

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 82 percent of the feedstock to make biochemicals and biomaterials that can replace oil-based products. Most of the remaining biomass is converted to energy used in production processes. In addition to its biorefinery in Sarpsborg, Borregaard has five production sites outside Norway dedicated to producing lignin-based products. The company also has sales offices in 13 countries in Europe, Asia and the Americas serving its global customer base. At the end of 2020, the Group had 1,091 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 biopolymers and biovanillin from lignin, speciality cellulose, cellulose fibrils, fine chemical intermediates and second-generation bioethanol. The products are used in a variety of applications in sectors such as construction and building materials, feed and agriculture, food and pharma, personal care, batteries, biofuel, textiles 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, Borregaard has a strong focus on training programmes and cooperation between the various disciplines. Borregaard has a leading research centre combining various chemical disciplines, biotechnology and microbiology, developing new or improved products, applications and production technologies.

SUSTAINABLE BUSINESS MODEL

Sustainability, which include climate changes, is an integral part of Borregaard's business model.

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

The UN predicts population growth of more than 10% by 2030, which will generate resource scarcity and an extraordinary demand for climate friendly solutions for infrastructure, housing, energy, jobs and food production. 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 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.

Borregaard will, as a company, take climate action and demonstrate how its 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) provides a clear description of the world's challenges through the 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 joined the Science Based Targets Initiative and defined science-based targets that are in line with the ambitions in the Paris Agreement and well below the level required to limit the global temperature increase to 2°C.

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 Borregaard's products, throughout their entire life cycle. 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 with petrochemical alternatives. Borregaard has made efforts to reduce greenhouse gas emissions (42% from base year 2009) 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 2020	December 31 2020	No	<Not Applicable>

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

Czechia
Germany
Norway
Spain
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

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 Procurement Officer (CPO)	Senior Vice President, Procurement and Strategic Sourcing, and member of the Executive Management Group, is responsible for the main activities along the supply chain within climate-related issues in the Borregaard Group. Transition risks like increased raw material cost, energy cost and sourcing of renewable electricity is within her responsibility. The purchasing of biomass/wood, renewable energy, new renewable energy transportation solutions, climate friendly requirements of new installation and frame conditions for climate-related issues are also within her responsibility. A climate-related decision made in 2020 was to buy wood raw material that is 100% certified as in accordance with PEFC/FSC. In 2020 98 % of the wood was certified, the rest of the purchased wood are controlled according to the same standards. Wood is one of the few renewable raw materials that can be produced in large quantities. Forests are important from a climate perspective. While trees are growing, they capture and store CO2 from the atmosphere. As the trees grow old, they capture less CO2 and are ready to be harvested to become biomass for sustainable products that can replace oil-based alternatives. Today, Norway has three times as much forest as it did a hundred years ago. Every year the Norwegian forests, which have been meticulously monitored since the 1920s by the Land Resource Surveys, grow by 15 million cubic meters. If we use biomass to produce products we currently make from oil, we can save the planet from large greenhouse gas emissions. Buying certified wood ensures that the forests are managed in a sustainable way, from a climate and biodiversity perspective. Sustainable forestry is an important part of the achievement of the targets in the Paris Agreement.
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. A climate-related decision of the board was to decide to invest in increased production of the low-emission bio-based vanillin. The market for bio-based vanillin is growing rapidly. This trend is expected to continue and most likely be reinforced in parallel with the world's growing sustainability focus. In response to growing demand Borregaard is increasing the production capacity for wood-based vanillin. This expansion delivers at least 250 new tonnes annually of sustainable bio-based vanillin into the market. The vanillin expansion project has a total cost of NOK 130 million and will be completed in the end of 2021. Another climate-related decision of the board in 2019 was to invest NOK 131 million in a project aimed at increasing the use of bioenergy from production residuals at the Sarpsborg site in Norway. When completed in 2021, the bioenergy produced as a result of this project will be approximately 20 GWh per year, representing a reduction of CO2 emissions of 1,200 tonnes. In the longer term there is a potential to increase production to 34 GWh per year, and a corresponding reduction of 1,400 tonnes CO2 emissions. Enova SF, a state enterprise under the Norwegian Ministry of Climate and Environment, will support the project by a grant of NOK 46.2 million, thus reducing Borregaard's project cost to a net amount of NOK 85 million. The investment project will be finished in the beginning of 2022.
Other C-Suite Officer	Senior Vice President, Organisation and Public Affairs, and member of the Executive Management Group is in charge of the Sustainability board at Borregaard. The Sustainability board has the responsibility for assessing the Groups initiatives within sustainability and climate and for coordinating this work in the value chain, for presenting progress to the board and for writing Borregaard's Sustainability report. In 2020 several measures have been implemented to strengthen and develop the Groups business model from a sustainable perspective in the whole value chain. The Groups science-based target was approved in 2019 and more details have been put into the plans towards the targets in 2030 and 2050. A climate-related decision has been to increase the number of employees that has sustainability as their main responsibility, to increase focus on climate and sustainable communication of the products, life cycle analysis of the products and increased sustainability reporting according to new requirements from stakeholders and in line with the development in the EU Green Deal regulations. To extend reporting to CDP to include reporting on forests and water is example of one decision. The number of FTE working with sustainability within the company has been increased with 2 more FTE's.

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 – all meetings	Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable >	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.
Scheduled – some meetings	Setting performance objectives Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable >	In a yearly Board meeting, the Board decides the overall climate-related goals at Borregaard, and monitors the progress towards the mid-term and long-term science-based targets. 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.
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	<Not Applicable >	In some Board meetings, strategy, plans, policies, and budgets are reviewed, including climate-related issues within these topics.

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
Sustainability committee	<Not Applicable>	Assessing climate-related risks and opportunities	<Not Applicable>	More frequently than quarterly
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).

Sustainability committee

The sustainability committee (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 Board reports to the President and CEO. The member of the board represents 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, especially performance of products.
- Technical Service Manager, BioMaterials; Responsible for climate and sustainability communication in the BioMaterials sales organisation and towards customers, especially performance of products.
- 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.

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 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.

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.
- Transitional risk/opportunity data: Changes in framework conditions including funding of climate projects and energy costs in operating countries are monitored and evaluated.
- 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, has a bonus linked to energy efficiency target, in 2020 this bonus programme frame about 5-10% of salary, 50.000 NOK.

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 we are looking at the strategy for year n+1 to year n+3. In this reporting year 0 is 2020, year 1 is 2021. When we disclose data for climate to this report, we are in June 2021, which means that year n is 2021. 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 2020-2024, 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	11	Medium - Borregaard has committed to a Science based target (SBT) in 2030, the target is approved by SBT. Plan to realize emission reduction within this period is established and risks and opportunities related to climate change in medium-term is evaluated.
Long-term	11	31	Long - Borregaard has committed to a Science based target (SBT) in 2050, the target is approved by SBT. 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 2020 EBITDA was 1,132 mill NOK and in 2019, 1,007 mill NOK. The financial impact is defined as substantial within a short-term (3-years) period 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

In 2020 a loss in EBITDA of 50 mill, would have reduced the EBITDA margin by 0.90%-points from 21.2% to 20.3 %. A close to 1%-point 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.

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

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 (ISO 30001) and the implementation support for this multi-disciplinary risk management process, contribute to the identification, analysis and handling of risks across business areas and disciplines. Identify: To identify climate-related risk and opportunities in the whole value chain, the method from Task Force on Climate-related Financial Disclosures (TCFD) has been used as a framework. Each member of the Group Executive Management is responsible for identifying climate-related risks within their respective areas. To identify opportunities within development of low emission products, Borregaard has developed as strong market and R&D departments that work in close co-operation with the customers or potential customers. In our assessment of risk under different IPPC scenarios we have focused on the mid-term horizon, i.e. up to 2030. We have also studied reports with a wider scope, some of them try to assess effects up to 2100, and include scenarios with temperature increases up to nearly 4 degrees. For the operations in Norway we have used reports published by the Norwegian Environmental Authorities, i.e. "Consequences for Norway of transnational climate impacts, M-968 2018, EY" This is a "soft" type report, where the problems and opportunities are identified and discussed, but not in a quantitative way. The Norwegian Environmental Authorities has also published reports that are more specific and try to assess the effects in a quantitative way, which has also been an important input to the identify the physical risks in different scenarios and possible transitional risks consequences. Transition risk from changes in regulations like within EU-ETS, EU forest strategy, EU Green Deal. Assessment The assessment process is done by the responsible member of the Group Executive Management. The substantive financial impact when assessing all risks and opportunities are as described in C2.1b measured as an EBITDA effect. The aggregate risk picture is consolidated by the CRO and reviewed by the Group Executive Management before it is submitted to the Audit Committee and finally to the Board. The Board conducts a review of the Group's risk picture at least annually. Borregaard has identified processes to collect relevant data and seek information from partners in the value chain to secure an updated risk assessment. Relevant KPI's are assessed on a regular basis in management meetings and at Board level (energy price, CO2 emission, wood cost). Response to risk The response to the risk is within the responsibility of each member of the Group Executive Management or the one that has got the responsibility delegated • Borregaards response within opportunities are organised in innovation management teams, meaning cross functional teams from market, R&D and production are working together, sometimes also with the customer to develop low emission product opportunities. • Targets of relevant KPI's is monitored and progress of relevant mitigation activities. • Update progress plans in all areas to mitigate climate risks and capitalize opportunities, at least in the annual budget process. • Comprehensive risk assessments related to either operations or projects are carried out on an ongoing basis in all units and reported to the next management level, and significant risks aggregates into an overall risk picture. Case study transitional risks The risk was identified because of Borregaard relatively high exposure of fossil energy consumption (42% of energy consumption), this gives risk of high energy prices due to the carbon pricing mechanism and the risk of not achieving the Science based target for climate gas reduction which is important to develop the sustainable business model in the future. The assessment of the risk showed that the financial impact was within the range Borregaard define as substantive. Senior Vice President, Procurement and Strategic Sourcing is responsible for the risk (member of Group Executive Management). As a response to the risk, a Climate and Energy Committee reporting to the SVP has been established. The committee has monthly meetings to monitor the risk, risk mitigation activities and to update the risk picture. The Energy Director chairs the Committee. Several activities has been identified as a response to the risk: • Review development in energy prices, evaluating different energy alternatives. • Renewable energy consumption, progress in relevant KPIs. • Regulatory issues and changes in frame conditions in the area. Transfer the risk: • Progress in energy and CO2 emission reductions plans and targets established to be less dependent on fossil energy (Science based target) • Development in technologies for Carbon Capture and Storage •Borregaards holds a ISO 50001 Energy certificate, which enhance a systematic method to control and transfer the risk of energy cost. Case study physical risks Borregaard has some exposure to physical risk for logistics related to risk of flooding or dry periods, if this risk is not managed it has the inherent risk of interruption in production due to lack of raw materials or the supply of products. The assessment of the risk showed that the financial impact was within the range Borregaard has defined as substantive; it can give increased logistic cost and storage cost for raw materials and products. In worst case production or supply of products can be interrupted. Director of Borregaard's Sarpsborg site (member of the Group Executive Management) is responsible for the risk. Several activities has been identified as a response to the risk: • The logistics manager at the site in Sarpsborg and Borregaard's central function for Supply Chain management control the risk by coordinating the logistics and monitoring the risk of acute physical risk of flooding. •Logistic manager is responsible for planning storage volume and back-up transportation solutions in correlation with the risk picture. The risk can affect both upstream and downstream logistics. Ships transport raw materials and brings products to customers on the river Glomma to the productions site in Sarpsborg. When the water flow is above a certain level, ships cannot go to the port of the site. This will occur more often and for longer periods than before due to increased precipitation. •River Rhine is important for transportation at the site in Germany, it has been longer periods with dryer summer, and the water level has been too low for transportation of products by ship. To mitigate the risk, the production of those products can be switched to the operation in Norway, or alternatively transported by truck.

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. Example of the risk type: 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. scope 1 (and 2) emissions, which give a high exposure to current regulation: 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. 92% of the direct CO2 emissions are derived from the operation in Norway which hence is the most exposed to changes in carbon pricing regulation How the risk type is included in the climate-related risk-assessment: Because this is a risk associated with current regulation the mitigation of the risk is operational, and several risk mitigation activities has been implemented to increase renewable fuel usage and more energy efficient processes. 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	Rationale Emerging regulation: 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. Relevance in risk assessment: The specific guidelines and requirements for the taxonomy are still in the development phase and it is not clear how the different industries will be affected, but if not being taxonomy eligible, it can affect both the stock price and credit facility agreements. Example: Borregaard's biorefinery concept, with low-carbon emission products from natural renewable raw materials, makes a substantial contribution to the climate change mitigation. Our processes and products are integrated in value chains that supports and enables transitions to a circular economy. Innovation of new climate friendly products is an important enabling activity in alignment with taxonomy's definition of the manufacturing of low-carbon products. The reporting requirements for sustainable financing ("Taxonomy") in EU are under development, but it is still unclear how our business will be classified. We will now perform an assessment to identify which of our activities are taxonomy eligible and we monitor the EU process and will make necessary preparations for future reporting, but also mitigation activities. Framework conditions for energy and climate matters are changing rapidly. We expect policy changes, promoting the transition to a carbon-neutral society, to accelerate in 2021. Borregaard monitors and engages actively, e.g. in the development of the European Green Deal, in cooperation with European and national industry associations.
Technology	Relevant, always included	Rationale technology: To expensive and/or uncertain technology for development into low emissions society. Relevance in risk assessment: 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. Example: 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 litigate 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. Relevance in risk assessment: If we do not have the right processes in place to litigate 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. Example: 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 has to be calculated and verified, thus the legal requirements will increase.
Market	Relevant, always included	Rationale market: To meet demand for for the shifts in market towards more climate friendly and renewable products. Relevance in risk assessment: Do not have the right processes in place to exploit the opportunities in market for new climate friendly products. The market risk is the shifts in demand for climate friendly and low-emission products, when having the right processes in place this we will turn into an opportunity. Example: 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. Comparisons with competing products also confirm that Borregaard's wood-based alternatives provide a significantly better environmental performance than oil-based alternatives. We are using this information to increase market awareness of our sustainable products. Another 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	Rationale Reputation: 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. Relevance in risk assessment: Do not have the right processes in place to maintain and build a strong sustainability reputation, so that the 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. Example: • 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 neighborhood, 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 Borregaards sustainability performance is one reason for application for a job.
Acute physical	Relevant, always included	Rationale acute physical: Borregaard has most of its operation in Norway, where the acute physical effect of climate change is flooding/or heavy rain. Relevance in risk assessment: Do not have right process in place to protect infrastructure at the production facility that can be destroyed due to acute physical incidents like mudslide, heavy storms and rain. Example: The risk of mudslide at the production site at the production site in Sarpsborg, Norway has been investigated, and the areas with the highest risk are monitored. When new buildings or infrastructure are built this is accounted for. This risk is also mitigated by insurance solutions.
Chronic physical	Relevant, always included	Rationale chronic physical: Availability for wood in the Nordic region due to more wet harvest condition in winter season. This will occur gradually as a long-term trends towards a more wet winter climate in the Nordic region. This means that the big harvesting machines cannot be used because they will destroy the wet forest floor to much and are also too heavy to operate. This will limit the operating time for harvesting of wood to periods when the forest floor is dry enough or frozen to carry the weight of the machines. Wood needs to be supplied from areas far away or harvesting done in another way with lighter machines that are more costly to operate due to less capacity. Relevance in risk assessment: Do not have the right process in place to get enough wood for production of biochemicals and biomaterials at a reasonable cost due to the longer-term shifts in weather in the forest harvesting areas. If we are not able to source enough wood the production volumes will decrease or more likely we have to pay higher price for the wood raw material. Both of the risk will give a negative impact on operating revenue and the EBITDA. Example: To mitigate the risk Borregaard has longterm relations with major suppliers that secure supplier development and predictable supplier conditions. Borregaard continuously develops the wood logistics to secure supply channels for wood in the Nordic market, including the Baltic sea region, to increase the sourcing area and lower the landed cost for wood. There are few restrictions in the supply of wood to the site in Sarpsborg, where wood can be supplied by road, rail and sea. To mitigate the risk of increased price of wood raw material will our targeted investments improve our ability to make higher value-added products. By focusing our efforts on innovation and productivity, we can increase the value added from our unique biorefinery in Sarpsborg, Norway. By increasing the value added pr solid m3 wood , means that Borregaard can accept higher wood prices compared to other competitors. Another more long term risk mitigation activity is to develop other types of bio-based raw materials that can be used as alternative. Borregaard has developed and patented the BALI concept. BALI™ is a biorefinery concept, developed by Borregaard for production of cellulosic sugar and ethanol and lignin performance chemicals. The BALI™ technology has been scaled up and demonstrated in a 1 mt/day feedstock demo plant in Sarpsborg.

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) 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
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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's uses about 700 GWh of fossil fuel for energy production (2020), thus exposure for CO2 cost of energy due to carbon pricing mechanisms is substantial. Borregaard's operation in Norway is within the EU-ETS system and holds a permit for climate gas emissions from the Norwegian Environment Agency. The site receives free CO2-allowances in the period 2012-2020, and in the period 2021-2025. The inherent risk of high climate cost due to EU-ETS has been mitigated by investing in renewable energy sources and improving energy efficiency at Borregaard's Sarpsborg operations. During the past decade, the Borregaard in Sarpsborg has implemented an energy strategy to replace the use of heavy fuel oil with more climate and eco-friendly energy sources. 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.

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)

46500000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The potential financial impact of increased operating cost due to increasing price of GHG emissions is calculated from the scenario that Borregaard had got no free climate gas allowances and no energy/climate reduction measures were implemented. The financial impact is calculated as an inherent effect of the EBITDA in 2020. EU-ETS Climate gas emissions level as base year 2009 was 176,000 ton/CO2 and internal carbon pricing as C11.a., 264 NOK/ton derived from average cost for climate allowances in 2020. The carbon price is calculated as ICE EUA front month and changed to Norwegian currency NOK. In 2020 the average carbon price used was NOK 264/ton CO2, maximum was NOK 353/ton CO2 and minimum was NOK 172/ton CO2. Potential financial impact figure: Financial impact cost per year emission if no energy/climate reduction measures and if no free allowances (EUA) was obtained: 176,000 ton CO2 * 264 NOK/ton = NOK 46,5 mill /year Financial risk mitigation: Reduction (because of investments) in climate gas emissions to 2020 level: 118,200 ton CO2 * 264 NOK/ton = NOK 31,2mill /year Borregaard has free climate gas allowances (EUA) in the period 2013-2020: Actual cost: 118,200 ton CO2* 0 NOK/ton= 0 NOK/year. Due to the risk mitigation activities the actual effect on EBITDA 2020 is 0 NOK/year After 2020 Borregaard will have free allowances for the period 2021-2025. The cost of EUA 's is expected to increase, 300-600 NOK/ton, thus the impact will increase. Uncertainty persists regarding the indirect CO2 compensation regime for the 2021-2030 period, e.g. related to the list of eligible sectors and national pass-through factors. Ultimately, this will have bearing on the effective electricity costs, and hence the global competitiveness, of European electricity-intensive industries. Borregaard will still receive some compensation in the period 2021-2025.

Cost of response to risk

134600000

Description of response and explanation of cost calculation

Borregaard in Sarpsborg mitigates the risk of increased indirect (operating) cost for energy, due to increased carbon price, by the company's active strategy for increasing amount of renewable energy and energy reduction, the implementation of the strategy started more than 15 years ago. Example: 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 as fuel was exchanged with LNG and biogas, which reduced the CO2 in the energy mix 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 target, CO2reduction 55% in 2030 and 100% in 2050 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. In addition 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: CAPEX 65 + 18 + 12 +4,5 +26,6 + 5,2 + 2,3 = NOK 133,6 mill + 1 FTE for managing risk response: NOK 1 mill = NOK 134,6 mill

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Upstream

Risk type & Primary climate-related risk driver

Acute physical	Increased severity and frequency of extreme weather events such as cyclones and floods
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Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

The river Glomma is important for supply of raw materials to Borregaard's site in Norway by boat. Raw materials like salt, wood, limestone, sodium hydroxide and sulphuric acid is supplied by boat to Borregaard's own port, Melløs. In Norway, where Borregaard's biorefinery is located, the precipitation will increase through the whole year, and the frequency of the acute physical risk of flooding in the river Glomma will increase. (Ref: Vormoor, K., Lawrence, D., Schlichting, L., Wilson, D. & Wong, W.K. (2016) Evidence for changes in the magnitude and frequency of observed rainfall vs. snow melt driven floods in Norway Journal of Hydrology, 538, 33–48, doi:10.1016/j.jhydrol.2016.03.066). Borregaard own port at the site, Melløs, in the river Glomma, will be closed more days during the year, not only spring time where risk of flooding is higher due to snow melting in the mountains, but also in autumn due to increased precipitation. The average flow of the river Glomma is 577 cbm/sec, the port is closed when the flow increases to 1500 cbm/sec. Flooding impact the the logistic cost (operating cost) for the supply of raw materials, which increase when the port Melløs closes. Ships have to go to other ports, and we will have extra cost from unloading, handling and transportation of the goods by trucks to Borregaard site in Sarpsborg, from other ports. For some raw materials/chemicals this is not possible, and it will be risk of shortage that can result in production downtime. As a part of the contingency plant it is also possible to increase storage volume for some of the raw materials, if we know early enough that it is likely that flooding might occur. At our operation(plant for spray drying of lignin) in Germany, Karlsruhe, which is close to the river Rhine, we have experienced that the opposite phenome to flooding, drought has resulted in increased operating cost. Some of the transportation is on the river Rhine. In dry summers, like 2018, the water level was too low to enable transportation and the transportation cost increased. We expect that this will occur more frequent in the future. In our contingency plan we have identified that we can source from Borregaards other lignin plants in Europe or North America.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

4400000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The potential financial impact is calculated from increased unloading and transportation costs at Borregaard in Sarpsborg, the main production site and the risk of flooding in the river Glomma. Costs will increase, because the Borregaard's port in the river Glomma will be closed more days during the year, not only spring time, but also in autumn. The port closes at a water flow of 1500 cbm/Sec. At the current situation the number of days closed are for the 3 last years 2.87 days in average. Extra costs for unloading ship in another port downstream the river and transportation to the site in Sarpsborg is in average 200,000 NOK per boat. We assume that number of days increases with 7 days to total of 10 days, and one boat each day in a medium term horizon. Cost calculation: 200,000 NOK pr Boat * 7 extra days = 1,4 M NOK. Potential increased storage cost close to the plant is estimated to 3 mill NOK/year (rent of more storage capacity). The total financial impact is then: Increased unloading cost 1 mill NOK + Increased storage cost 3,4 mill NOK = 4,4 mill NOK Borregaard have different sources for lignin raw material in Europe and North America, so when its not possible to get raw material to the plant in Germany, it is possible to dry the lignin raw material elsewhere, so in this case we have calculated the financial impact of drought in the river Rhine as negligible.

Cost of response to risk

500000

Description of response and explanation of cost calculation

Borregaard's primary response for mitigating the risk of increased transport cost of raw materials and chemicals due to acute physical incidents is have a business continuity plan with alternative logistic solutions, extra capacity to increase storage volumes and alternative suppliers. Example Plan/Activities: The logistic manager at Borregaard's operations in Sarpsborg, Norway is responsible for the logistics at the site and are responsible for the contingency plan for managing the impact of flooding on our direct operations from supply chain. Planning of storage volume and backup transportation solutions in correlation with the prognoses of water flow in Glomma. This information is received by The Norwegian Water Resources and Energy Directorate, they are monitoring the long term trend (weeks), and will provide Borregaard with prognosis. As alternatives other ports will be used or transportation with rail/truck. Cost calculation: The risk process and the operation of the logistics will be covered within

normal operation for logistics. The management cost of handling the contingency plan is estimated to 0,5 FTE which is 500,000 NOK. Total cost: 0,5 FTE NOK 0,5 mill

Comment

Identifier

Risk 3

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 valueadded products. By using the different components of wood, the company produces lignin products, 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. Because the products are made from wood, they have documented low CO2 footprints compared to alternatives from oil. Forest are important in a climate perspective, while trees are growing, they capture and store CO2 from the atmosphere. As the trees grow old, they capture less CO2 and are ready to be harvested to become biomass for sustainable products that can replace oil-based alternatives. The market for wood based products is increasing in connection with transition to a more bio-based society, because of the positive impact on reduction in climate gas emissions. This could also tighten the competition for wood and give increased cost of the wood raw material. Borregaard source wood from the Nordic Region, and there are several new initiatives from other business that will produce biofuel or biobased products from the same raw material. There is a limited amount of wood available in Norway for new business in the markets where Borregaard sources wood from (Ref: Process 21 Ekspertgruppe rapport, Biobasert prosessindustri, 2020). Increased capacity in the biobased industry and restriction in harvesting activities will put pressure on the prices for biomass in our supply area, hence the cost of the raw material will increase. At present the supply area is in balance, but with further new investments in biobased industry it will be a lack of wood. In addition, the change in physical climate condition to milder winters will give more challenging harvesting and supply conditions, and may result in less wood supplies or increased cost for wood in the Nordic region (risk 2). 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, thus Borregaard buy certified wood accordance to PEFC/FCS, 98% of the wood purchased in 2020 was certified. The rest of the purchased wood was controlled in accordance with PEFC/FSC®11

Time horizon

Medium-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)

200000000

Explanation of financial impact figure

If the demand for wood increases the operating cost of wood will increase due to the limited amount of wood that is available for harvesting. 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 can increase between NOK 50 and NOK 200 pr solid m3. With a consumption of 1 mill m3 the financial impact will an increase in the direct cost between 50 – 200 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. Borregaard uses 1,000,000 solid m3 ea. year. The potential financial impact figure minimum is 1,000,000 solid m3 ea. year times NOK 50 = NOK 50 mill. The potential financial impact figure maximum is 1,000,000 solid m3 ea. year times NOK 200 = NOK 200 mill.

Cost of response to risk

1100000

Description of response and explanation of cost calculation

Borregaard's response for mitigating the risk of increased cost of biomass/wood, is to have many different suppliers and alternatives for logistics and to maintain the volume in the market, by securing that the growth and harvesting is sustainable. As long as forests are managed in a sustainable way, it will be an everlasting resource for production of bio-based products. Example risk response: • Borregaard is a major purchaser of wood in Norway, in 2020 we bought almost 0,8 mill sm3 of wood in a market of about 11 mill sm3. Borregaard has established a policy to buy certified wood accordance to PEFC/FCS, which mean that the suppliers must handle the forest resource in a sustainable way so the volume in the market will be maintained thus same price • To secure the supply of wood, Borregaard has long term contracts, more than 3 years, which also give time for development of the supplier because of predictable conditions. • Borregaard 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. • Flexible wood transport to the site in Sarpsborg, by truck, railway and boat, gives no restrictions in supply, thus suppliers can accept somewhat lower price for the wood. • Transport cost in Norway, engagement with policymakers for prioritisation of investment in infrastructure for transport, lower transportation cost in the future. • Borregaard is more flexible than other players in the wood processing industry when it comes to quality/freshness requirements of wood. A substantial part of the spruce needed can be old/dry and is not well suited for other wood processing Long-term activities to reduce risk for higher competition for biomass: Borregaard R&D has developed the patented BALI concept as a long-term/medium-term option for

additional raw material supply, allowing the extraction of lignin based products from various bio masses, including agricultural waste. This may give a higher flexibility for raw material sources in the future. Development of the concept was finished before 2020, no cost in 2020. Cost in 2020: The position as Director Wood sourcing, responsible for risk response activities above, one extra manning, one FTE. 1 FTE = NOK 1 mill. Cost of wood certification (PEFC/FCS) =NOK 0,1 mill R&D cost for BALI related activities = NOK 0 mill Total Cost: 1 + 0,1 + 0 = NOK 1,1 mill

Comment

There is a limited amount of wood available for new businesses. Today approx. 11 million fm³ wood are logged as saw logs and pulpwood in Norway. Of this volume, approx. 2.3 million fm³ ends up as sawn wood, approx. 5 million fm³ is used as raw material for industrial processes and energy production in Norway and approx. 3.6 million fm³ are exported, mainly to Sweden. At the same time, 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. Thus, there is a significant gap between potential access of up to 5.5 million fm³ and Norwegian industrial ambitions (Ref: Process 21 Ekspertgruppe rapport, Biobasert prosessindustri, 2020). Borregaard has increased its value creation in NOK pr solid cubic meter wood from NOK 800 pr solid cubic meter in 2014 to NOK 1200 pr solid cubic meter in 2020. Borregaards production outside Norway receive lignin raw material from pulp mills. Carbon pricing mechanism has resulted in increased demand for bio energy, and for some suppliers it could be more beneficial to sell/use it as bioenergy, instead of selling the lignin to high value biobased products that can replace oil based, which is a much better alternative in a climate perspective. This risk is also monitored closely by Borregaard.

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

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Borregaard produces second generation bioethanol at its production facilities in Sarpsborg. The minimum content of biofuel in fuel for road traffic will increase to 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 technology that have been installed has reduced the specific energy use in the plant by 67%, thus reducing the CO₂ footprint of the bioethanol produced. The plant has since been subject to continuous improvements. In 2019, Borregaard's second generation bioethanol achieved ISCC EU sustainability certification. The certification was successfully renewed in 2020. The continuous change in the regulations for biofuels in fuel for road traffic represents an important transitional climate opportunity for Borregaard, which has resulted in investments to mitigate the demands in a new and emerging market.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-low

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)

6000000

Potential financial impact figure – maximum (currency)

12000000

Explanation of financial impact figure

The demand for Borregaard's second generation bioethanol has increased due to the requirements of increasing content of biofuel in fuel for road traffic. Borregaard has increased the production capacity of 99% (absolute) bioethanol after realization of an investment in the bioethanol plant in 2018. The plant has since been subject to continuous improvements to enhance the production capacity and reduce waste factors. The capacity of the plant was increased by approximately 11-12 million liters of 99% bioethanol, which then increased the contribution margin of NOK 12 mill/year. The contribution margin will increase in the short-term period (2020-2023) due to increased sales volumes and potentially better sales prices. We have estimated a range for the financial impact on the annual EBITDA improvement in the end of the short-term period. The fixed cost factor and the sales volume are the same in both the minimum and the maximum potential. In the calculation of potential financial figure minimum, we have used the lowest expected average sales price times volume which gives a positive effect on EBITDA of NOK 6 mill. compared with EBITDA 2020. In the

calculation of the potential financial figure maximum, we have used the highest expected average sales price times volume which gives a positive effect on EBITDA of NOK 12 mill. compared with EBITDA 2020. The financial impact is in the low range of our definition of substantial financial impact, but this case represents an important case for the company to demonstrate its ability to meet transitional opportunities due to climate changes.

Cost to realize opportunity

48200000

Strategy to realize opportunity and explanation of cost calculation

Activities within strategy to realize opportunity: 1. Borregaard has the knowledge and the technology to further develop bioethanol production at the site in Sarpsborg (convert 94-96% bioethanol to 99% bioethanol). 2. The requirements in the Fuel Quality Directive and the Renewable Energy Directive has increased the demand of content of biofuel in the fuel for road traffic. This was an important factor for the investment decision. 3. Engagement with policy makers to secure that second-generation bioethanol from wood pulping will count double when used in fuel - double counting bioethanol has a higher market value. 4. Conducting LCA analyses to document that bioethanol from wood pulping (Borregaard) has the lowest CO2 emissions compared to all other types of biofuel and meets the sustainability criteria, has also been important. Both to illustrate and prove the sustainability benefits of the product and to increase the market value. 5. External funding of project. The project of NOK 63 million in total, was awarded a grant of NOK 18.9 million from Enova, a Norwegian government agency which promotes environmentally friendly restructuring of energy end-use, renewable energy production and new energy and climate technology. 6. ISCC EU certification of bioethanol to be able to access new markets for biofuel. Explanation of cost calculation: The CAPEX for the project was NOK 48 mill (net after funding). The OPEX has not been increased, and there was no extra cost for sales and marketing activities. The ISCC EU certification/recertification is an extra annual cost of NOK 0,2 mill. Tot cost: NOK 48 mill + NOK 0,2 mill = 48,2 mill. The plant was officially opened by the Climate and Environmental minister of Norway in February 2019.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues resulting from increased production capacity

Company-specific description

Borregaard is the world's leading supplier of biopolymers used as binding and dispersing agents, delivering sustainable alternatives to petroleum-based chemicals. Borregaard has over 60 years of experience in biopolymers based on lignin. Our environmentally friendly products in Biopolymers are used in a wide range of end-market applications, such as agrochemicals, batteries, industrial binders and construction. A global network of production facilities and sales offices assures the very best local service and competence where you need it. In June 2018, Borregaard, together with a partner, opened a new lignin plant in Florida, LignoTech Florida. The plant in Fernandina Beach is owned by Borregaard (55%) and Rayonier Advanced Materials (45%), and currently has a production capacity of 100,000 metric tonnes (MTDS) biopolymers. Customers can benefit from sustainable, bio-based products, shorter lead times and optimized sourcing from multiple plants. The expansion project is built on the assumption that the demand for sustainable and low carbon emission products will increase. The plant is now in the completion phase of a 3 year ramp-up period, where the sales volume is heading towards the capacity of 100.000 MTDS and several other measures are increasing: During 2020, the export from the plant increased to 29 countries, from 12 countries in 2019. The production volume has also increased with 45% from 2019 to 2020. The plant launched 11 new products in 2020, and the number of customers increased from approx. 100 in 2019 to >200 in 2020. The number of segments sold increased from 25 in 2019 to 30 in 2020. Additional 2 jobs were created in 2020, to a total of 60 jobs, contributing to the local and US economy.

Time horizon

Short-term

Likelihood

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)

100000000

Explanation of financial impact figure

A ramp-up of the production towards a full capacity of 100,000 metric tons of lignin measured as dry substances is close to completion. The capital expenditure for the plant built in 2018 was NOK 890 mill, under the assumption of minimum 15% IRR pre-tax, which means an annual EBITDA (operating profit before depreciation for Borregaard Group) above 134 mill NOK when the capacity is fully utilized. However, the financial performance of the operation has so far been below expectations and it will be challenging to reach the 15% IRR pre-tax target of NOK 134 mill in EBITDA in the short-term period (2024). The contribution margin will increase in the short-term period due to optimisation of sales volume and improved product mix. Improved product mix will result in increased average sales price. We have estimated a range for the financial impact on the annual EBITDA improvement in the end of the short-term period. In the calculation of the potential financial figure minimum we have used the lowest expected sales volume and sales price minus the highest expected fixed cost NOK 120 mill, which gives a positive effect on EBITDA of NOK 50 mill. For the potential financial figure maximum we have used the highest expected sales volume and sales price minus the lowest expected fixed cost of NOK 100 mill, which gives a positive effect on EBITDA of NOK 100 mill.

Cost to realize opportunity

1440000000

Strategy to realize opportunity and explanation of cost calculation

Executive Vice President Biosolutions is responsible for the strategy to realize the opportunity. The strategy for the short-term period is commercialisation and specialisation.

In order to achieve the planned sales ramp-up, several activities are implemented: • Innovation through new product offerings and improved performance and quality within existing and new market areas. Strong innovation efforts are one of Borregaard's strategic priorities. Borregaard's R&D and innovation efforts in 2020 represented 3,6% of the company's revenues. The innovation rate for 2020 was 17,7%. • Research and development activities to be able to utilise new sources of sustainable plant-based materials, other than wood. • Market activities to realize customers' ability to capture the sustainability benefits of a bio-based product. • Expansion of customer base in new applications and geographical markets. The location of the plant in Florida benefits existing and potentially new customers, especially in the North, Central and South America regions. • New production and market organization to deliver new products according to the strategy above: Number of new FTE= 60, NOK 60 mill per year. Five products coming out of the LignoTech Florida site has earned the USDA certified bio-based product label. These are products sold as among others as dispersants in crop protection formulations, plasticizers into concrete as well as binders used in animal feed pellets. In crop protection formulations and in concrete admixtures the products can replace petrochemical alternatives and reduce the environmental footprint. Third-party verification for a product's bio-based content is administered through the USDA BioPreferred® Program. One of the goals of the BioPreferred Program is to increase the development, purchase and use of bio-based products. Cost to realize opportunity: Tot cost: The capital expenditure of the project was NOK 890 mill + the yearly fixed cost is NOK 110 mill (include costs of sales and marketing organization FTEs and production annually) times 5 years (2020-2024)= NOK 550 mill . The total cost to realize the opportunity is then: NOK 890 mill + NOK 550 mill = NOK 1440 mill.

Comment

Identifier

Opp3

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

In 2014, Borregaard decided to invest in a facility for the production of Exilva microfibrillar cellulose (MFC) at Borregaard in Sarpsborg. The investment was NOK 225 million and was finished in 2016. Borregaard has developed Exilva, which is based on natural and renewable raw materials. It has the potential to replace products derived from petrochemicals, and it also represents an opportunity to exchange organic solvent systems with water-based solutions. The world's growing population together with climate changes gives opportunities for more sustainable crop solution and protection, Exilva can be used for pesticides, performing as a multi-functional additive in agricultural chemicals, as well as increasing formulation efficiency and reducing the CO2 footprint in the downstream value chain. Through extensive testing, Exilva has shown that it can boost the effect of many herbicides and is powerful against impermeable weeds. Combining pesticides and fertilizers before applying them to the field potentially provides for huge savings for the farmer as well as a reduction in CO2 emissions from the tractors as combining the products means less trips on the fields. Unstable tank mixes and clogging of nozzles are the key challenges when trying to make the fertilizer and pesticide mixes. Borregaard has, together with a US partner, developed an additive with Exilva that overcomes these issues. Large scale field trials and regulatory registrations are currently ongoing. Exilva is a completely natural product, making it safer to use and providing our customers with a new world of performance enhancement within agricultural chemicals. Borates are classified by ECHA as substances of very high concern, suspected of damaging fertility and the unborn child. Until recent there have been no sustainable alternatives available to the industry to replace borates. Borregaard has, together with partners, demonstrated through laboratory work and factory trials, that Exilva can replace borates in certain adhesive systems for packaging products. It is of particular interest to brand owners of consumer products to improve the sustainability of their packaging materials. Acrylic copolymers are today used as thickeners in a lot of personal care and home care cleaning products. The industry would like to replace these additives with a more sustainable solution. Through close cooperation with customers Exilva has successfully replaced these copolymers in certain cleaning products

Time horizon

Short-term

Likelihood

More likely than not

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)

100000000

Explanation of financial impact figure

Sales will gradually increase, but long lead times for conversion of sales prospects are expected. The financial impact is uncertain at present, but the decision to invest NOK 225 mill in a plant for 1,000 tonnes (dry matter) of Exilva was under the assumption of minimum 15% IRR pre-tax, which means an annual EBITDA (operating profit before depreciation for Borregaard Group) above 35 mill NOK when the capacity is fully utilised. The contribution margin will increase in the short-term period (2024) due to increased sales volume. Based on two scenarios for sales volume and fixed cost, we have estimated a range for the financial impact on the annual EBITDA improvement in the end of the short-term period to NOK 50-100 mill. The fixed cost range is NOK 75 – 100 mill NOK pr year. In the calculation of potential financial figure minimum, we have used the lowest expected sales volume times sales price minus the highest expected fixed cost of NOK 100 mill, which gives a positive effect on EBITDA of NOK 50 mill. For the potential financial figure maximum, we have used the highest expected sales volume times sales price minus the lowest expected fixed cost of NOK 75 mill, which gives a positive effect on EBITDA of NOK 100 mill.

Cost to realize opportunity

625000000

Strategy to realize opportunity and explanation of cost calculation

Activities within strategy to realise opportunity started up in 2005: • Borregaard's project to develop Exilva MFC started in 2005, and the R&D work has partly been carried out in a pilot plant at Borregaard in Sarpsborg. • The development work has taken place in close cooperation with potential customers, in many different markets as agriculture, construction, paper & packaging, personal care, paints and coatings. • Conducted LCA analysis to document the climate advantage of the product. • In 2014 Borregaard's Board of Directors decided to invest in a facility for the production of Exilva microfibrillar cellulose (MFC). • In 2016 Borregaard finished a NOK 225 mill plant in Sarpsborg for the production of Exilva products for industrial applications, 1,000 tonnes annual capacity. • Support from EU Horizon 2020 to commercialise Exilva

MFC/contribute to the innovations cost, EUR 25 mill was granted. In this case we have looked at what need to be done of activities in the short-term period to be able to realize the EBITDA of the investment in the short-term period. Exilva products are in a market introduction phase. The main activity to realize the opportunity is to identify and establishing potential customers (prospects) by developing their needs. In 2020, it was 24 people working on R&D and sales & marketing within Exilva. More and more prospects have been converted to customers (long lead times) and this is also the focus going forward and is an important part of the strategy. Cost to realize opportunity Investment in new bio-based products; Borregaard has built a NOK 225 mill plant in Sarpsborg for the production of Exilva products for industrial applications. The innovation and marketing costs to realise the opportunity come in addition to the investment cost. The short-term period fixed costs (R&D, sales & marketing, and production) are expected to be NOK 75 - 100 mill annually to realise the opportunity, and according what we obtained for 2020. The calculation of fixed cost is starting from 2020 to the end of the short-term period 2024. The cost to realize the opportunity in the short-term period : Investment cost NOK 225 mill + Fixed cost 2020-2024 NOK 400mill = 625 mill NOK

Comment

Worlds growing population together with climate changes gives opportunities for more sustainable crop solution and protection, so the market for Exilva could be consider as a response to the physical climate change. Exilva is completely natural and infinitely sustainable and trough extensive testing, Exilva has shown that it can boost the effect of many herbicides and is powerful against impermeable weeds. EU's Single Use Plastic Directive triggers a lot of new innovations in food packaging to replace plastic coatings as water and oxygen barriers. Exilva offers an opportunity to replace plastic polymers used for oxygen barriers and several trials are ongoing in this field.

Identifier

Opp4

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

Bio-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. 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 Borregaard's vanillin is now focused around three key factors; - Natural raw material, the product is made from wood (Norway spruce). - The wood used to produce vanillin are all sourced from certified forests. - Documented sustainable product, a LCA (Life cycle) analysis has been conducted for vanillin produced at Borregaard, and is documenting 90% lower CO2 footprint compared to oil based vanillin. - Unique flavour, the product has subtle but important flavour differences versus other types of vanillin. With the positive trend as outlined above, the board of directors in Borregaard 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 will be completed in 2021.

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 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, which is NOK 20 mill in EBITDA. The EBITDA impact at the end of the short-term period (2024) will thus be minimum NOK 20 mill , mainly driven by increased contribution margin of NOK 23 mill , partly offset by an increase in fixed costs of NOK 3 mill.

Cost to realize opportunity

142000000

Strategy to realize opportunity and explanation of cost calculation

Two factors are critical to make the project succeed. Firstly; to achieve the planned capacity increase within time, quality and budget, and secondly; to be able to sell the increased volume at attractive prices. An experienced project team with a project leader with more than 20 years project experience in Borregaard is heading the investment project (MaxSupreme). A steering committee with senior managers from production, purchasing, market, finance and a union representative is overseeing the progress of MaxSupreme in bi-monthly meetings. Progress is also reported and monitored by the board of directors. Preparation for selling the volume into the market is done by the global sales and marketing team of Biovanillin and followed up by a steering committee with members from the Group management team including the President and CEO. Existing customers, interested in buying increased volume have been identified and a mutual update on market and capacity increase is done on a regular basis. An initiative to sell into new applications like personal care has been started and contacts and testing with potential customers and applications are in

progress. The capacity expansion is expected to be absorbed 80% by existing customers and 20% by new applications/new customers. There will be some extra cost for inbound marketing to realize the opportunity, the cost is estimated to additional 0,75 FTE , NOK 0,75 mill, this is within the total fixed cost of NOK 3 mill. The key cost component in realizing this opportunity is the investment in new capacity. The breakdown of the 130 mill NOK investment is as follows: 50% in equipment and machinery, 25% in buildings, 15% in piping, instruments and electric installations, 10% in miscellaneous. When the new capacity starts there will be a yearly increase in fixed cost of 3 mill NOK. The cost to realize the opportunity in the short-term period (2024): Investment NOK 130 mill + Fixed cost 2021-2024 NOK 4 times 3 mill: Tot cost: NOK 130 mill + NOK 12 mill = NOK 142 mill

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Is your organization’s low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	No, but we intend it to become a scheduled resolution item within the next two years	

C3.2

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

Yes, qualitative and quantitative

C3.2a

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

Climate-related scenarios and models applied	Details
RCP 2.6	<p>Our Science Based Target (SBT) is based on the scenario RCP 2.6 in IPCC's ARG WGIII, chp 6, table 6.3, page 431. It was identified through the Paris Agreement, RCP 2.6 is likely to keep global temperature rise below 2 °C by 2100. Given the lowest overshoot (<0.4 W/m2) the global emissions must be reduced by 49-72% by 2050 from 2010 levels in order to have a 12 to 22% chance of stabilizing temperatures below 2°C temperature increase relative to the preindustrial temperature. 72% reduction over 40 years implies an average of 3.13% annual reduction. This level of contraction is used as an absolute minimum, and both mid-term and long-term target are well on the ambitious side of this annual reduction. This time horizon is relevant to Borregaard because the time horizon of RCP 2.6 is the same as our SBTs, which is set at base-year (2009) with a 53 % reduction by 2030 and a 100 % reduction by 2050, and includes 100 % of Scope 1 and 2 emissions. The target boundary includes biogenic emissions and removals associated with the use of bioenergy. Our SBT for absolute Scope 3 GHG emissions are 30% by 2030 and 75% by 2050 from a 2017 base-year. Thus, the target can be interpreted as in line with the decarbonisation required to stabilize the global temperature to less than 2°C over preindustrial levels. The target can therefore be considered a "science-based" target. The results of our work with the IPCC scenarios gave us the knowledge and input Borregaard needed to set our new SBT which is included in our business strategy. Delivering on our science-based targets for reducing greenhouse gas emissions and producing products with a low CO2 footprint is one of our main priorities (SDG 13). Thus, the results of this scenario analysis have directly influenced our business objectives and strategy. Example: The result of the scenario analysis has led Borregaard to establish a long-term climate and energy strategy in which appropriate emission reduction activities, such as oil has been replaced by use of more climate friendly and renewable energy sources, while energy consumption in the operations has decreased as a result of energy efficiency measures. Our direct emissions stem mainly from the production of heat energy both as steam and as direct use for drying of lignin biopolymers from liquid to powder. We have identified several measures to reduce greenhouse gas emissions linked to consumption of heat energy in the years to come, such as further reductions in energy consumption and increased use of bioenergy and electricity from renewable sources. The specific energy consumption pr ton of cellulose produced has decreased with 8 % from 2016, the amount of biogas used for drying of lignin has more than doubled since 2016. Some of the measures, like electrification of drying process and utilisation of the bioenergy from own bark, will be implemented within 2030, other measures will depend on technology development and governmental support. Development in technologies for Carbon Capture and Storage (CCS) or sustainable Carbon Capture and Use (CCU) may be a prerequisite to achieve the target in 2050. Therefore, Borregaard's biorefinery in Norway has signed an agreement with a cluster of companies in the region, and a feasibility study of technologies and value chains for CCS started up in 2020. The increasing need for renewable electricity in society could represent a challenge when it comes to replacing fossil-based energy sources, thus we are continuously looking to enhance the redundancy of Borregaard's energy system and facilitate flexibility in our electricity consumption.</p>
IEA Sustainable development scenario	<p>IEA Sustainable development scenario: 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. Here, the location based methodology is used, and 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 Borregaard where the SBTs are set at base-year 2009* with a 53 % reduction by 2030 and a 100 % reduction by 2050, and includes 100 % of Scope 1 and 2 emissions (*the target boundary includes biogenic emissions and removals associated with the use of bioenergy). Our SBTs for absolute Scope 3 GHG emissions are 30% by 2030 and 75% by 2050 from a 2017 base-year. In this scenario 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 in Norway. 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 (SRMC) of coal and gas fired power plants in Europe and 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 price for CO2allowances under the EU ETS. Thus, both fuel prices and CO2 prices have an impact on power prices in Norway and represent a significant financial risk as long as these fossil-based power plants set the market price on the margin. 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 – either directly or indirectly – is necessary to meet our SBTi 2030 and 2050 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. Framework conditions for energy and climate matters are changing rapidly. We expect policy changes, promoting the transition to a carbon-neutral society, to accelerate in 2021. 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 conclusion from the initiative of Process21, a forum that has been established by the Norwegian government. 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.</p>

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	<p>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 2024. It is likely that this strategy will continue. The most substantive strategic decision: Borregaard has invested close to NOK two billion in the period 2015-2020 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.</p>
Supply chain and/or value chain	Yes	<p>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. Borregaard has committed to reduce indirect greenhouse gas emissions by 30 percent by 2030 and 75 percent by 2050 from a 2017 base year to take action and contribute to solve the global challenges described in the IPCC report. The targets have been approved by The Science Based Target initiative (SBTi) 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 the target was approved by SBTi in 2019. 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- and long-term. A broader and more focused approach to sustainable transport has led 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.</p>
Investment in R&D	Yes	<p>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 2024. 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 2020 amounted to NOK 193 million. This represents 3.6% of the company's revenues. The development of new bio-based products continued and the innovation rate for 2020 was 17.7%. Since Borregaard's products are part of the future demand for climate friendly products, Borregaard receives external funding: In 2020, Borregaard recognised NOK 40 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.</p>
Operations	Yes	<p>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. 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. The Science Based Targets Initiative (SBTi) has approved Borregaard's target of reducing greenhouse gas emissions by 53% by 2030 and 100% by 2050, from a 2009 base year (scope 1 and scope 2). Long-term time horizon : The strategy of reduction started 15 years ago and the time horizon is the Science based target in 2030 and 2050 . The most substantive strategic decision: In 2018 Borregaard committed to a SBTi, and the target was approved by SBTi in 2019. 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 energy like electricity from hydropower and wind, and the use of more biogas and bark for energy purposes. In addition there is a potential to make the operations even more energy efficient and save more CO2. Development in technologies for Carbon Capture and Storage (CCS) or sustainable Carbon Capture and Use (CCU) may be a prerequisite to achieve the target in 2050. Borregaard in Norway has signed an agreement with a cluster of companies in the region to make a feasibility study of technologies and value chains for CCS. The Borregaard Group has reduced its direct CO2 emissions by 42% since 2009, at a Capex of > NOK 250 mill.</p>

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 Acquisitions and divestments Access to capital Assets Liabilities	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 2015-2019 in various strategic projects to increase top-line growth of sustainable low-emission products and solutions, as described in section C3.1.d. The time horizon for the planning is the short-term strategic period that ends in 2024. Case 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 is NOK 130 mill to be completed mid-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 (2024) 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. 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 Acquisitions and divestment has been influenced Acquisitions of new raw material sources has been a long-term strategy over more than 20 years, to obtain more raw material for production of more low carbon emission products like biopolymers from lignosulphonates. In October 2015 an agreement was signed with Flambeau River Papers for the acquisition of their lignin business based at the latter's Park Falls operations in Wisconsin, USA. The parties have also entered into a long-term lignin raw material supply agreement. The time horizon of the agreement is 2030 (medium-term). How financial planning of access to capital has been influenced Borregaards response to the risk of climate change by setting SBTi and its sustainable business model qualify for an opportunity for green bonds, meaning access to capital with a more favorable margin. Borregaard has entered into three bilateral multicurrency revolving credit facility agreements with DNB Bank ASA, Skandinaviska Enskilda Banken AB (publ) («SEB») and Handelsbanken, Norwegian Branch of Svenska Handelsbanken AB (publ), respectively. The facilities, which are linked to sustainability targets, amount in total to NOK 1,500 million. One of the targets is the Group's 2030 target of Science Based Target. The short-term time horizon of the credit facility is 2020 to 2026. 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. How financial planning of Liability has been influenced Risk of incident of acute pollution due to flooding or heavy rain that can result in environmental liability issues with authorities (physical risk). Borregaard has most of its operation in Norway, where there is an increased risk of acute physical effect due to flooding/ heavy rain/mudslides The production site is from 1889, and chemical production in more than 100 years has resulted in several areas that are polluted for instance with mercury. Borregaard has made a provision in the financial statements to clean up the most exposed areas. The time horizon is short-term from 2015 to 2021.

C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

See our annual report for more background and information about Borregaard.

C4. Targets and performance

C4.1

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

Both absolute and intensity targets

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) (or Scope 3 category)

Scope 1+2 (location-based)

Base year

2009

Covered emissions in base year (metric tons CO2e)

298343

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2030

Targeted reduction from base year (%)

53

Covered emissions in target year (metric tons CO2e) [auto-calculated]

140221.21

Covered emissions in reporting year (metric tons CO2e)

196359

% of target achieved [auto-calculated]

64.4971195937005

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 (including target coverage)

The GHG reduction target is a science-based target approved by the SBTi, and are 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 2020 and 2035. The average annual reduction of scope 1 and 2 emissions is 6.0% from the base year 2009.

Target reference number

Abs 2

Year target was set

2016

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (location-based)

Base year

2009

Covered emissions in base year (metric tons CO2e)

298343

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2050

Targeted reduction from base year (%)

100

Covered emissions in target year (metric tons CO2e) [auto-calculated]

0

Covered emissions in reporting year (metric tons CO2e)

196359

% of target achieved [auto-calculated]

34.1834733846613

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 (including target coverage)

The GHG reduction target is a science-based target approved by the SBTi, and are 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 2035. The average annual reduction of scope 1 and 2 emissions is 3,2 % from the base year 2009.

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) (or Scope 3 category)

Scope 1+2 (location-based)

Intensity metric

Metric tons CO2e per megawatt hour (MWh)

Base year

2009

Intensity figure in base year (metric tons CO2e per unit of activity)

0.172

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

89

Target year

2025

Targeted reduction from base year (%)

41.86

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

0.100008

% change anticipated in absolute Scope 1+2 emissions

39

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

0.108

% of target achieved [auto-calculated]

88.8898765541839

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 (including target coverage)

Target coverage: Borregaard Sarpsborg (Norway) scope1+scope2

C4.2

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

Net-zero target(s)

No other climate-related targets

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?

No, but we are reporting another target that is science-based

Please explain (including target coverage)

The magnitude of emissions we are planning to compensate or neutralize: Our Science-Based target is a 100% removal of fossil GHG emission for scope 1 and scope 2, we do not have to compensate or neutralize any GHG emissions. No activities are plans are identified for compensation and neutralization due to 100% removal of fossil GHG emissions for scope 1 and scope 2.

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*	2	1610
Implementation commenced*	7	9600
Implemented*	1	1250
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)

1250

Scope(s)

Scope 1

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

3500000

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

27500000

Payback period

4-10 years

Estimated lifetime of the initiative

11-15 years

Comment

Energy efficiency project in the company's fine chemicals operations in Norway.

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 (2020-2024), 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 2020 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. Energy cost will decrease by avoiding emissions and making the right decisions in choice of energy source in projects, 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 or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Product

Description of product/Group of products

LIGNIN BIOPOLYMERS Borregaard's lignin-based biopolymers are renewable, wood-based alternatives to fossil-based chemicals and polymers used in a broad range of industries. The environmentally friendly products are used as binders, dispersing agents, crystal growth modifiers, emulsion stabilisers and complexing agents. These multi-functional properties are valuable in a vast range of applications. Documentation of the sustainability of our products and processes is spearheaded by a Life Cycle Analysis (LCA) approach providing Environmental Product Declarations (EPDs). As an example, when used in concrete our lignosulfonates capture more CO2 than what is required for their manufacture. Additional CO2 reductions are achieved from water and cement reduction in the concrete mix design while maintaining the required concrete performance. BIOMATERIALS: SPECIALITY CELLULOSE Speciality Cellulose develops, produces and sells speciality cellulose mainly for use in the production of cellulose acetate, cellulose ethers and other speciality segments. The production and sale of second-generation bioethanol is also part of the Speciality Cellulose business area. At the biorefinery in Sarpsborg, Borregaard invests in technology for speciality cellulose grades with ultra-high purity. This project, named "Ice Bear", makes it possible to broaden our product range into new speciality cellulose niches. EXILVA®. Borregaard has invested 225 million NOK plant in Sarpsborg for the production of Exilva® MFC products for industrial applications. Exilva® MFC enhances structure in product formulations, increasing formulation efficiency and reducing CO2 footprint. Exilva is a new type of bio-based additive, sourced from Norway Spruce in Scandinavian forests.

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (Other = LCA analysis: The study is carried out using life cycle assessment (LCA) methodology based on the ISO-standards 14044/483)

% revenue from low carbon product(s) in the reporting year

90

% of total portfolio value

<Not Applicable>

Asset classes/ product types

<Not Applicable>

Comment

Other = LCA analysis: The study is carried out using life cycle assessment (LCA) methodology based on the ISO-standards 14044/483. Life cycle assessment of a product is defined as systematically mapping and evaluation of environmental and resource impacts throughout the entire life cycle of the product, from "cradle to grave".

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

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

C5.2

(C5.2) 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)

130945

Start date

<Not Applicable>

End date

<Not Applicable>

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

65414

Scope 2, market-based (if applicable)

336965

Start date

<Not Applicable>

End date

<Not Applicable>

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

Metric tonnes CO2e

113998

Emissions calculation methodology

Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). 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. 3.6 (Wernet et al. 2016).

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

1

Please explain

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1756

Emissions calculation methodology

Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). 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. 3.6 (Wernet et al. 2016).

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

0

Please explain

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

Evaluation status

Relevant, calculated

Metric tonnes CO2e

3750

Emissions calculation methodology

Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Activity data (primary data) obtained from Borregaard. Secondary data for fuels obtained as cradle-to-gate emission factors, not included in Scope 1 and 2, from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

11150

Emissions calculation methodology

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 CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Activity data, transport mode and distances (primary data) obtained from Borregaard. Secondary data (emission factors) obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

The reason for the decrease in emissions compared to 2019 is due to collection of more exact and detailed information regarding the transportation of raw materials from our suppliers, as for instance transport distances.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

1971

Emissions calculation methodology

Hybrid method. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Activity data (primary data) obtained from Borregaard. Activity data (primary data) obtained from Borregaard. Secondary data obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

588

Emissions calculation methodology

Only air travel and hotel nights are included. Information on air travel is a mix of information on distances and calculated CO₂/passenger km. Emissions factor for hotel night: 10.1 kg CO₂-eq/night (Brekke et al. 2018). For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied. Activity data (number of business travels and km traveled) obtained from Borregaard. Emissions factors (secondary data) obtained from the publicly available emissions factors from (DEFRA, 2017) and from Brekke et al. (2018).

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

0

Please explain

The reason for the decrease in emissions compared to 2019 is due to the restrictions in travelling caused by COVID-19.

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

807

Emissions calculation methodology

Combination of distances from the home of employees to Borregaard Sarpsborg and national statistics on work travel habits were the basis for calculation of person km (pkm) traveled by different modes of transport: on foot (0 g CO₂-eq/pkm), bike (0 g CO₂-eq/pkm), car (190 g CO₂-eq/pkm), bus (90 g CO₂-eq/pkm), train (1.75 g CO₂-eq/pkm), and air (109 g CO₂-eq/pkm). For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). The number of employees and postal addresses obtained from Borregaard. National statistics on work travel habits assumed to be relevant for Borregaard Norway (Epinom 2019). Emissions factors for commuting by car are based on the average Norwegian passenger in 2018 (SSB, 2018). Emissions factors (secondary data) obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes 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

Metric tonnes CO2e

137777

Emissions calculation methodology

A mix of average transport distances from EPD development and specific transport to customers applied. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Modes of transport for each product, average transport distance, and amount of product obtained from Borregaard. Emissions factors (secondary data) obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

The reason for the increase in the emissions is due to collection of more realistic transport distances to Borregaards customers.

Processing of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

48099

Emissions calculation methodology

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. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Data on the amount of sold products obtained from Borregaard. Emissions factors (secondary data) obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

There are no direct emissions in the use phase of all products except ethanol, alvamax, and bark which are combusted and lead to emissions of biogenic CO₂. The amount of biogenic CO₂ is calculated based on the carbon content of the products multiplied by the molecular weight ratio of carbon to CO₂. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Data on the amounts of sold products are obtained from Borregaard.

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

0

Please explain

End of life treatment of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

7563

Emissions calculation methodology

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 the 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 Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Specific information on carbon content and the amount of sold products obtained from Borregaard. Sodium hypochlorite and hydrochloric acid are treated as hazardous waste at end of life. Data on the amount of sodium hypochlorite and hydrochloric acid are given by Borregaard. Emissions factors (secondary data) are obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes 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

Metric tonnes 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

Relevant, calculated

Metric tonnes CO2e

17153

Emissions calculation methodology

Borregaard had until May 2020 a 50% interest in Umkomaas Ligning Ltd. In South - Africa, and accounts proportionally for emissions from the joint venture. In addition to the input of energy, the input of lignin is also included. For characterization of the GHG emissions and emissions of biogenic CO₂, the Greenhouse Gas Protocol method has been applied (Goedkoop 2010, updated in 2016). Activity data (primary data) and emissions factors from certain activities obtained from Borregaard. Some emissions factors (secondary data) are obtained from the commercially and publicly available database ecoinvent ver. 3.6 (Wernet et al. 2016).

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

0

Please explain

The reason for the decrease in the emissions is due to the ending of the joint venture with Umkomaas in May 2020.

Other (upstream)

Evaluation status

Not relevant, explanation provided

Metric tonnes 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

Metric tonnes 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.

C6.7

(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	139657	Direct emissions

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

0.00003685

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

196359

Metric denominator

unit total revenue

Metric denominator: Unit total

5328000000

Scope 2 figure used

Location-based

% change from previous year

8.4

Direction of change

Decreased

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 in energy mix, the 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 7383tCO2 in 2020 (-3,6 %) . The total revenue increased with 5,2 % from 2019 to 2020, due to lower wood and energy costs, higher production volumes, improved product mix and a positive net currency impact.

Intensity figure

0.107

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

196359

Metric denominator

megawatt hour transmitted (MWh)

Metric denominator: Unit total

1834719

Scope 2 figure used

Location-based

% change from previous year

5.8

Direction of change

Decreased

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 in energy mix, the 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	130846	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	99	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	48
Spain	0
Czechia	0
Germany	2221
United States of America	9206
Norway	119470

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 Ltd.	48	53.431999	2.518186
Lignotech Ibérica SA	0	43.348202	4.046235
BioTech Lignosulfonate	0	49.717969	18.294605
Borregaard Deutschland GmbH	2221	49.04618	8.3127
LignoTech USA, Inc	2164	44.89155	89.623801
LignoTech Florida LLC	7042	30.660132	81.475858
Borregaard Norway	119470	59.277403	11.115526

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	130945	<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)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
United Kingdom of Great Britain and Northern Ireland	18	27	79	0
Spain	104	137	556	156
Czechia	86	103	389	215
Germany	1660	2521	13643	9503
United States of America	14472	14770	84740	0
Norway	49074	319406	873173	0

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	18	27
Lignotech Ibérica	104	137
Borregaard Czech	86	103
Borregaard Deutschland	1660	2521
Borregaard USA	10332	10630
LignoTech Florida	4140	4140
Borregaard Norway	49074	319406

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	65414	336965	
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?

Decreased

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	19400	Decreased	9.5	The total renewable energy consumption increased by 97 GWh in 2020 (1178GWh-1081GWh). The energy mix for peak load steam production at the production site in Sarpsborg, changed in the direction of more electricity from the grid to the electro boilers (scope 2). Increased renewable energy consumption due to increased consumption of electricity and decreased LNG consumption. Emission factor for LNG is 200 tCO2/GWh. Change in emission calculated as decreased LNG consumption: -97GWh*200 tCO2/GWh= -19400 tCO2. Previous year scope1+2 emissions: 203742 tCO2. Emissions value,%: (-19400tCO2/203742tCO2)*100= -9,5% (i.e. a 9,5 % decrease in emissions)
Other emissions reduction activities	500	Decreased	0.2	Implementation commenced 2020, CO2 savings: 1)In 2020, a project "steam converter SO2" was implemented in week 48. Total estimated annual energy savings is 20 GWh. Energy savings 2020 = 20GWh*10weeks/52weeks= 4GWh. Emission factor for LNG is 200 tCO2/GWh. CO2 savings= 4GWh*200tCO2/GWh*0.5 = -400CO2e Implemented 2020, CO2 savings: 2)An energy efficiency project where the main objective was to increase heat recovery by improving heat exchangers and using heat pumps. (Energy savings 2018-2019 11,5 GWh). Energy savings 2020: 1GWh => 1GWh*200 tCO2/GWh(LNG)*0.5 = -100tCO2e Previous year scope1+2 emissions: 203740 tCO2. Change in emissions: -400tCO2-100tCO2=-500tCO2e. Emissions value: (-500tCO2/203740 tCO2) *100= -0,2% (i.e. a 0.2% decrease in emissions)
Divestment	0	No change	0	
Acquisitions	0	No change	0	
Mergers	0	No change	0	
Change in output	0	No change	0	
Change in methodology	4700	Increased	2.3	Scope 1 (Process emissions): Increase due to updated limestone emission factor. Limestone 2020: 9283tCO2(w/2020 factor), 8712tCO2(w/2019 factor). 9300tCO2-8700tCO2= 600 tCO2 Scope 2 (electricity and purchased steam): Increase due to updated emission factors scope 2 (location-based) . Scope 2 2020: 65400tCO2 (w/2020 factors), 61300tCO2 (w/ 2019 factors). (65400tCO2-61300tCO2)=4100tCO2. Previous year scope1+2 emissions: 203742 tCO2. Change in emissions scope1+2 (increase): 600tCO2+4100tCO2=4700 tCO2. Emissions value: (4700tCO2/203742 tCO2)*100=2,3%. (i.e. a 2.3% increase in emissions)
Change in boundary	0	No change	0	
Change in physical operating conditions	0	No change	0	
Unidentified	3617	Increased	1.8	Unidentified change in emissions: 196359tCO2(2020) - [(203742tCO2 (2019)- 19400 tCO2(increased renewable)- 500tCO2(red.activities)+ 4700tCO2(methodology)+ 4200(other))]= 196359tCO2 - 192742tCO2= 3617tCO2 Previous year scope1+2 emissions: 203742 tCO2. Emissions value: 3617tCO2/203742 tCO2*100=1,8% (i.e. a 1.8% increase in emissions)
Other	4200	Increased	2.1	1)The new biopolymer plant in Florida (2018) increased its powder production in 2019 and 2020 which led to higher direct GHG emissions, 800 tCO2 (scope1). 2) Increased energy consumption of 17GWh from spray drying due to increased biopolymer powder production in 2020 (scope 1 Norway+Germany). 17GWh*200tCO2/GWh(LNG)=3400tCO2 Previous year scope1+2 emissions: 203742 tCO2. Change in emissions scope1 (increase): 800tCO2+3400tCO2=4200tCO2. Emissions value: (4200tCO2/198341tCO2)*100= 2,1%. (i.e. a 2.1% 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 5% but less than or equal to 10%

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)	339257	522883	862140
Consumption of purchased or acquired electricity	<Not Applicable>	684917	44487	729404
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	153482	89694	243175
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>	1177656	657064	1834719

C-CH8.2a

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

	Heating value	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	862140
Consumption of purchased or acquired electricity	<Not Applicable>	729404
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	243175
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0
Total energy consumption	<Not Applicable>	1834719

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.

Fuels (excluding feedstocks)

Fuel Oil Number 1

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

13900

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

13577

MWh fuel consumed for self-generation of steam

323

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.0735

Unit

metric tons CO2e per GJ

Emissions factor source

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 factor's for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Comment

Fuels (excluding feedstocks)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

3256

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

3256

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.0735

Unit

metric tons CO2e per GJ

Emissions factor source

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 factor's for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Comment

Fuels (excluding feedstocks)

Liquefied Natural Gas (LNG)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

347487

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

92218

MWh fuel consumed for self-generation of steam

255269

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.0559

Unit

metric tons CO2e per GJ

Emissions factor source

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 factor's for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Comment

Fuels (excluding feedstocks)

General Municipal Waste

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

223670

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

223670

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.0456

Unit

metric tons CO2e per GJ

Emissions factor source

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 factor's for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Comment

Fuels (excluding feedstocks)

Biogas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

47970

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

47970

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>

Emission factor

0

Unit

metric tons CO2e per GJ

Emissions factor source

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 factor's for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Comment

Fuels (excluding feedstocks)

Other, please specify (Liquor from alkaline pulping/bleaching)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

174979

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

174979

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0

Unit

kg CO2e per MWh

Emissions factor source

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 factor's for calculation climate gas emissions from the fuel is given, and these factors are used in the calculations.

Comment

Other = Alvamix. Emissions from biologically sequestered carbon.

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

12020

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

12020

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>

Emission factor

0.05

Unit

metric tons CO2 per GJ

Emissions factor source

"Sector-Specific Issues and Reporting Methodologies Supporting the General Guidelines for the Voluntary Reporting of Greenhouse Gases under Section 1605(b) of the Energy Policy Act of 1992 (1994) DOE/PO-0028, Volume 2 of 3, U.S. Department of Energy"

Comment

Borregaard USA

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

38858

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

38858

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>

Emission factor

0.0503

Unit

metric tons CO2e per GJ

Emissions factor sourceeia - U.S Energy Information Administration. <https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>**Comment**

Lignotech Florida

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	204643	204643	47970	47970
Steam	657497	657497	291287	291287
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.**

	Total gross generation (MWh) inside chemicals sector boundary	Generation that is consumed (MWh) inside chemicals sector boundary
Electricity	0	0
Heat	204643	204643
Steam	657497	657497
Cooling	0	0

C8.2e

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

Sourcing method

Heat/steam/cooling supply agreement

Low-carbon technology type

Biomass

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Spain

MWh consumed accounted for at a zero emission factor

156

Comment

Purchased steam

Sourcing method

Heat/steam/cooling supply agreement

Low-carbon technology type

Biomass

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Czechia

MWh consumed accounted for at a zero emission factor

215

Comment

Purchased steam

Sourcing method

Heat/steam/cooling supply agreement

Low-carbon technology type

Biomass

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Germany

MWh consumed accounted for at a zero emission factor

9503

Comment

Purchased steam

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

603591

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

LHV

Comment

Wood

Fuels used as feedstocks

Liquid biofuel

Total consumption

148019

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)

156542

Capacity (metric tons)

165000

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

0.5

Electricity intensity (MWh per metric ton of product)

1.1

Steam intensity (MWh per metric ton of product)

4.1

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

0.16

Comment

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%	193000000	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 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 2020 amounted to NOK 193million. This represents 3.6% 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: 2018 = 200 mill NOK/200 mill NOK 2019= 200 mill NOK/200 mill NOK 2020 = 193 mill NOK/193 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 2020 Scope 1, Scope 2, and selected Scope 3.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 AS_EUETS_2020_Verifikasjonsrapport_approved.pdf

Page/ section reference

Page 1-8

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 2020 Scope 1, Scope 2, and selected Scope 3.pdf

Page/ section reference

Page 1 and 2

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

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

Reasonable assurance

Attach the statement

SAE_EU ETS_2020_verification report_final.pdf

Page/ section reference

Page 1-8

Relevant standard

European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)

65

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

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 2020 Scope 1, Scope 2, and selected Scope 3.pdf

Page/section reference

Page 1 and 2

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

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 14044-48	Life cycle assessment of cellulose, ethanol and vanillin from Borregaard, Sarpsborg. The 2015 LCA of cellulose, ethanol, lignin and vanillin from Borregaard, Sarpsborg.pdf
C8. Energy	Energy consumption	International Standard on Related Services (ISRS) 4400	C8.2a / C7.5: Verification of purchased electricity Sarpsborg 2020: 698532 MWh. Purchased electricity + Purchased steam Sarpsborg = 698532MWh + 174641 MWh= 873173 MWh. 20 CO2 Kompensasjon ISRS 4400 rapport signert.pdf
C12. Engagement	Product footprint verification	Environmental Product Declaration (EPD) in accordance with ISO 14025	Customers in supply chain: Environmental Product Declaration of cellulose, ethanol and vanillin from Borregaard, Sarpsborg. (Attachment - cellulose) www.epdnorge.no EPD Vanillin 2016.PDF EPD Cellulose 2016.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 (2019) GHG protocol Scope 3 reporting – Borregaard 2020.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 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 2020 Sustainability Reporting EY attestation GRI 2020.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

66

Period start date

January 1 2020

Period end date

December 31 2020

Allowances allocated

184389

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO2e

118200

Verified Scope 2 emissions in metric tons CO2e

42787

Details of ownership

Other, please specify (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 53% reduction in 2030 from a base year in 2009. This has put Borregaard into a favorable 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.

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 2020 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 2019 and 2020 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

- Change internal behavior
- Drive energy efficiency
- Drive low-carbon investment
- Identify and seize low-carbon opportunities

GHG Scope

Scope 1

Application

Borregaard's GHG emissions within EU-ETS is almost 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)

264

Variance of price(s) used

Borregaard Sarpsborg uses 2 different fossil combustibles: Liquid natural gas (LNG) and Waste in the energy production in addition to the renewable sources from electricity and from 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 2020 the average carbon price used was NOK 264/ton CO2, maximum was NOK 353/ton CO2 and minimum was NOK 172/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 of the Energy Director, and the prognosis is changed during the month if necessary. The result is assessed monthly in the Borregaard Energy and Climate committee. The production planner have weekly meetings with production to do smaller adjustments. The Energy Team make their decisions in line with the company energy and climate strategy. 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 2020 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
- 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

11

% total procurement spend (direct and indirect)

11

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

43

Rationale for the coverage of your engagement

All our suppliers of transport and our employees commuting was chosen for the engagement Innovation & collaboration, because Borregaard, as a significant buyer of transport services can contribute to development in climate friendly transport, in line with our Sustainable business model. To reduce the environmental footprint of our bio-based products we need to reduce the environmental impact from the value chain. The transport sector is a major contributor of CO2 emissions and an area where low emission, carbon neutral and emission free solutions rapidly are picking up pace. Transportation of raw materials and finished goods has environmental impact both upstream and downstream in our value chain, representing 3% and 40 % respectively of our total scope 3 emissions. Consequently, transportation is an area where we have potential to make a difference by striving for effective and eco-friendly road, rail and maritime logistics solutions. Climate friendly solutions related to the supply chain are implemented with financial incentives, and work are conducted on the political level and with the authorities to improve infrastructure for transportation and to allow for increased payload. In 2019 we set up an interdisciplinary long-term task force, "Borregaard Emission Free Transport (BEFT) 2020-2050", aiming to implement alternatives for more environmentally friendly transport solutions in the short- and long-term. The task force reports to Borregaard's Sustainability Board. In 2015 we committed to assuming our share of the effort needed for a green shift in heavy goods transport by signing the environmental organization ZERO's declaration: "A green shift for renewable heavy-goods transport". Contracts with Norwegian road transport service providers require eco-friendly transport that uses engines that, as a minimum, satisfy the Euro 5 emission standard. We are engaging with the authorities to allow for increased payload aiming at reducing transport emissions. We encourage our wood suppliers to deliver wood on short distance to reduce emissions by applying financial incentives based on distance of transportation. In 2019 we qualified for the regional program "Home-Work-Home", an initiative run by the local county aiming to reduce the use of cars between home and work.

Impact of engagement, including measures of success

Borregaard aims for effective and eco-friendly solutions for transportation of raw materials, products to customers and employee travel. The work in the task force "BEFT 2020-2050" has led to several initiatives and a better overview of which areas that should be prioritized. In 2020 the task force implemented a tool for calculation of emissions from different transport solutions. This led to increased data quality and transparency. The tool verifies that 82% of the transport in ton-km to our customers is by sea. The overview from the tool assists us to choose the best transport alternatives and to select the suppliers with the best performance and enables us to co-operate with the value chain to reduce emissions. By signing the ZERO declaration, Borregaard has committed to increase the share of transport of goods by rail and sea. Rail is important for the transport of wood in Norway and in 2020 we reached the goal of 23% of the purchased wood by rail. This is equivalent to reduction of more than 1,700 tonnes of CO2. When heavy-duty vehicle is used Borregaard require Euro 5 or Euro 6 engines from the suppliers. In 2020 85% of road transport was by Euro 6 engines as a minimum. Use of Euro 6 engines leads to a significant reduction in NOx emissions compared to Euro 5. Borregaard has increased its fleet of electric vehicles for local transport and has installed several charging stations at the site in Norway to reduce CO2 emissions associated with employee travel. The share of electric cars among the employees has increased the latest years. By launching the employee program "Home-Work-Home", more than 70 of Borregaard's employees acquired e-bikes on payroll deduction, and almost 100 bought subsidized tickets for public transport. Representing less than 1% of the scope 3 emissions, this initiative is more important for building awareness rather than reducing emissions. As of 2020, Borregaard's transport services are tendered with requirements for reducing carbon footprint in short, medium, and long term. Suppliers must comply with these requirements, which are weighted in the decision process. The measure of success is the reduction target in our scope 3 emission, the SBTi is 30% reduction in 2030 from a 2017 base year. The task force, "BEFT 2020-2050" follows up progress towards the target to make sure that Borregaard has the right actions in place.

Comment

C12.1b

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

Type of engagement

Education/information sharing

Details of engagement

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

Portfolio coverage (total or outstanding)

<Not Applicable>

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

One of Borregaard's main challenges is successful development and sales of sustainable and climate-friendly products that can replace oil-based products. Successful development, marketing and sales of bio-based products will have a positive impact on several SDGs, such as food and feed production (SDG 2), construction and infrastructure (SDG 9, 11), clean energy (SDG 7), transportation solutions (SDG 9), chemicals for water purification (SDG 6) and in addition enables our customers in many cases to reduce their GHG emissions (SDG 13 climate). An important stage of a successful marketing is to have the relevant sustainability information easily accessible for our customers. We have recently 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. To be able to document the effect of our products to our customers we have made relevant documentation like Sustainability certificates and Environmental Product Declarations (EPDs) available on the web pages. Based on our EPDs we 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. For this engagement we have selected the customers in our BioSolution division, which have 80% of our customers and has a wide product portfolio and is selling to customers globally, which mean that this customer group can have a high impact for transition to more low emission products. The web pages are an important part of our marketing and communication effort to maintain a strong position in the market and integrating the sustainability message even more in our communication with customers, and then capitalize on our sustainability effort.

Impact of engagement, including measures of success

The division BioSolutions has established a Sustainability task force that is concentrated on increasing customer and market awareness of Borregaard's bio-based and sustainable biopolymer products, by improving our information about our products like how to calculate CO₂ emission reductions from EPD's and other types of sustainability certification. Such market activities to realize customers' availability to capture the sustainability benefits of a bio-based product and the expansion of our customer base in new applications and geographical markets is important to place more low emission product into the market. Reports from our customer relation system is used to measure how many customers that have seen the information and how many new leads we get, we measure sustainability discussion in our database HubSpot, and sustainability downloads from our web pages. This will give us an idea of the demand from our customers when it comes to sustainability and how we can improve the awareness from our customers to Borregaard's low emission bio-based and sustainable biopolymers. We have short-term measures of success like KPI for sustainability leads on our web page, but the long-term measure of success is increased sales, new markets or increased premium price due to the sustainability advantage of the products. Measure of success is evaluated together with all the activities that is necessary to put new products on market, such as described for the Florida case described in C2.4b, opportunity 2. In addition to market activities to realize customers' ability to capture the sustainability benefits of a bio-based product, expansion of customer base in new applications and geographical markets and innovation/R&D activities are conducted. The Florida plant launched 11 new products in 2020, and the number of customers increased from approx. 100 in 2019 to >200 in 2020. The number of segments sold increased from 25 in 2019 to 30 in 2020. The EBITDA target for this project in the short-term period is between 50 MNOK to 100 MNOK.

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 was established 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 Resource Organisation or ZERO

Zero is a Norwegian environmental organisation that work with reduction of greenhouse gases, 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 new transportation fuels, including hydrogen and biofuel. 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 to make an agreement to cooperate and to share competence and common interests.

Example Partnership for investment in forest related sector

Shelterwood AS

In 2018 Borregaard established Shelterwood AS, together with other industry and financial partners. The Company 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 the first investments in a company with bio-based products and the long term target of the financial result from the investment.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
- Trade associations
- Funding research organizations
- Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Mandatory carbon reporting	Support	Meetings with Norwegian Environment Agency in Norway	Emission factor CO2 from waste incineration is decided by Norwegian Environment Agency. The factor set by the Swedish authorities is about 40 % lower, even if it is the same waste market. The proposed legislative solution is to harmonize the factors for the Nordic countries. We support this with no exceptions
Clean energy generation	Support	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.	Norway must contribute to high availability of renewable energy at competitive cost. Energy policy must contribute 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.
Cap and trade	Neutral	Borregaard Sarpsborg is member of The Federation of Norwegian Industries (NI) and The European association representing the paper industry (Cepi). Both organizations work for framing conditions for the industry. Comments to the draft guidelines for indirect CO2 compensation has been given from Borregaard together with the organizations which have supported our view, and communicated to the Commission.	Indirect CO2 compensation – Following the European Commission's official adoption of the ETS state aid guidelines (which defines the rules for compensating indirect carbon costs passed into electricity prices) Borregaard has - together with The Federation of Norwegian Industries (NI) and through the Norwegian authorities - argued for the full eligibility of biorefineries towards ESA. Together with a market-based pass-through factor for Norway, this will be key to mitigate the risk of carbon leakage going forward.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

CEPI-confederation of European Paper Industry

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

CEPI is supporting a reasonable climate change policy and was the first industrial association presenting a 2050 roadmap of its own which was appreciated by the EU climate commissioner. CEPI strives for climate change mitigation measures that ensure a level playing field for the industry and takes carbon, as well as investment leakage into consideration. Carbon leakage protection needs to be the first element of the ETS revision based on the same criteria and assumptions as under Phase III, as well as on technically and economically achievable benchmarks; - An EU-wide harmonised system must be put in place, which fully off-sets direct and indirect costs at the level of the most efficient installations in all Member States; therefore, no cross-sectorial correction factor should be applied to free allocation; - Allocation methodology must be closely aligned with real/recent production levels; - Innovation support must be extended to industrial sectors - An EU-wide harmonised system must be put in place, which fully off-sets direct and indirect costs at the level of the most efficient installations in all Member States; therefore, no cross-sectorial correction factor should be applied to free allocation; - Allocation methodology must be closely aligned with real/recent production levels; - Innovation support must be extended to industrial sectors.

How have you influenced, or are you attempting to influence their position?

Borregaard support the work of CEPI. Borregaard's experts are active in the Climate and the Environmental committee and participate in creating trade association stand points. Supporting data for the position and anchor the position with national authorities and politicians.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

Yes

C12.3e

Framing condition for sustainable industry

Borregaard has engagement activities in organisations and associations working for framing condition for sustainable industry and transforming into a low-emission society and that can influence policy on climate change. Borregaard has dedicated persons in our organization that holds positions in expert groups.

THE FEDERATION OF NORWEGIAN INDUSTRIES (NI)

Borregaard Sarpborg is member of The Federation of Norwegian Industries (NI). NI works for framing conditions for businesses in sectors and industries. 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. Focus is now on new regulations as a result of EU Green Deal.

PROCESS 21, Roadmap to zero emissions

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. Process21 shall give strategic advice and recommendations to the government and other actors on how to combine sustainable growth and reduced emissions from the process industry.

Borregaard held positions in the steering committee that has representatives from the industry, academia and representatives from the tripartite constituents. Process21 is a national forum set up by the Norwegian Ministry of Trade, Industry and Fisheries. The strategy process will end up with advice and recommendations to the Government and other stakeholders on how the process industry can take a leading role in the transition into a low emission society. Part of the recommendations will be to advise how the government's funding agencies better can support the transition. The final report was handed over to the ministry in January 2021. The Paris climate agreement of 2015, our participation in the EU Emission Trading System (ETS) and the Norwegian Parliament's decision that Norway shall be a low carbon society in 2050 are all important frameworks for the process industries development in the coming years. The process industry is an integral part of this future and have a clear vision: Increased value creation from the industry with zero emissions in 2050.

Process21 has two goals. The first is to reduce the emissions from the industry. The second is to make sure that the industry continues to contribute to value creation in Norway, within the framework of the Paris climate agreement. The forum is set to consider how the process industry in Norway and our technological development in Norway can have indirect effect on cuts in emissions in other sectors and businesses, both in Norway and globally. The work is organized in expert groups to assess key topics related to reduced emissions and increased value creation.

Borregaard method of engagement is that we have a chairman position in the expert groups for bio-based process industry and have our internal experts as members in the CCS (carbon capture and storage) group and digitization group. This means that Borregaard have an active role in developing the Norwegian process industry into the low-emission society.

"WE MEAN BUSINESS"

Borregaard became member of the "We mean Business" coalition and signed a pledge to combat global warming by committing to a science-based emission reduction target. The "We Mean Business" coalition is made up of non-profit organisations, businesses, and investors that recognize transitioning to a low carbon economy is the only way to secure economic growth. Membership in such organisations are sending a signal to the authorities and will influence policy on climate change.

Co-operation Agreement with ZERO

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. 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.

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Borregaards climate change strategy is to provide sustainable solutions and 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. There is a process implemented to make sure that direct and indirect activities are consistent with Borregaards overall climate change strategy. Borregaard strategy is to develop sustainable products and solutions

Process have 4 elements:

1. Sustainability Board is established to coordinate all the sustainability activities within the company including direct and indirect activities that influence policy and report progress to the Board of Directors. This ensures that the communications with customers, authorities and other stakeholders are consistent. The Sustainability Board is also responsible for writing the yearly Sustainability report, internally the report is used to communicate the latest progress within climate and sustainability related activities.
2. Senior Vice President Purchasing and Strategic Sourcing has the responsibility for the regulations within energy/CO2 and to develop Borregaard's climate strategy based on input from the processes below. She is a member of the Sustainability Board at Borregaard and holds the position as a board member of both CEPI and The federation of Norwegian Industries.
3. Borregaard Climate and Energy Committee has been established to develop energy and climate strategy, from changes in regulations, changes in energy contracts and prioritisation of energy investments. The members of the committee are employees from different positions that either use energy, produce energy, control energy consumption, manage energy and climate projects, report energy and climate data and changes in climate related regulations. The head of the committee (Energy Director) is also a member of the Climate and Energy committee in The Federation of Norwegian Industries. The Energy Director is reporting to Senior Vice President Purchasing and Strategic Sourcing. Especially the strategy and plans to achieve the science-based targets for emission in 2030 and 2050
4. EHS and Sustainability Manager has the responsibility for the process to collect climate and energy data at company level. The energy and climate data are collected from all the company units/production sites. The quality of the data is checked before they are reported in a sustainability report. 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. EHS and Sustainability Manager is a member of the Energy and Climate committee at Borregaard and Sustainability Board at Borregaard and chairs the Environmental committee of The Federation of Norwegian Industries and is a member of the CEPI Environmental Committee.

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 2020.pdf

Page/Section reference

Page 6-11 Page 30-75 (Sustainability and corporate responsibility)

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Annual report 2020

Publication

In voluntary communications

Status

Complete

Attach the document

Borregaard has committed to major greenhouse gas reductions - Borregaard.pdf

Page/Section reference

1

Content elements

Emission targets

Comment

<https://www.borregaard.com/company/news-archive/borregaard-has-committed-to-major-greenhouse-gas-reductions/>

C15. 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.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	President and Chief Executive Officer, CEO, of Borregaard	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 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.

Firmenich might be a customer of our customers, they are not a direct customer of Borregaard today.

SC0.1

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

	Annual Revenue
Row 1	5328000000

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

Yes

SC0.2a

(SC0.2a) Please use the table below to share your ISIN.

	ISIN country code (2 letters)	ISIN numeric identifier and single check digit (10 numbers overall)
Row 1	NO	0010657505

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.

SC1.2

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

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 a large number of different products.

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 LCA analysis and calculate for some customeres.

SC2.1

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

SC2.2

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

SC4.1

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

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission	Are you ready to submit the additional Supply Chain questions?
I am submitting my response	Investors Customers	Public	Yes, I will submit the Supply Chain questions now

Please confirm below

I have read and accept the applicable Terms