emissions)
Change in boundary	0	No change	0	Not applicable
Change in physical operating conditions	0	No change	0	Not applicable
Unidentified	3144	Increased	1.6	Unidentified change in emissions: 218103tCO2(2021) - [196359tCO2(2020) + 10600 tCO2(decreased renewable)- 1600tCO2(red.activities)-2400tCO2(methodology)+ 12000(other)]= 218103tCO2 - 214959tCO2= 3144 tCO2 Previous year scope1+2 emissions: 196359 tCO2 Emissions value: 3144tCO2/196359 tCO2*100=1,6% (i.e. a 1.6% increase in emissions)
Other	12000	Increased	6.1	1)The new biopolymer plant in Florida (2018) increased its powder production in 2021 which led to higher direct GHG emissions, 2000 tCO2 (scope1). 2) Increased energy consumption of 17GWh from spray drying due to increased biopolymer powder production in 2021 (scope 1 Norway+Germany). 17GWh*200tCO2/GWh(LNG)=3400tCO2 3) Increased energy consumption of 33GWh. Higher energy consumption due to increased specialisation and a cold winter. 33GWh*200tCO2/GWh(LNG)=6600tCO2 Previous year scope1+2 emissions: 196359 tCO2 Change in emissions scope1 (increase): 2000tCO2+3400tCO2+6600tCO2=12000tCO2. Emissions value: (12000tCO2/196359tCO2)*100= 6,1%. (i.e. a 6.1% increase in emissions)

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 10% but less than or equal to 15%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	363899	674460	1038359
Consumption of purchased or acquired electricity	<Not Applicable>	606540	43922	650462
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	154547	92353	246900
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	1124986	810735	1935721

C-CH8.2a

(C-CH8.2a) Report your organization's energy consumption totals (excluding feedstocks) for chemical production activities in MWh.

Consumption of fuel (excluding feedstocks)

Heating value

LHV (lower heating value)

MWh consumed from renewable sources inside chemical sector boundary

363899

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

674460

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

1038359

Consumption of purchased or acquired electricity

Heating value

<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary

606540

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

43922

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

650462

Consumption of purchased or acquired steam

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
154547

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
92353

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
246900

Consumption of self-generated non-fuel renewable energy

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
0

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
0

Total energy consumption

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
1124986

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
810735

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
1935721

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value
LHV

Total fuel MWh consumed by the organization
248496

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
49592

MWh fuel consumed for self-generation of steam
198904

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Sustainable biomass = Biogass and Alvamix (Liquor from alkaline pulping/bleaching). EU-ETS. Borregaards operation in Norway is within the EU-ETS system, and holds a permit for climate gas emissions from Norwegian Environment Agency. In the permit emission factors for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Other biomass

Heating value
LHV

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Not applicable

Other renewable fuels (e.g. renewable hydrogen)

Heating value
LHV

Total fuel MWh consumed by the organization
221930

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
221930

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Waste incineration

Coal

Heating value
LHV

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Not applicable

Oil

Heating value
LHV

Total fuel MWh consumed by the organization
18653

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
14371

MWh fuel consumed for self-generation of steam
4282

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
light fuel oil, diesel

Gas

Heating value
LHV

Total fuel MWh consumed by the organization
507506

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
183648

MWh fuel consumed for self-generation of steam
323858

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
LNG (liquid natural gas) and NG (natural gas)

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value
LHV

Total fuel MWh consumed by the organization
41774

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
41774

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Sulfur (S)

Total fuel

Heating value
LHV

Total fuel MWh consumed by the organization
1038359

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
247611

MWh fuel consumed for self-generation of steam
790748

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	0	0	0	0
Heat	247611	247611	49592	49592
Steam	790748	790748	314308	314308
Cooling	0	0	0	0

C-CH8.2d

(C-CH8.2d) Provide details on electricity, heat, steam, and cooling your organization has generated and consumed for chemical production activities.

Electricity

Total gross generation inside chemicals sector boundary (MWh)
0

Generation that is consumed inside chemicals sector boundary (MWh)
0

Generation from renewable sources inside chemical sector boundary (MWh)
0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
0

Heat

Total gross generation inside chemicals sector boundary (MWh)
247611

Generation that is consumed inside chemicals sector boundary (MWh)
247611

Generation from renewable sources inside chemical sector boundary (MWh)
49592

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
49592

Steam

Total gross generation inside chemicals sector boundary (MWh)
790748

Generation that is consumed inside chemicals sector boundary (MWh)
790748

Generation from renewable sources inside chemical sector boundary (MWh)
314308

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
314308

Cooling

Total gross generation inside chemicals sector boundary (MWh)
0

Generation that is consumed inside chemicals sector boundary (MWh)
0

Generation from renewable sources inside chemical sector boundary (MWh)
0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method
Purchase from an on-site installation owned by a third party

Energy carrier
Steam

Low-carbon technology type
Sustainable biomass

Country/area of low-carbon energy consumption
Czechia

Tracking instrument used
Contract

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
260

Country/area of origin (generation) of the low-carbon energy or energy attribute
Czechia

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2003

Comment
The plant in Czechia was acquired by Borregaard in the end of 2003.

Sourcing method
Purchase from an on-site installation owned by a third party

Energy carrier
Steam

Low-carbon technology type
Sustainable biomass

Country/area of low-carbon energy consumption
Germany

Tracking instrument used
Contract

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
7826

Country/area of origin (generation) of the low-carbon energy or energy attribute
Germany

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
1990

Comment
The plant in Germany was acquired by Borregaard in 1990.

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area
Norway

Consumption of electricity (MWh)
617808

Consumption of heat, steam, and cooling (MWh)
180188

Total non-fuel energy consumption (MWh) [Auto-calculated]
797996

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
United Kingdom of Great Britain and Northern Ireland

Consumption of electricity (MWh)
28

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
28

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Czechia

Consumption of electricity (MWh)
210

Consumption of heat, steam, and cooling (MWh)
260

Total non-fuel energy consumption (MWh) [Auto-calculated]
470

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Germany

Consumption of electricity (MWh)
3912

Consumption of heat, steam, and cooling (MWh)
7826

Total non-fuel energy consumption (MWh) [Auto-calculated]
11738

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
United States of America

Consumption of electricity (MWh)
28503

Consumption of heat, steam, and cooling (MWh)
58625

Total non-fuel energy consumption (MWh) [Auto-calculated]
87128

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

C-CH8.3

(C-CH8.3) Does your organization consume fuels as feedstocks for chemical production activities?
Yes

C-CH8.3a

(C-CH8.3a) Disclose details on your organization's consumption of fuels as feedstocks for chemical production activities.

Fuels used as feedstocks
Solid biofuels

Total consumption
397695

Total consumption unit
metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit
0

Heating value of feedstock, MWh per consumption unit
4.1

Heating value
HHV

Comment
Wood

Fuels used as feedstocks
Liquid biofuel

Total consumption
186882

Total consumption unit
metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit
0

Heating value of feedstock, MWh per consumption unit
5

Heating value
LHV

Comment
lignin raw material

C-CH8.3b

(C-CH8.3b) State the percentage, by mass, of primary resource from which your chemical feedstocks derive.

	Percentage of total chemical feedstock (%)
Oil	0
Natural Gas	0
Coal	0
Biomass	100
Waste (non-biomass)	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	0
Unknown source or unable to disaggregate	0

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C-CH9.3a

(C-CH9.3a) Provide details on your organization's chemical products.

Output product
Specialty chemicals

Production (metric tons)
151661

Capacity (metric tons)
165000

Direct emissions intensity (metric tons CO2e per metric ton of product)
0.6

Electricity intensity (MWh per metric ton of product)
1.1

Steam intensity (MWh per metric ton of product)
4.2

Steam/ heat recovered (MWh per metric ton of product)
0.23

Comment
Speciality cellulose

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

C-CH9.6a

(C-CH9.6a) Provide details of your organization's investments in low-carbon R&D for chemical production activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Bio technology	Applied research and development	81 - 100%	173000000	Borregaard owns and operates the world's most advanced biorefinery. By using natural, sustainable raw materials from certified and sustainable wood, the company produces advanced and environmentally friendly biochemicals, biomaterials and bioethanol that can replace oil-based products. Biorefineries using certified and sustainable wood, is a according to the framework, "Climate Bonds Taxonomy", page 12 a Low-carbon product or service. Long-standing research and development has resulted in solutions that respond to important long-term global challenges. To maintain its position as the world's most advanced biorefinery, Borregaard is dependent on developing the biorefinery concept by finding new bio-based raw materials, as well as new products and markets for bio-based chemicals and materials with the highest value and best environmental profile. Borregaard invests significant resources each year in this area. The innovation success of Borregaard is a result of in-house R&D and of the fact that we work closely with the sales force, the production staff, the customers and external institutes and universities. High ambitions in product development have led to a significant number of new products and new areas of application for our existing products. Borregaard spend around 220 million NOK annually on research and development; this is an effort that has gained recognition and support from the European Union, Innovation Norway and the Norwegian Research Council. Borregaard's R&D and innovation efforts in 2021 amounted to NOK 173 million. This represents 3% of the company's revenues. The total investment in R&D are 100 % within the definition for low-carbon products and service. Investment in R&D low-carbon product and service/Total investment in R&D: 2019 = 200 mill NOK/ 200 mill NOK 2020 = 193 mill NOK/ 193 mill NOK 2021 = 173 mill NOK/ 173 mill NOK Average % of total R&D investment over the last 3 years = 100%

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
EY verification letter 2021 Scope 1, Scope 2 and selected Scope 3_220614.pdf

Page/ section reference
Page 1 and 2

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Reasonable assurance

Attach the statement
Borregaard_EUETS_p4_AER_2021_verification_report_approved.pdf

Page/ section reference
Page 1-9

Relevant standard
European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)
90

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
EY verification letter 2021 Scope 1, Scope 2 and selected Scope 3_220614.pdf

Page/ section reference
Page 1 and 2

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Purchased goods and services
Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
EY verification letter 2021 Scope 1, Scope 2 and selected Scope 3_220614.pdf

Page/section reference
Page 1 and 2

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
72

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?
Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C3. Business strategy	Product footprint verification	Life cycle assessment (LCA) methodology based on the ISO standards ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.	Life cycle assessment of products from Borregaard, Sarpsborg. (2021) The 2019 LCA of products from Borregaard Sarpsborg.pdf
C4. Targets and performance	Financial or other base year data points used to set a science-based target	Science Based Targets initiative (SBTi) criteria	Approved science-based targets, Borregaard ASA. SBTi (2019) SBTi 191011 Decision Letter - Borregaard AS.pdf
C5. Emissions performance	Year on year emissions intensity figure	Global Reporting Initiative (GRI) sustainability reporting standards	Independent assurance report on Borregaard ASA's 2021 Sustainability Reporting. EY attestation GRI Borregaard 2021.pdf
C6. Emissions data	Year on year change in emissions (Scope 3)	GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.	Greenhouse gas protocol Scope 3 reporting Borregaard 2021 and updated analysis 2020 Norsus GHG reporting Borregaard 2020. Updated analysis_220426.pdf Norsus GHG protocol Scope 3 reporting Borregaard 2021.pdf
C12. Engagement	Product footprint verification	Environmental Product Declaration (EPD) in accordance with ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures	Customers in supply chain: Environmental Product Declaration of speciality cellulose, bioethanol, lignin/lignosulfonate, vanillin, hydrocloric acid and sodium hydroxide from Borregaard, Sarpsborg. (2021) www.epdnorge. no. 1657_Lignosulfonate-liquid-Dustex_no_1(2).pdf NEPD-2973-1657_Anhydrous-Bioethanol-99--(1)(1).pdf NEPD-2972-1657_Vanillin.pdf NEPD-3017-1686_Sodium-Hypochlorite.pdf NEPD-3016-1686_Sodium-Hydroxide.pdf NEPD-3015-1686_Hydrochloric-acid.pdf NEPD-2975-1657_Lignosulfonate-powder-total.pdf NEPD-2974-1657_Lignosulfonate-liquid-Dustex(1).pdf NEPD-2971-1657_Speciality-Cellulose.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?
Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
EU ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

EU ETS

% of Scope 1 emissions covered by the ETS
90

% of Scope 2 emissions covered by the ETS
62

Period start date
January 1 2021

Period end date
December 31 2121

Allowances allocated
157676

Allowances purchased
0

Verified Scope 1 emissions in metric tons CO2e
137579

Verified Scope 2 emissions in metric tons CO2e
37780

Details of ownership
Other, please specify (Scope 1: Facilities we own and operate. Scope 2: purchased steam from a waste incineration plant regulated by the EU ETS)

Comment
Verified scope 1 emissions: Facilities we own and operate. Verified scope 2 emissions: Purchased steam from Sarpsborg Avfallsenergi, a waste incineration plant regulated by the EU ETS.

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Borregaard's operation in Norway are within the EU-ETS system. Our strategy is to comply with the EU-ETS schemes in which we participate, and are included in. Norway has taken the EU-ETS regulation into a separate regulation for Greenhouse gas emission allowances. Norwegian Environment Agency has given an emission permit to Borregaard's operation in Norway.

Borregaard's operation in Norway application for free allocation of allowances for the next EU-ETS period starting from 2021 to 2030 has been approved. Borregaard is eligible for free allocation of climate allowances, according to the Commission Delegated Regulation (EU) 2019/331 of 19 December 2018 determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC of the European Parliament and of the Council and Commission Delegated Decision (EU) 2019/708 of 15 February 2019 supplementing Directive 2003/87/EC of the European Parliament and of the Council concerning the determination of sectors and subsectors deemed at risk of carbon leakage for the period 2021 to 2030 .

In the allocation process for free allowances in 2012-2020, the allocation was based on historical emission data. Borregaard's energy strategy for more than 15 years has been to increase the renewable content of energy. For the period 2012 to 2020 Borregaard received more free allowances than the CO2 emission emitted, thus Borregaard has a surplus of climate allowances. For the period 2021-2030 we will receive fewer allowances. The number of allowances received for the period 2021-2025 will balance the need for free allowances. For the period 2025-2030 we expect to receive fewer free allowances, but it might be balanced with our emissions if we are able to reduce emission of CO2 according to our target of 42% reduction in 2030 from a base year in 2020. This has put Borregaard into a favourable position for the EU-ETS period 2021-2030 where we expect the number of free allowances to be reduced gradually, due to changes in the EU-ETS scheme, but that we are able to balance this reduction with reduced emissions of CO2. As of 31 December 2021, Borregaard owns 741,969 CO2 emission rights. However, Borregaard has an obligation to deliver 137,579 emission rights in 2022 for emissions in 2021.

Strategy to comply

- **Permit:** Borregaard monitor the GHG emission according to the method given by the permit ("Tillatelse til kvotepliktig utslipp av klimagasser for Borregaard").
- **Calculation method:** The emissions must be calculated from a standard method given from the regulation/permit and that is valid for all of the emission sources. The emission is calculated from the activity data (amount of energy source or process source (limestone) and multiplied with a standard emission factor given by the permit. For some of the emission sources the emission factor is corrected for an oxidation factor. A procedure for how all the calculations has been done is implemented.
- **Monitoring:** Monthly the emission is calculated to check and review the development in emission in comparison to last year or last month, but also to check if all the data are correct. Yearly all the activity and emission data are controlled and verified by a third party (DNV). When the verification is finished, the GHG emission is sent to the Norwegian Environmental Agency.
- **Risk assessment:** Borregaard has done a risk assessment for this process, to make sure that all activities are in place to make sure that the GHG emission data that are within EU ETS are correct and has the accuracy that is required in the regulation of EU ETS, in 2021 the risk assessment for allocation of data was updated.
- **Surrender of allowances:** Borregaard has an account in the Norwegian Emissions Trading Registry (Union Registry). By the end of April each year Borregaard must surrender enough allowances to cover the verified emissions in the previous year.
- **EU ETS 2021-2030: Borregaard has received free climate allowances for the period 2021-2025. Our procedures for allocation have been updated and data for 2021 have been verified.** This means that we will use even more resources to follow the procedures both for allocation of free allowances and for reporting of the GHG emission to the authorities.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price
Navigate GHG regulations
Stakeholder expectations
Change internal behavior
Drive energy efficiency
Drive low-carbon investment
Stress test investments
Identify and seize low-carbon opportunities

GHG Scope
Scope 1

Application
Borregaard's GHG emissions within EU-ETS is 90% of the company's scope 1, thus is highly relevant for the operations in Norway. Borregaard's operations in Sarpsborg has established an Energy and Climate committee which assesses monthly energy cost, including the carbon price. The carbon price is a factor which influence the energy price, and this is used for energy mix decisions, in short-term and long-term perspective. The energy production has 4 different combustibles: Liquid natural gas (LNG), Light fuel oil, Electricity and Waste. To some extent it is possible to change the volume between them, especially for the peak load energy production. The energy price for the different sources includes the carbon cost and is included in the KPI-diagrams for energy cost. For instance, LNG or electricity are used for peak load steam, the carbon price is an important factor in the calculation to decide which source to use. This is assessed monthly in the Energy and Climate committee.

Actual price(s) used (Currency /metric ton)
542

Variance of price(s) used
Borregaard Sarpsborg uses 2 different fossil combustibles: Liquid natural gas (LNG) and municipal waste (consist of both fossil and biogenic sources) in the energy production in addition to the renewable sources like heat energy produced from electricity and from internal produced biofuel. The cost of each combustible is calculated in NOK/MWh, with and without the carbon price. Borregaard has made a price model to monitor how different factors in energy cost structure changes, including the CO2 cost from the carbon price. The data trend is discussed in the monthly Energy and Climate committee meeting. The carbon price is calculated as ICE EUA front month and changed to Norwegian currency NOK. In 2021 the average carbon price used was NOK 542/ton CO2, maximum was NOK 921/ton CO2 and minimum was NOK 320/ton CO2. The contribution to the internal cost of steam produced from LNG from the internal carbon price was 25% in 2020, in 2017 the contribution was only 3,5% reflection the increase in pricing of EUA allowances. Our internal price model for steam will favour steam for renewable sources as the price of climate EUA allowances increase.

Type of internal carbon price
Implicit price

Impact & implication
Impact on energy efficiency and energy cost and change in internal behaviour: The energy price for the different combustibles sources includes the carbon cost and is included in the Key Performance Indicator (KPI) diagram for energy cost that is discussed in the monthly Climate and Energy committee meetings. For instance, LNG or electricity is used for variable load steam, the carbon price is an important factor in the calculation to decide which source to use. A prognosis is made every month by the Energy Director, and the prognosis is changed during the month if necessary and based on the prevailing market prices. For example, if energy or carbon prices changes significantly over a short period of time, Borregaard adjusts its operational prioritization of LNG versus electricity correspondingly . The was indeed the case for 2021 and the results are assessed monthly in the Borregaard Energy and Climate committee. Moreover, the Energy and Climate committee assesses the long-term consequences of changing energy and carbon market prices. During 2021, several energy efficiency measures have been fast-tracked as a result of increasing energy and carbon prices. The KPI-system for climate and energy makes the climate cost and impact visible for the management, and makes it easier to make the right decisions regarding climate and energy issues. Drive low carbon investment and identify and seize low carbon opportunities: Borregaard uses the energy price model to make prognoses for how changes in cost of climate allowances and other factors will influence the energy cost. In 2021 the CO2 price has increased, and it is expected to increase further. The model for the energy cost is used in projects and are used to calculate the influence of the CO2 emission reduction projects in line with Borregaard's Science Based Target commitment.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?
Yes, our suppliers
Yes, our customers/clients
Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement
Innovation & collaboration (changing markets)

Details of engagement
Run a campaign to encourage innovation to reduce climate impacts on products and services

% of suppliers by number
9

% total procurement spend (direct and indirect)
43

% of supplier-related Scope 3 emissions as reported in C6.5
100

Rationale for the coverage of your engagement
To reduce the environmental footprint of Borregaard's bio- based products we need to reduce the environmental impact from our value chain. In 2021 63% of Borregaard's GHG emissions were scope 3 emissions. Cat 1-Purchased goods and services constituted for 37% of our Scope 3 GHG emissions and 38% came from Cat 4 and 9, Upstream- and Downstream transportation and distribution. Out of our 3,000 suppliers, 250 have been identified as having the majority of impact on our Scope 3 emissions. These are suppliers of transportation services, chemicals, and wood. And these are the ones we targeted when we in 2021 ran a campaign to improve internal and external data collection and our supplier engagement with the purpose of encourage our suppliers to develop new ways to reduce climate change impacts of the products/services they offer. The campaign was run through both existing and new communication channels. The campaign consisted of the following elements: 1) Sharpening our requirements and how we evaluate the responses in the Requests for Quotations (RFQ) with respect to emissions. 2) Updating the Supplier Code of Conduct (SCoC) to include more detailed requirements regarding emissions and a better reference to the relevant international principles. Further, the SCoC was translated into Chinese, Norwegian, Polish, Portuguese, and Spanish. 3) Establishment of an E-learning tool. The first set of training material on this tool "Training & Capacity Building for Suppliers" covers Borregaard's sustainability approach and our expectations to our suppliers regarding environment and CO2 emissions, emphasizing the need for cooperation and transparency in the value chain. The "Training & Capacity Building for Suppliers" was sent to all suppliers classified as Strategic for Borregaard Sarpsborg, transportation services, chemicals, and wood included. 4) Selecting EcoVadis as a partner and tool to assess, monitor and drive change in our supply chain. In addition to enable us to share our own performance within the topics Environment, Labor and Human Rights, Sustainable Procurement and Ethics, EcoVadis enables us to manage and drive improvements amongst our own suppliers, by identifying shortcomings and improvement areas, agreeing actions with the supplier and enable us to follow up that the agreed actions are being completed.

Impact of engagement, including measures of success
The overall measure of our success is the reduction in our scope 3 emission, where the Science Based target (SBTi) is 25% reduction in 2030 from a 2020 base year. Our most effective way to get there is to engage with ambitious suppliers, request documentation of actual progress and include CO2 emissions as criteria in the supplier selection process. To succeed we must set targets, document and measure the results. Should a supplier be regarded non-compliant in some part of the purchasing process, we investigate the possibility to influence the supplier towards better performance, rather that immediate end the relation. Some examples of measuring the impact of our engagement are: KPI for signed Supplier Code of Conduct (SCoC): All our suppliers (non-critical excluded) must sign our SCoC or equivalent, in which the supplier confirms to minimize emissions. In 2021 88 % of all new suppliers committed to our SCoC, measured by a monthly KPI. Measuring the response of the E-Learning "Training & Capacity Building for Suppliers". It was sent to 38 suppliers and 13 suppliers completed it. A second and improved set is planned for. Measuring the numbers of suppliers on EcoVadis and assessing the information they provide. So far 70 suppliers have submitted company information on the platform and the number is increasing. In 2021, we improved our data collection for Mode of Transportation (MOT) and calculated CO2 emission factors for each mode. This enables a structured and fact-based approach on initiatives for reduced carbon emissions in transport going forward. The emission factors will be updated on an annual basis to reflect the rapid development towards a greener logistics industry. The combined information of tonne/km and emissions per MOTs enable us to make better decisions when selecting MOT, by preferring MOT with lower emissions when possible and accommodating for lower emissions alternatives. Borregaards activities towards suppliers regarding climate issues are followed up through the "Scope 3 Program" which we established in 2021. Core personnel meets once each month to follow up agreed actions and decide new actions, in line with the established goals and ambitions. The Scope 3 Program reports to the Sustainability Board twice a year.

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Education/information sharing	Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number

80

% of customer - related Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

Borregaards main objectives is successful development and sales of sustainable and climate-friendly products that can replace oil-based products. At our Capital Market Day in 2020, we communicated that one of our strategic priorities was to capitalize on Borregaard's biorefinery model and biobased solutions. There is an opportunity for value growth within markets where sustainability is a key factor. An important stage of a successful sustainability marketing is to share the relevant sustainability information about products and certifications. In 2021 we launched new and updated web pages, with specific information for each product group and how the product group can have positive impact on sustainability and climate-related issues. 30 % of the pages at www.borregaard.com have sustainability content. Sustainability certificates and Environmental Product Declarations (EPDs) for 8 different products are available on the web pages. The EPDs can help our customers make calculations on how our products improve their environmental footprint. As an example, our construction products offers an improvement of the environmental footprint versus the synthetic alternative. By replacing 1 kg of the synthetic alternative with our product the customer reduces 50-88 % of CO2. Another example is soil conditioning where our customers can reduce their CO2 emissions by up to 90 % by replacing their synthetic complexing agent with our bio-based products. This creates good customer dialogue, and together with Technical Bulletins for specific applications we are able to exploit the full market potential of biobased products. For this engagement we have selected the customers in our BioSolution division, which have 80% of our customers (globally) and product within several areas like, Concrete admixtures, Gypsum board, Ceramics, Animal feed, Agro chemicals, Soil conditioner and Batteries. Several different markets and customers will result in high impact for transition to more low emission products and increase the revenue. A sustainability task force within BioSolution has been established to produce and develop the necessary documentation and sustainability training for sales persons are conducted. Scope 3 emissions is zero, most products are 100% biochemicals, but when replacing a oil-based chemical in our customer process, the customer will reduce its scope 3 emission.

Impact of engagement, including measures of success

The aim of the impact of our engagement is value growth from markets where sustainability is a key factor, thus the final measure of success is the increase in EBITDA from increased sales revenue. However there is several activities that can have impact on EBITDA, thus we have started to measure sustainability interest from our customers or potential customers specifically within the BioSolution division. This is measured by leads in our Customer Relation System "HubSpot" based on behavioural data for customers or potential customers. We measure sustainability interest per market, example of markets with high sustainability interests are within in plant nutrition and in pelleting performance, and we are now experiencing a increasing pull from the market requesting sustainability information about our product. The main tasks for the Sustainability Task Force in BioSolution, is to update and collect data even more detailed EPD's, implement and update relevant sustainability certificates, do competitor analysis for CO2 and environmental footprint of competing product, training campaigns for staff within sales and to provide sustainability information about issues like biodegradability or other information that we see is relevant for our customers to improve their climate and environmental impact. In 2021 we established KPIs that measure sustainability interest within our customers and contact database. The KPI's are monitored monthly in the Sustainability Task Force, and quarterly in the Management meeting in BioSolutions. The Measure of success of the activities within sharing information about sustainability is measured as a yearly total increase of 20% of the established KPI's. Some examples of the KPIs are: • Webpage traffic to our sustainability pages • Number of increased contacts with high sustainability interest • Deals influenced by sustainability – new and existing customers • Deals won turned into business influenced by sustainability.

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Development of low-emission technology and products

Engagement strategy

Borregaard's main objective is to produce sustainable products and solutions based on renewable raw materials. Borregaard will, as a company, take climate action and demonstrate how its business can help to advance sustainable development by both minimising negative environmental impact and maximising positive impacts. The company has also committed to a science-based target for climate gas reduction and the strategy of the company is to have a leading position in the green shift transformation. Engagement with other value chain partners other than suppliers and customers, like climate technology clusters, organisations and associations that promote the shift to a low-emission society is an important part of the strategy. Partners Borregaard chose to focus our engagement on/prioritize, must fit into the strategy above, and have the ability to develop low emission technology. Development of new technology also requires public partners that are willing to take some financial risk in all phases of a project from research and development to the commercialisation phase. Example of partners, our method of engagement and measure of success are described below.

Example Technological Cluster Øra cluster

Carbon Capture and Storage (Scope 1, CCS).

Borregaard is a partner together with other industries in the area near Sarpsborg and research organisations in the Øra Cluster. The methods of engagement are participating in meetings, emission data and funding of the projects. The project aims to contribute to the United Nations sustainability goals, circular economics and national climate policy through reduced emissions of CO2.

· Contributing to increased value creation with partners and developing today's business models towards the future environmental requirements.

· Development of local and regional competence and green jobs.

· Contributing to the development of new small-scale technology, decarbonization, transport solutions as well as the sustainable use, and storage of CO2.

The project will involve:

· Experience transfer and technology development, for significantly reduced operations and investment costs

· Integration into and expanded use of established value chains, i.e. transport and storage

· Developing business models, financing solutions and legal frameworks-for predictable operation with acceptable profitability.

In the reporting year the measure of success was that the project continued and in long term is to have gain the targets within the project and finally invest in a solution to reduce scope 1 emissions with CCS.

Example Association of industries for increased financial grants

Forum for support/development of environmental technology (FFM) Borregaard is a member of FMM. The main target of the work for FFM is to realise the ambition that the industry in Norway should be a world leader in development of environmental technology. To achieve that, risk transfer by public funding that covers all phases from research and development to commercialising is necessary. Through meetings/discussions/documentation/examples with political/governmental bodies the industry has achieved increased financial grants to support the development of environmental and climate technology.

Example Organisation for technological support Zero Emission

Zero is a Norwegian environmental organisation that work with reduction of GHG emissions, primarily in Norway. The philosophy of the organisation is that if new facilities are made emission-free, then when existing plants and methods are phased out due to old age, society is left with emission-free facilities. The primary working areas include CO2 disposal, renewable energy, especially wind power, and renewable fuel for transport. This is an important organisation for influencing the shift to a low emission society in Norway. Borregaard as a co-operation with Zero for information/promotion of renewable/bio-based chemicals/materials. The methods of engagement are meeting and conferences. The measure of success is in the reporting year was the initiative "System smart use of energy project" where several actors work together to find solutions for fast and rational electrification in Sarpsborg where Borregaard is located.

Example Partnership for investment in forest related sector

In 2018 Borregaard established Shelterwood AS, together with other industry and financial partners, that shall stimulate new investment in forest related sectors. Shelterwood will invest in companies in an early growth phase, that both can create some revenue to the owners and contribute to lift the forest related sector at the national level. Borregaard will contribute with its industrial competence and financial resources on bio-based raw materials for sustainable products. The measure of success this year was investments in a company with bio-based products and the long-term target of the financial result from the investment.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

Yes, suppliers have to meet climate-related requirements, but they are not included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement
Implementation of emissions reduction initiatives

Description of this climate related requirement
We set requirements regarding emission reduction activities to our suppliers throughout the purchasing process, from supplier approval to performance evaluation and follow up. As part of the supplier approval process, all new suppliers must sign our Supplier Code of Conduct (SCoC) or equivalent, in which the supplier confirms to minimize emissions. As part of the sourcing process in the 2021 Request for Quotation (RFQ) for chemicals we included information about our sustainability approach, as well as request for the suppliers to provide Environment Product Declarations (EPD) and actual figures for CO2 emissions. Further, as of 2021, we tendered our transport services with requirements to respond with plans for reducing carbon footprint in the short, medium, and long term. Combined with our improved data collection in 2021 for Mode of Transportation (MOT) and calculation CO2 emission factors for each mode this enables a structured and fact-based approach on initiatives for reduced carbon emissions in transport going forward. The combined information of tonne/km and emissions per MOTs enable us to make better decisions when selecting MOT, by preferring MOT with lower emissions when possible and accommodating for lower emissions alternatives. We have for several years a Supplier Development Action Plan (SDA) Program in place for following up the suppliers. Suppliers are followed on the sustainability issue they impact the most, emissions being one in particular.

% suppliers by procurement spend that have to comply with this climate-related requirement
10

% suppliers by procurement spend in compliance with this climate-related requirement
6

Mechanisms for monitoring compliance with this climate-related requirement
Supplier self-assessment
First-party verification
Supplier scorecard or rating

Response to supplier non-compliance with this climate-related requirement
Retain and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate
Yes, we engage directly with policy makers
Yes, we engage indirectly through trade associations
Yes, we engage indirectly by funding other organizations whose activities may influence policy, law, or regulation that may significantly impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?
Yes

Attach commitment or position statement(s)
Borregaard Group Policy for EHS and Climate; chapter 4.2 Climate and chapter 5.0 Key Targets
Borregaard Group Policy-environment-climate-health-and-safety-engagement.pdf

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy
Borregaard has a clear and well communicated sustainability and climate change strategy: to provide sustainable solutions and products based on renewable raw materials and commitment to Science Based Target GHG reductions for the whole value chain. Climate-related issues are integrated into Borregaard's governance mechanisms, including the process to ensure consistency in our engagement in the overall climate change strategy. A Sustainability Board (SB) has been set by the CEO to coordinate all the sustainability and climate related activities within the company and to inform and guide the CEO and the Group Executive Management on which sustainability issues to address and which measures should be implemented. Member of SB have central positions within climate across the whole company, and 3 of the members are member of the Group Executive Management. The SB is responsible for writing the yearly Sustainability report, which summarizes the engagement within climate change: current situation, planned activities for emission reductions, results and targets, climate risks/opportunities and scenarios, changes in regulations. The report is used internally for communication of the climate change strategy. Regulatory issues and hearings regarding climate change are within the responsibility of the SB and SB has members in climate committees in The Federation of Norwegian Industries and in the trade associations CEPI and CEFIC, which ensure consistent positions. In addition we have a climate and energy committee with members from different positions that either are users of energy, produce energy or control energy consumption at the biorefinery in Sarpsborg (86% of scope 1 and scope 2 emissions). This ensures a consistency in our engagement activities for recommendation of investments and operational decisions that can influence the direct climate gas emission. Reporting of climate gas emissions and related data at company level is centralized, EHS and Sustainability Manager at in Sarpsborg. Climate related KPI's are reported monthly, quarterly and annually. The data is verified by third party. The data is used as input to energy and climate targets, as input to LCA analysis and used in projects for prioritisation or applications for grants. The environmental product data sheets (EPD) of the product are kept updated and communicated to the sales organisation for use in customer communication.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Focus of policy, law, or regulation that may impact the climate
Emissions trading schemes

Specify the policy, law, or regulation on which your organization is engaging with policy makers
Regulation: Indirect CO2 compensation – EU ETS State Aid Guidelines (Legal basis: Article 10(6) ETS Directive), defines the rules for compensating indirect carbon costs passed into electricity prices and mitigating risk of carbon leakage.

Policy, law, or regulation geographic coverage
National

Country/region the policy, law, or regulation applies to
Norway

Your organization's position on the policy, law, or regulation
Oppose

Description of engagement with policy makers
On 14 July 2021, the European Commission adopted a series of legislative proposals, setting out how it intends to achieve climate neutrality in the EU by 2050, including the intermediate target of an at least 55% net reduction in greenhouse gas emissions by 2030. The package proposes to revise several pieces of EU climate legislation, including the EU ETS. Under the EU emissions trading system (EU ETS), industrial installations considered to be at significant risk of carbon leakage receive special treatment to support their competitiveness. Carbon leakage refers to the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. This could lead to an increase in their total emissions. Borregaard production of biobased organic chemicals, belongs to the NACE code 20.14, which in the European Commissions proposal had been taken of the list for carbon leakage, due to that the trade intensity of the products was to low to be eligible for compensation, compared with other energy intensive sectors. Borregaard has together with The Federation of Norwegian Industries (NI) and through the Norwegian authorities - argued for the full eligibility for NACE 20.14 and has provided qualitative date for trade intensity that shows that the intensity is a the same level of other industries that are eligible for indirect CO2 compensation. Borregaard has worked together with Cefic, which urged the Commission to consider in its review of the EU ETS State Aid Guidelines the qualitative assessment of NACE 20.14for eligibility for indirect cost compensation, because the sector is at risk of carbon leakage due to indirect emissions costs for phase IV of the EU ETS. Comments to the draft guidelines for indirect CO2 compensation has been given from Borregaard together with Cefic and NI, which have supported our view, and communicated to the Commission, that we oppose that NACE 20.14 is no longer on the list of sectors eligible for indirect CO2 compensation. Our engagement is aligned with the Paris Agreement, if indirect cost of the power price is not compensated in EU, production can be transferred to outside EU, which can lead to an increase in their total emissions. Upcoming opportunities for electrification (fuel and electricity exchangeability being a key metric) will only succeed if electricity costs can be kept competitive through indirect cost compensation.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation
Our proposal was to include NACE 2014 on the list of sectors eligible for indirect CO2 compensation, based on new and complete data from the sector for actual trade intensity. Due to their trade intensity, products from the sector NACE 20.14 have no ability to pass through the EU policy costs to their customers. Their basic products support complex and long value chains in the chemical sector essential throughout whole economy.

Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Focus of policy, law, or regulation that may impact the climate
Electricity grid access for renewables

Specify the policy, law, or regulation on which your organization is engaging with policy makers
Policy: As a part of the Norway's Climate Action Plan for 2021–2030, the Government will increase power grid capacity and increase renewable energy production: Norway must contribute to high availability of renewable energy at competitive cost for the Industry and to secure access to renewable energy at still competitive conditions for both power and costs for the use of the grid. Borregaard support this with no exceptions.

Policy, law, or regulation geographic coverage
Regional

Country/region the policy, law, or regulation applies to
Norway

Your organization's position on the policy, law, or regulation
Support with no exceptions

Description of engagement with policy makers
Engagement: •On 11 June 2021, the Ministry of Petroleum and Energy in Norway appointed a public committee to assess the development of the electricity grid. An important task for the committee was to propose measures that can reduce the time it takes to license new network facilities. This can contribute to faster and more efficient development of the power grid. Borregaard has written a letter to the committee to inform about our position. •Borregaard Sarpsborg is member of The Federation of Norwegian Industries (NI). NI works for framing conditions for generation of more renewable energy, especially is electric energy from renewable sources important. Available on the grid in the future, and the future development of the grid for renewable electricity and the energy cost. Borregaard take active part in NI, to support the engagement and takes also part in meeting with policy makers. •The initiative of Process21 was launched in the white paper about Norwegian industry in March 2017 (Meld. St. 27 (2016-2017)). In 2018, the forum was formally established by the Norwegian government. Borregaard has been a member of the steering committee and has participated in several expert groups. Process21 has given strategic advice and recommendations to the government and other actors on how to combine sustainable growth and reduced emissions from the process industry.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation
<Not Applicable>

Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association
European Chemical Industry Council (CEFIC)

Is your organization's position on climate change consistent with theirs?
Consistent

Has your organization influenced, or is your organization attempting to influence their position?
We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)
Cefic position (annual report) on climate change: Cefic supports the Green Deal and Europe's ambition to become climate neutral by 2050. The European chemical industry has the ambition to become climate neutral by 2050, and the sector is uniquely positioned at the heart of European manufacturing to contribute to realizing a climate-neutral society. At the same time, the chemical industry must remain competitive while undergoing a green and digital "twin" transition in order to become climate-neutral, circular and digital, all while navigating the Chemicals Strategy for Sustainability (CSS), which will not only affect the sector economically for the years and decades to come, but it will also create a significant "ripple effect" across many value chains relying on chemicals. For this transition to be successful, a clear pathway that includes concrete timelines, milestones, and measures should be put forward by EU policymakers in close collaboration with Industry. This Transition Pathway for the chemical industry should ensure the availability of competitively priced renewable and low-carbon energy, promote innovation and the deployment of breakthrough technologies, support the development of relevant infrastructure and facilitate access to public and private finance. Our organization's position does not differ from Cefic position. Our organisation provide Cefic with information on how biobased chemicals can contribute to climate neutrality, and together with other industries we make common position notes for biobased chemicals, i.e. accurate accounting for carbon from biomass in the Product Environmental Footprint (PEF) and communication on sustainable carbon cycles as a chance for biomass-derived chemistry to stress its multi-facetted contribution to the EU climate ambition.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)
386615

Describe the aim of your organization's funding
Borregaards climate change strategy is to provide sustainable solutions and bio-based products based on renewable raw materials (low CO2 emissions compared to alternatives) and to reduce its emission of CO2 in the whole value chain by committing to a science based target in line with the targets in the Paris agreement. The aim our organisations funding is to ensure that the contribution of bio-based chemicals to reach the target of a climate neutral Europe is understood amongst the policy makers.

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Trade association
Other, please specify (Cepi is the European association representing the pulp and paper industry. Members of CEPI offer a wide range of renewable wood-based fibre solutions to EU, 78% of the wood from certified forests, 92% of the water is returned in good condition.)

Is your organization's position on climate change consistent with theirs?
Consistent

Has your organization influenced, or is your organization attempting to influence their position?
We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)
In 2019, CEOs representing the European paper industry outlined their plans to reach a climate-neutral Europe by 2050 in a declaration which was officially handed over to Clara De La Torre, Deputy Director-General of DG CLIMA and Timo Pesonen, Director-General of DG GROW, present along with other European Commission representatives. "The way forward finds its foundations in the very solid basis of our existing achievements. We have guaranteed the sustainability of our raw materials, improved the performance of our processes and proven the climate friendliness of our products. Sustainable raw materials: our raw material is wood pulp, which is intrinsically renewable if coming from properly managed forest sources; this is why we have helped create a number of programmes for the certified sustainability of forests across Europe such as PEFC (Programme for Endorsement of Forest Certification and FSC (Forest Stewardship Council). We have expanded sustainable forest management practices in Europe and globally. Decarbonised processes: we have delivered a successful decarbonisation of our operations of 31% from 2005 to date. Our sector is investing at a rate of more than billion per year to decarbonise, with a commitment to making our production processes more efficient and decreasing our overall carbon footprint thanks to new technologies and collaboration with our partners. A step change is ultimately needed and supported by breakthrough technologies and solutions. We are committed to searching for them. Climate-friendly products: world champions in recycling, we have worked with local authorities to improve separate collection of paper and board to boost the use of recycled fibres in new products. We now plan to push our model even further in a final goal of providing innovative sustainable solutions for a range of new sectors, for example textile, through new bio-based products" Borregaard position is does not differ from the position of CEPI. We support the work of CEPI and Borregaard experts are active in the Climate and the Environmental committee and participate in creating trade association positions, with supporting data .

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)
170000

Describe the aim of your organization's funding
Borregaards climate change strategy is to provide sustainable solutions and bio based products based on renewable raw materials (low CO2 emissions compared to alternatives) and to reduce its emission of CO2 in the whole value chain by committing to a science based target in line with the targets in the Paris agreement. The aim our organisations funding is to ensure that the contribution of biobased chemicals to reach the target of a climate neutral Europe is understood amongst the policy makers.

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Trade association
Other, please specify (Norwegian Federal Industry Association. NI works for framing conditions for businesses in sectors and industries in Norway.)

Is your organization's position on climate change consistent with theirs?
Consistent

Has your organization influenced, or is your organization attempting to influence their position?
We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)
The Norwegian Federal Industry Association (NI) support the COP21 (Climate Convention in Paris) ambitious climate targets, where the overall aim is to restrict growth in global average temperature to well below 2°C compared to pre-industrial levels, and strive to keep the temperature growth to 1.5°C and the aim of the agreement to "net zero emissions" between 2050 and 2100. "OUR VISION: COMBINING GROWTH AND ZERO EMISSIONS BY 2050. Our vision is a pronounced growth for Norwegian process industries driven by higher production and development of new processes and products. At the same time, greenhouse gas emissions will be phased out altogether. This vision can be achieved if we succeed in developing and applying the technologies presented in this Roadmap. The low carbon economy will increasingly

demand products with small carbon footprints from both production and use. In addition, there will be more need for products used for both generation and storage of renewable energy. The Norwegian process industry sector is already well-positioned, and is highly capable of fortifying its position as a world-leader in areas relating to energy, climate and environment." Borregaard shares the same position as NI. The federation's most important task is to work with long-term industrial and business policy, including framing conditions for climate, environment and sustainability. Borregaard plays an active role and is a member of both the environment, climate and transport committees. A process for developing a road map for the Norwegian Industry toward zero emissions of CO2 in 2050, together with increase in gross value added has recently been conducted, with high level involvement from Borregaard.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)
275046

Describe the aim of your organization's funding
Borregaards climate change strategy is to provide sustainable solutions and bio based products based on renewable raw materials (low CO2 emissions compared to alternatives) and to reduce its emission of CO2 in the whole value chain by committing to a science based target in line with the targets in the Paris agreement. The aim our organisations funding is to ensure that frame conditions for renewable energy supply to reach our climate targets is understood amongst the policy makers in Norway and that they understand the implication of the low carbon economy has on higher demand for products with small carbon footprints from both production and use. The Federation's most important task is to ensure that the authorities adopt a long-term fiscal policy and framing conditions for a competitive Norwegian industry including supply of renewable energy.

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.3c

(C12.3c) Provide details of the funding you provided to other organizations in the reporting year whose activities could influence policy, law, or regulation that may impact the climate.

Type of organization
Non-Governmental Organization (NGO) or charitable organization

State the organization to which you provided funding
Zero is a non-profit, politically independent organization with a knowledge-based and analytical approach to the climate issue. Zero works to ensure that everyone can contribute and become part of the solution with the goal is to develop zero-emission solutions, at the expense of solutions that produce emissions.

Funding figure your organization provided to this organization in the reporting year (currency as selected in C0.4)
130000

Describe the aim of this funding and how it could influence policy, law or regulation that may impact the climate
Borregaard has entered into a multi-year co-operation and support agreement with Zero, focusing on political/technical framework for bio-based products and solutions. The aim of the funding is to get support from Zero on the necessary measures and decisions that must be taken by the authorities so that Borregaard can reach our ambitious SBT target for scope 1 and scope 2 emissions in 2030. The impact we are focusing on now, is to influence the authorities to increase the power supply of renewable electricity in Norway by increasing the grid capacity and production of more renewable energy to use for industry purposes. ZERO is the secretariat for a project named "System smart use of energy project" which together with several actors in the Glomma region, where Borregaard in Sarpsborg are situated, will look at how different solutions can make enough power and energy available for increased electrification of the energy production at Borregaard and reduce the pressure on the power grid in the region. The aim of the project is to look at how different solutions together can ensure fast and rational electrification in the region and and of Borregaard. We will do this by looking at solutions like consumer flexibility, connection on terms, local energy production and storage, energy efficiency and increased use of thermal energy. The actors in this project are Elvia, which is the grid owner in the area, Borregaard, Akershus Energi, Østfold Energi, Viken Fylkeskommune and ZERO. The project runs until September 2023.

Have you evaluated whether this funding is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication
In mainstream reports

Status
Complete

Attach the document
Borregaard Annual Report Sustainability Report 2021.pdf

Page/Section reference
Page 4-7 Page 37-80 (Sustainability and corporate responsibility)

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
The report is our Annual report 2021. In our voluntary communications we have , you will find all you need to know about Borregaards our sustainability work at https://www.borregaard.com/sustainability/sustainability-documentation/: •Separate TFCD report, see page 1-24 •Climate Scenario Analysis, see page 1-20 •Scope 3 GHG reporting 2021

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, both board-level oversight and executive management-level responsibility	Wood is an essential raw material for Borregaard as our business model is based on utilisation of all compounds of the wood. Forests are important from a climate perspective and for biodiversity as a home for a variety of important species. It is important that forest resources are used in an optimal way and that forest management is carried out in a responsible and sustainable manner. To minimise the impact from felling and forestry operations, Borregaard attaches significant importance to sourcing wood from forests that are certified according to the FSC and PEFC standards. Both standards ensures that biodiversity is taken care of. Due to the importance of wood and sustainable forestry in Borregaard, biodiversity is naturally integrated into Borregaard's governance mechanisms. The Board of Directors considers biodiversity issues related to wood sourcing when reviewing and guiding strategy, risk management policies, annual budgets, and business plans, as well as setting Borregaard's performance objectives. The President and Chief Executive Officer (CEO) is the highest responsible for biodiversity issues under the Board of Directors as biodiversity issues are part of Borregaard's business strategy and are considered important for the company's long-term success. The CEO is ultimately responsible for monitoring, assessing and managing biodiversity, mostly related to the sourcing of wood. The responsibility for biodiversity lies with the CEO because it is of utmost importance for the company that the CEO has a complete picture of all climate-related issues that can affect the business plan and can then also allocate the right resources to achieve the long-term strategies and goals.	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments only	Commitment to avoidance of negative impacts on threatened and protected species Commitment to no conversion of High Conservation Value areas Commitment to secure Free, Prior and Informed Consent (FPIC) of Indigenous Peoples Commitment to no trade of CITES listed species	<Not Applicable>

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?	Portfolio
Row 1	Yes, we assess impacts on biodiversity in our upstream value chain only	<Not Applicable>

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Land/water management Law & policy

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	Response indicators Other, please specify (Requirement to suppliers: 100% certified forest raw materials.)

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Governance Impacts on biodiversity Risks and opportunities Biodiversity strategy	Annual report /Sustainability report (page 46-51) EHS policy Borregaard Annual Report Sustainability Report 2021.pdf
Please select	<Not Applicable>	<Not Applicable>

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	The President and Chief Executive Officer (CEO).	Chief Executive Officer (CEO)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

Borregaard provides sustainable products and solutions with a documented favourable environmental impact which improve the customers' climate footprint. The Group has also committed to science-based targets (SBTi) to further reduce greenhouse gas emissions and strengthen its sustainability platform. Borregaard's combination of strong innovation efforts and biobased products represents an attractive proposition to customers seeking sustainable solutions to improve their environmental footprint. Borregaard contributes to a sustainable development, both through minimising negative environmental impact from own production, as well as improving environmental impact in customers' value chains.

Most customers purchase products primarily for their performance. However, customers and end-users are becoming increasingly concerned with which products they buy, favouring natural ingredients, health benefits and low GHG footprints. Health and safety aspects influence customers' purchasing behaviour. Borregaard's wood-based products represent a non-toxic substitute for chemicals with negative health exposure. Our biopolymers and cellulose fibrils are examples of products replacing harmful chemicals in applications such as coatings, agriculture and adhesives. Some of our customers buy our products for their low GHG footprint. Borregaard's woodbased bioethanol is a good example of this. Compared with petrol, this second-generation alternative has 85% lower greenhouse gas emissions.

Borregaard's innovation success is a result of world class in-house R&D and close co-operation between sales, manufacturing, customers and external institutes and universities in several countries.

With customers in more than a hundred different countries, our products are distributed around the world. Being a buyer of transport services, Borregaard can contribute to climate friendly transport as transportation is an area where low emissions, carbon neutrality and emission free solutions are gaining traction.

Borregaard has engaged an independent third party, Norsus (previous Ostfold Research), to conduct a life cycle assessment (LCA) based on the ISO 14044/48 standard. This analyses the environmental impacts Borregaard's products have from raw materials to finished products. The study was carried out for the first time in 2008 and has since been updated on several occasions most recently in 2015. The analysis confirms that the environmental and climate impacts of Borregaard's products have diminished over time. Norsus has conducted an analysis in which Borregaard's products were compared with competing products. All of the comparisons covered a number of environmental impact categories. The analysis confirmed that Borregaard's products provide better environmental performance than the alternatives in almost all environmental categories and indicate environmental benefits from replacing the alternatives with the company's products.

To answer the questions below we will use the LCA analysis results from the actual product category.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	5805000000

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member
The Dow Chemical Company

Scope of emissions
Scope 3

Allocation level
Facility

Allocation level detail
Borregaard has engaged an independent third party, Norsus, to conduct a life cycle assessment (LCA) based on the ISO 14044/48 standard. The LCA analyses the environmental impacts of our production, from raw materials to finished products- cradle to customer for speciality cellulose from Borregaards biorefinery in Sarpsborg (facility level). recently in 2021 when it was improved and updated with more details from the biorefinery process.

Emissions in metric tonnes of CO2e
0

Uncertainty (±%)

Major sources of emissions
566 kg CO2e/tonne of product produced to Dow Chemical company (raw materials, transportation of raw materials and production of product) + 387 kg CO2 e transportation to customer (average of all customers receiving speciality cellulose). The major source of emissions is the use of energy in the production process at Borregaard and the transportation to the customer. It is possible to obtain more accurate data for the transportation to Dow Chemical company, mode of transportation is known. Scope 3 is selected because this will represent scope 3 emissions in Dow Chemical Company. We have not given details about sold volume and market value, this are commercial data that is already available at Dow for products sold in 2021.

Verified
Yes

Allocation method
Allocation based on the volume of products purchased

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
Please se information in our environmental product declaration for specialty cellulose: NEPD-2971-1657_Speciality-Cellulose.pdf (epd-norge.no)

Requesting member
Schlumberger Limited

Scope of emissions
Scope 3

Allocation level
Facility

Allocation level detail
Borregaard has engaged an independent third party, Norsus, to conduct a life cycle assessment (LCA) based on the ISO 14044/48 standard. The LCA analyses the environmental impacts of our production, from raw materials to finished products- cradle to customer for speciality cellulose from Borregaards biorefinery in Sarpsborg (facility level). recently in 2021 when it was improved and updated with more details from the biorefinery process.

Emissions in metric tonnes of CO2e

Uncertainty (±%)

Major sources of emissions
XXX kg CO2e/tonne of product (dry matter) produced to Schlumberger (raw materials, transportation of raw materials and production of product) + XXX kg CO2 e transportation to customer (average of all customers receiving biopolymers). The major source of emissions is the use of energy in the production process at Borregaard and the transportation to the customer. It is possible to obtain more accurate data for the transportation to Schlumberger limited, as mode of transportation is known. Please contact our commercial team to receive the EPD that is relevant for the product. We have not given details about sold volume and market value, this are commercial data that is already available at Schlumberger for products sold in 2021. Scope 3 is selected because this will represent scope 3 emissions in Schlumberger. Borregaard's BioDrill® product range consists of innovative high-performance solutions for petroleum drilling applications, meeting the industry's increasing demand for efficiency, productivity and sustainability. Borregaard offers sustainable solutions based on renewable bio-based raw materials and unique competence. We utilise lignin from wood to produce an extensive line of environmentally friendly performance additives for the Oil & Gas industry. All BioDrill products are based on environmentally friendly lignin-based polymers, most of which are on the OSPAR List of Substances Used and Discharged Offshore and considered to Pose Little or No Risk to the Marine Environment (PLONOR list).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
Please se information in our environmental product declaration for biopolymers (please take contact with our commercial team for the right EPD for products bought of Schlumberger): NEPD-3612-2301_Sodium-lignin-biopolymer-A-liquid.pdf (epd-norge.no) NEPD-3613-2301_Sodium-lignin-biopolymer-A-powder.pdf (epd-norge.no)

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

Please see information in the Environmental declarations for all of our products :

NEPD-3610-2301_Calcium-lignin-biopolymer-powder.pdf (epd-norge.no)

NEPD-3616-2302_Dustex.pdf (epd-norge.no)

NEPD-3611-2301_Calcium-lignin-biopolymer-liquid.pdf (epd-norge.no)

NEPD-3612-2301_Sodium-lignin-biopolymer-A-liquid.pdf (epd-norge.no)

NEPD-3613-2301_Sodium-lignin-biopolymer-A-powder.pdf (epd-norge.no)

Sodium lignin biopolymer B liquid - EPD Norge (epd-norge.no)

NEPD-3615-2301_Sodium-lignin-biopolymer-B-powder.pdf (epd-norge.no)

NEPD-3015-1686_Hydrochloric-acid.pdf (epd-norge.no)

NEPD-3016-1686_Sodium-Hydroxide.pdf (epd-norge.no)

NEPD-2972-1657-EN EuroVanillin Supreme - wood vanillin (epd-norge.no)

NEPD-2971-1657_Speciality-Cellulose.pdf (epd-norge.no)

NEPD-2973-1657_Anhydrous-Bioethanol-99--(1)(1).pdf (epd-norge.no)

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Customer base is too large and diverse to accurately track emissions to the customer level	Can be done for some customer groups/product groups. Borregaard has 4100 customers and about 750 different products. We have made Environmental declarations (EPD) for the major product group, which can be used for allocating emissions to different customers. More collaboration with our customers to understand how the products are used in different process, will make it easier to do more accurate caclulations.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

Update our LCA analysis with even more details and accuracy and calculate not only the main product groups but for smaller products. We will include more accurate details of transport distances to specific customers, and not only average distance and average mode of transportation as of today.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

Requesting member
The Dow Chemical Company

Group type of project
Relationship sustainability assessment

Type of project
Assessing products or services life cycle footprint to identify efficiencies

Emissions targeted
Actions to reduce customers' operational emissions (customer scope 1 & 2)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
Other, please specify (This must be calculated during the project.)

Details of proposal
The Dow Chemical Company buys renewable specialty cellulose from Borregaard. Two possible approaches: 1)Replacement of cotton linters pulp(CLP) with sustainable wood based speciality cellulose will probably reduce the CO2 emissions and the overall environmental footprint for Dow. CLP, a by-product from cotton farming, is an alternative raw material for cellulose based products like ethers and acetate. CLP has a significantly larger environmental footprint compared to speciality wood pulp. 2)Assessment of the overall CO2 footprint from speciality cellulose including accounting of biogenic carbon compared with alternative fossil based chemicals. Make sure that the advantage of using a product that contains biogenic carbon is reflected in the calculation of scope 3 emissions.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?
Yes

SC2.2a

(SC2.2a) Specify the requesting member(s) that have driven organizational-level emissions reduction initiatives, and provide information on the initiatives.

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?
Yes, I will provide data

SC4.1a

(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.
100

SC4.2a

(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

1657_Lignosulfonate-liquid-Dustex_no_1(2).pdf
NEPD-2973-1657_Anhydrous-Bioethanol-99--(1)(1).pdf
NEPD-2972-1657_Vanillin.pdf
NEPD-3017-1686_Sodium-Hypochlorite.pdf
NEPD-3016-1686_Sodium-Hydroxide.pdf
NEPD-3015-1686_Hydrochloric-acid.pdf
NEPD-2975-1657_Lignosulfonate-powder-total.pdf
NEPD-2974-1657_Lignosulfonate-liquid-Dustex(1).pdf
The 2019 LCA of products from Borregaard Sarpsborg.pdf
NEPD-2971-1657_Speciality-Cellulose.pdf

Name of good/ service
Speciality Cellulose, se enclosed EPD for speciality cellulose

Description of good/ service
Borregaard's high purity speciality cellulose is used to produce a wide range of cellulose derivatives, with end uses ranging from tile adhesives, cement mortars, paint, printing ink and filters to food, pharmaceutical and cosmetic products. The speciality cellulose is based on the natural and renewable raw material Norway spruce. The products are safe to handle and store, thus no classification is required with respect to categories of danger, symbol letters or risk phrases.

Type of product
Intermediate

SKU (Stock Keeping Unit)

Total emissions in kg CO2e per unit
566

±% change from previous figure supplied

Date of previous figure supplied

Explanation of change

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
Products from Borregaard in Norway, ex Speciality Cellulose. EPD-3610-2301_Calcium-lignin-biopolymer-powder.pdf (epd-norge.no) NEPD-3616-2302_Dustex.pdf (epd-norge.no) NEPD-3611-2301_Calcium-lignin-biopolymer-liquid.pdf (epd-norge.no) NEPD-3612-2301_Sodium-lignin-biopolymer-A-liquid.pdf (epd-norge.no) NEPD-3613-2301_Sodium-lignin-biopolymer-A-powder.pdf (epd-norge.no) Sodium lignin biopolymer B liquid - EPD Norge (epd-norge.no) NEPD-3615-2301_Sodium-lignin-biopolymer-B-powder.pdf (epd-norge.no) NEPD-3015-1686_Hydrochloric-acid.pdf (epd-norge.no) NEPD-3016-1686_Sodium-Hydroxide.pdf (epd-norge.no) NEPD-2972-1657-EN EuroVanillin Supreme - wood vanillin (epd-norge.no) NEPD-2973-1657_Anhydrous-Bioethanol-99--(1)(1).pdf (epd-norge.no)

Description of good/ service
See attached information from the EPD's.

Type of product
Please select

SKU (Stock Keeping Unit)

Total emissions in kg CO2e per unit

±% change from previous figure supplied

Date of previous figure supplied

Explanation of change

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

SC4.2b

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

Name of good/ service
Speciality cellulose

Please select the scope
Scope 3

Please select the lifecycle stage
Transportation

Emissions at the lifecycle stage in kg CO2e per unit
387

Is this stage under your ownership or control?
Yes

Type of data used
Primary

Data quality
6000 km of transport to customer. Transportation to customer has been corrected to account for the burden of transporting water. Foreground data refer to the year 2019. For the background data, representative data from ecoinvent version 3.6 is used (Wernet et al. 2016).

If you are verifying/assuring this product emission data, please tell us how
The data is from the EPD, EPD's are verified by third party.

SC4.2c

(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.

Name of good/ service	Initiative ID	Description of initiative	Completed or planned	Emission reductions in kg CO2e per unit

SC4.2d

(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?
No

Submit your response

In which language are you submitting your response?
English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below
I have read and accept the applicable Terms