W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

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

A BIOREFINERY WITH HIGH VALUE-ADDED

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

SPECIALISATION IN GLOBAL NICHES

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

COMPETENCE AS THE MAIN COMPETITIVE ADVANTAGE

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

SUSTAINABLE BUSINESS MODEL

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

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

Borregaard will take climate action and demonstrate how our business can help to advance sustainable development by both minimising negative environmental impacts and maximising positive environmental impacts.

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment report released in August 2021 provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades, and finds that unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, limiting warming

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

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

W-CH0.1a

(W-CH0.1a) Which activities in the chemical sector does your organization engage in?

Bulk inorganic chemicals
Specialty organic chemicals

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1 2021	December 31 2021

W0.3

(W0.3) Select the countries/areas in which you operate.

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

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

NOK

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which operational control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W0.7

(W0.7) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

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

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Vital	Water is one of the main elements in a biorefinery manufacturing process. At Borregaard Norway (95% of total withdrawal), freshwater is used for cooling, steam production and hot water production, as well as washing and transporting biomass/fiber in the biorefinery/pulp production processes. Therefore, direct use importance rating is "vital". The site is self-sufficient and has access to freshwater from the river Glomma via its own water treatment facility. Since water is vital to Borregaard we have built our own water treatment facility. The facility was completed in 2004 and has the capacity to supply Borregaard with the necessary amount of water needed for the production process. Good quality of the water after treatment is vital due to that Borregaard has several products that require high quality water (food, pharma etc.) The production site in Czechia, Germany, Spain and two in USA uses less than 5% of the total withdrawal of water. The production process is mainly drying of liquid biopolymers in spray driers. The future water dependency is expected to be unchanged for the direct operations, because we plan to have the same type of production in the future. The indirect water use of good quality freshwater is rated vital, the reason for that is that Borregaard's production units outside Norway receive lignin raw material from adjacent pulp mills, and from the experience form our pulp mill/biorefinery in Norway we know that sufficient fresh water is vital for a pulp mill, see explanation above. The future water dependency for indirect operations is expected to remain vital as we anticipate that we will continue to source lignin raw material from pulp mills at the same extent as we do today.
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Important	In Borregaard for all 7 production sites there is only a minor primary use of brackish and/or produced water in direct and indirect operations. The main production site, Borregaard Norway is a biorefinery. One part of the biorefinery is a speciality cellulose pulp line, closed water circuits are used in the process of washing the pulp, which means that wash water is recycled to some extent. Thus we have selected the importance rating "important" for direct operations due to the use of recycled water in the closed water circuits in the pulp production line. The indirect water (used by our suppliers), use of recycled, brackish and/or produced water as "important". The reason for this is that Borregaard's production units outside Norway receive lignin raw material from adjacent pulp mills, and from the experience from our pulp mill/biorefinery in Norway we know that recycling of closed water circuits is used in the process of washing the pulp, which means that wash water is recycled to some extent. Recycling of water is important for energy efficiency, resource optimisation and cost in a pulp mill. Future water dependency will most likely not differ in the direct and indirect operations as long as there are no changes in geographic production sites and type of products produced.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	Data are reported from all of Borregaard's 6 operational sites. Borregaard's water withdrawal volumes used in processes and for cooling purposes are measured in m3. Total water withdrawal is 57610 megaliters. The reason for measuring the total volumes is to be able to control the usage. The main water withdrawal volume is from the river Glomma at Borregaard's site in Norway (95% of total water withdrawals), where water withdrawal volumes are measured continuously with on-line measurement devices. The method of measurement is magnetic flow meter. It is also continuous volume flow measurement devices in the different production units, and a water accounting system is used to monitor the water usage for each production unit that the site consists of. The production sites in Czechia, Germany, UK and the two in USA uses less than 5% of the total withdrawal of water, and they report a yearly number of water withdrawal based on volume measurements and some estimates.
Water withdrawals – volumes by source	100%	Data are reported from all of Borregaard's 6 operational sites. Surface water 54196 megaliters, groundwater renewable 149 megaliters, produced water 610 megaliters and water from third parties 2656 megaliters. The reason for measure the volumes by source is to be able to report within Borregaard, and to report externally as several of our stakeholders expect. The main water withdrawal source is surface water from the river Glomma in Norway (95% of total water withdrawals), where water withdrawal volumes are measured continuously with on-line measurement devices. The method of measurement is magnetic flow meter. The production site in Czechia, Germany, UK and the two USA uses less than 5% of the total withdrawal of water, and they report at yearly number of water withdrawal based on volume measurements and some estimates. The water produced is calculated from raw material volumes times dry matter measurements in the raw materials, yearly calculation.
Entrained water associated with your metals & mining sector activities - total volumes [only metals and mining sector]	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	<Not Applicable>	<Not Applicable>
Water withdrawals quality	76-99	Data are reported from Borregaard operational site in Norway. Borregaard's site in Norway is 79% of Borregaard's total revenue/ operations (1 of 6 sites, and has 95% of the total water withdrawal). Water withdrawals consists of river water 98%, municipal water 1% and produced water from raw materials 1%. The quality of the water withdrawals from the river is monitored continuously at the water treatment facility, with daily water sampling and analysis of pH and turbidity. Water withdrawal from the river Glomma used for drinking quality follows the regulatory demands from the Norwegian Food Safety Authority. The reason for why Borregaard measures the quality is that it is a requirement for several of the products that are delivered to the food and pharma market.
Water discharges – total volumes	100%	Data are reported from all of Borregaard's 6 operational sites. Water discharge volumes is used to calculate the amount of substances in the water discharge, which is a requirement from environmental authorities. Process wastewater 20042 megaliters, cooling water 37005 megaliters and 126 megaliters of sanitary wastewater. The main water discharge is from Borregaard Norway (95% of total water discharges) where discharge volumes are measured continuously with on-line measurement devices. The method of measurement is magnetic flow meter. The production site in Czechia, Germany, UK and the two USA discharges less than 5% of the total discharges of water, and they report yearly numbers of water discharges based on volume measurements and some estimates. To balance water accounting (total volumes), "water discharges not measured" is calculated: Water withdrawals - Water discharges measured - Water consumptions = 57610-56871-311=428 megaliters in 2021 (1% of total water discharges)
Water discharges – volumes by destination	100%	Data are reported from all of Borregaard's 6 operational sites. Water discharges to surface water 55648 megaliters and to third party destinations 1651 megaliters. Data are reported from all of Borregaard's operational sites. In the method used for measurement, the volumes are essential as they are used to calculate the amount of substances in the water discharge per destination, which is a requirement from environmental authorities but also something some of our stakeholders expect us to do. The main water discharge is from Borregaard's site in Norway to river Glomma (95% of total water discharges) . The frequency of measurements at the production site in Norway is continuous, by volume flow measurements of water discharges to the river Glomma. The production sites in Czechia, Germany, UK and the two sites in USA discharges less than 6% of the total discharges of water, and they report yearly numbers of water discharges based on volume measurements and some estimates.
Water discharges – volumes by treatment method	100%	Data are reported from all of Borregaard's operational sites. Secondary treatment 5%, other internal treatment 5%, discharge to natural environment without treatment 87% and treatment at third parties 3%. At Borregaard's site in Norway 100% of process wastewater, incl. volumes treated by the wastewater treatment plant, are measured continuous. Automatic samplers in the effluent discharge pipes, take samples that are representative for the water discharge. Every 24 hours a sample is taken out from the sampler by a third party and brought to the laboratory at Borregaard for measuring of standard effluent parameters. The volumes of the discharge water is reported directly for the DCS-system to the digital emission accounting system. The production sites in Czechia, Germany, UK and the two sites in USA discharges less than 6% of the total discharges of water, and they report yearly numbers of water discharges based on some volume measurements and some estimates.
Water discharge quality – by standard effluent parameters	100%	Data are reported from all of Borregaard's operational sites. Water discharges is measured by standard effluent parameters, to meet the requirements of environmental permits of local authorities. COD, which is an indirect measure for the organic content in the effluent, is the main parameter in the emission monitoring program. The concentration of the effluent parameter is entered into the emission accounting, where the volume of discharged water times concentration gives the water discharge quality. Borregaard's site in Norway has 95% of the total water discharges. Several effluent parameters are measured daily/weekly from process wastewater: COD, BOD, AOX, S-TS, N, P and metals. Total COD emissions in process water discharged was 55 t/day in 2021. The permit for COD in the effluent is reduced from 69 tonnes to 59 tonnes per 24-hour period (on average over the year) to comply with BAT levels for emissions to water. Requirement in the emission permit from the authorities.
Water discharge quality – temperature	76-99	Data are reported from Borregaard's operational site in Norway. Borregaard's production site in Norway accounts for 79% of Borregaard's total revenue/operations (1 of 6 facilities, and has 95 % of the total water discharges). Temperature is measured continuous for some of the effluents at the production site in Norway. In the internal water circuits in the production process, as much heat is taken out as possible and used for the production of hot water energy. The 37oC wastewater from the wastewater treatment plant is cooled down to river temperature before it enters the recipient river Glomma, the energy is used for district heating in Sarpsborg, Norway. Temperature measurement is continuous and based on sensors measuring resistance. It is not known if temperature is monitored at the other production sites.
Water consumption – total volume	100%	Data are reported from all of Borregaard's operational sites. Water consumption volumes are calculated from production volumes times dry matter measurements in the products. The calculation is done on a yearly basis (=volume incorporated into products). Water consumption is reported in our environmental product datasheet (EPD's).
Water recycled/reused	76-99	Data are reported from Borregaard's operational site in Norway. The production site in Norway accounts for 79% of Borregaard's total revenue/operations (1 of 6 sites and has 95 % of the total water withdrawals). Borregaard's site in Norway recycles water in its production for saving heating energy and for reducing the amount of water used. There are several ways Borregaard is reusing water: 1) Closed water circuits are used in the process of washing the pulp, which means that wash water is recycled to some extent, limited by right product quality. 2) Condensates from evaporation units is used for washing. 3) Steam condensate is routed back to the boiler house to produce new steam. Water flow are measured continuously with on-line measurement devices with of measurement is magnetic flow meter. In addition, for the condensates the temperature is measured to calculate the energy content, and report the reuse as % of reused condensate in GJ pr feed water for steam production.
The provision of fully-functioning, safely managed WASH services to all workers	100%	100 % of Borregaard's workers have access to clean water supply, adequate sanitation and hygiene at all times. Facilities are located in areas where sanitation and WASH services are well managed. The water use is measured and monitored, at least annually, through water use invoicing and is expected to stay on same level in future.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	57610	About the same	The volumetric data is obtained from measurements of water intake and summarized for all the 6 production sites. For cooling water there is done some estimates in the data. The total withdrawals are at the same level as previous years due to the same production volumes and the same amounts of water necessary for cooling processes. The water withdrawal is expected to be the same or lower in the next 3-5 years. The production volume is expected to remain more or less the same, but there are some initiatives planned to increase the amount of recycled water in the bleaching plant at Borregaard in Norway that might have an effect om the total water withdrawal. Comparison of total withdrawals with previous reporting year - threshold: About the same <5%, lower/higher 5-20%, much lower/higher >20%
Total discharges	57299	About the same	All of Borregaard's operational sites are reporting their water discharge volumes. The volumetric data is obtained from continuous measurements of water discharges. For cooling water there are done some estimates in the data. The total discharges are at the same level as previous year due to the same production volumes. The water discharges is expected to be the same or lower in the next 3-5 years. The production volume is expected to remain more or less the same, but there are some initiatives planned to increase the amount of recycled water in the bleaching plant at Borregaard in Norway, that might have an effect om the total water discharge. Comparison of total discharges with previous reporting year - threshold: About the same <5%, lower/higher 5-20%, much lower/higher >20%
Total consumption	311	About the same	Data are reported from all of Borregaard's operational sites. Water consumption volumes are calculated from production volumes times dry matter measurements in the products. (=Volume incorporated into products) The total consumption is at the same level as previous year due to same production volumes. The water consumption is expected to be the same or lower in the next 3-5 years. The production volume is expected to remain more or less the same, we might produce more dry lignin products for Borregaard in Norway, that might will give some reduction in consumption compared to if the product was delivered as 50 % moisture content. Comparison of total consumption with previous reporting year - threshold: About the same <20%, lower/higher 20-50%, much lower/higher >50%

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress and provide the proportion.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Identification tool	Please explain
Row 1	No	<Not Applicable>	<Not Applicable>	WWF Water Risk Filter	Water scarcity risks have been evaluated for Borregaard's operations using The WWF Water risk filter. The overall risk of physical, regulatory, and reputational risks is aligned with the UN Global Compact CEO Water Mandate framework. Physical risk includes scarcity, flooding, water quality and ecosystem status. Regulatory risk includes enabling environment, institutions and governance, management instruments, and infrastructure and finance. Whilst reputational risk includes cultural importance, biodiversity importance, media scrutiny and conflict. Most of the water withdrawal, discharge and consumption are linked to our biorefinery in Norway (95%). The river Glomma is the largest river in Norway and has an average water flow of 577 m3/sec. The Sarpsfossen waterfall, which is close to the biorefinery, is Europe's largest waterfall (amount of water), and the overall water scarcity risk is low. Climate scenarios for the area around Borregaard's biorefinery show a wetter climate with more precipitation. Thus, the average water flow in the river Glomma is likely to increase. The biorefinery has access to water from the river Glomma via its own water treatment facility. Due to the large amounts of water available, water withdrawal is considered sustainable compared to areas in the world where water scarcity represents a risk due to climate change. The WWF Water Risk Filter was applied to evaluate whether the water has been removed from stressed area. Our production units in USA (Florida and Wisconsin), Germany, The Czech Republic and UK use less than 6% of the total withdrawal of water at Borregaard. The water is sourced from public waterworks or adjacent industrial areas. Borregaard's lignin plant in Florida withdraws water from a ground water source, the Floridan aquifer system, which is one of the world's most productive aquifers. The WWF Water Risk Filter was applied to evaluate whether the water has been removed from stressed area. The tool evaluates the risk level of the area where our Florida plants is located to be moderate.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	54196	About the same	Borregaard's main water withdrawal source is fresh water from river Glomma. Therefore this aspect is relevant for Borregaard. The production site in Norway has almost all its water withdrawal from the river Glomma. 94 % of Borregaard's water withdrawal is from fresh surface water (measured volumes). The water withdrawal was about the same in 2020 as in 2021 due to the same volume of products produced. The water withdrawal is expected to be the same or lower in the next 3-5 years. The production volumes will stay the same, but there is some plans to reduce the water withdrawal in some process units. The production sites in Czechia, Germany, UK and the two USA have less than 6 % of the water withdrawal and has water withdrawal from third party or ground water. Comparison with previous reporting year - threshold: About the same <5%, lower/higher 5-20%, much lower/higher >20%
Brackish surface water/Seawater	Not relevant	<Not Applicable>	<Not Applicable>	None of our production sites in Norway, Czechia, Germany, UK and the two in USA use brackish/seawater in their production.
Groundwater – renewable	Relevant	149	About the same	Borregaard's lignin plant in Florida has water withdrawal from a ground water source, the Floridan Aquifer System, which is one of the world's most productive aquifers (measured volumes). 0,3 % of Borregaard's water withdrawal is from groundwater. The amount of water used in 2021 was about the same as in 2020 due to production process is being about the same. The volume of groundwater withdrawal in future is expected to be the same as the production volume is expected to be the same. Comparison with previous reporting year - threshold: About the same <20%, lower/higher 20-50%, much lower/higher >50%
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	None of our production sites in Norway, Czechia, Germany, UK and the two in USA use non-renewable in their production.
Produced/Entrained water	Relevant	610	About the same	Borregaards operations in Norway uses wood as raw material. Borregaards operations in Czechia, Germany and the two USA use biopolymers in liquid solutions as main raw materials. The raw material contains water. The moisture content in the raw material is measured at a regular frequency. The produced water is calculated as weight of raw materials multiplied by moisture content. 1 % of Borregaard's water withdrawal is from produced/entrained water. The amount of produced water volume was about the same in 2021 as in 2020, since the amount of raw materials used in 2020 and 2021 was about the same, and it is expected to be the same amount of raw material usages in the next 3-5 years. Comparison with previous reporting year - treshold: About the same <20%, lower/higher 20-50%, much lower/higher >50%
Third party sources	Relevant	2655	About the same	Borregaard's production site in Norway receives some water from community water works. This could also be considered as a backup solution if for instance an incident as stop in power supply occurs. The production site in Czechia, Germany, UK, and the two in USA also uses third party water. 5 % of Borregaard's water withdrawal is from third party sources. The amount of water used from third party was about the same in 2021 compared to 2020 (measured volumes), mainly because there where no changes in the production volume between the two years. The price of the water from the community water works at Borregaard Norway is 10 times higher than own produced water. New measurements has recently been installed, and we are expected to reduce this the next 3-5 years, as own produced water are much cheaper. Comparison with previous reporting year, threshold: About the same <20%, lower/higher 20-50%, much lower/higher >50%

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	55648	About the same	Process wastewater and cooling water is discharged to the river Glomma in Norway and some cooling water to the fresh water nearby operations in Florida and in Wisconsin. For Borregaard Norway the total volume of water is measured and in addition the concentration of substances in wastewater to be able to calculate the effluent to water in kg. 97 % of Borregaard's water discharge is discharged to fresh surface water. The water discharge was about the same in 2020 as in 2021 due to same production process, but is expected lower in the next 3-5 years. The production volume is expected to remain more or less the same, but our strategy and plans is to increase the amount of recycled water in the bleaching plant at Borregaard Norway, that might have an effect om the total water discharge. Comparison with previous reporting year - threshold: About the same <5%, lower/higher 5-20%, much lower/higher >20%
Brackish surface water/seawater	Not relevant	<Not Applicable>	<Not Applicable>	Water discharges to this particular destination is not relevant, because Borregaard is not supplying water discharges to brackish surface water/seawater.
Groundwater	Not relevant	<Not Applicable>	<Not Applicable>	Water discharges to this particular destination is not relevant, because Borregaard is not supplying water discharges to groundwater.
Third-party destinations	Relevant	1651	About the same	Borregaard is supplying about 3% of the wastewater to third party destinations: third-party process wastewater treatment plants and city sewers. The amount of water is measured by the third-party and Borregaard receives bill's for the treatment. The volume is about the same as previous year due to the same production process and is expected to be the same in the next 3-5 years as the production process will remain more or less the same. Comparison with previous reporting year - threshold: About the same <20%, lower/higher 20-50%, much lower/higher >50%

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	By the nature of the discharges from Borregaards operation, tertiary treatment are not installed. The main component in the waste water effluent from Borregaard's processes is organic material (measured as COD). The organic material stems mainly from the washing and processing of biomass into advanced products. COD can be efficient treated in biological waste water treatment plant. For Borregaard's operations in Czechia, Germany and the two in USA the COD containing part of the wastewater is treated in third-party biological secondary treatment plant. Borregaards operation in Norway has an anaerobic treatment plant that reduce the COD by more than 75%. Borregaard in Norway work with plans for further reduction of COD, but tertiary treatment is not relevant. We are planning to install a liquid waste water incinerator for combustion of the remaining process waste water, this will be gradually installed from 2026. Tertiary treatment is not defined as a Best Available Technique (BAT) from our industry (Biorefinery/Pulp).
Secondary treatment	Relevant	2937	About the same	1-10	Borregaard in Norway has a wastewater treatment plant based on the anaerobic treatment technology using the Biobed EGSB (Expanded Granular Sludge Bed) process. The compact anaerobic process ensures an efficient reduction of organic matters in the waste water. The process produces biogas which has replaced use of mineral oil in our. The rationale for using this technology is that it has an effective reduction of low molecular organic material, measured as biological oxygen demand (BOD). The wastewater treatment facility reduces BOD by 98%. The waste water is monitored for COD, BOD, Phospor, Nitrogen and Copper, and has permits for the emissions. The emission of these compounds are reported to the Norwegian Environment Authorities. The future trend for the next 1 to two years will probably increase to high, as the treatment plant has more capacity than we utilise today, we are doing trial with new effluent streams to see if they can be treated in the anaerobic treatment plant. Comparison with previous reporting year - threshold: About the same <5%, lower/higher 5-20%, much lower/higher >20%. The threshold is also used for future trend.
Primary treatment only	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	The compounds in the emission to water are dissolved in the process water, and not present as particles. The rationale for using primary treatment to remove particles or sludge is not present, thus this technique is not used in our operations.
Discharge to the natural environment without treatment	Relevant	49811	About the same	81-90	Cooling water which is 37005 megaliters or 74% of the discharge to the natural environment without treatment. The rationale for not treating the water is that it is cooling water. The temperature of the cooling water is measured in most effluent streams and it does not affect the temperature in the receiving recipient. The river Glomma is the main receiver of cooling water from our operations and no effect of increased water temperature is registered. Volume is measured for cooling water and reported in our water accounting system. 26% of the water is process wastewater (12806 megaliters). The main part of this water is discharged from our operation at Borregaard in Norway. The main rationale for not treating this water has been that we have not find any water treatment technologies that can be used. Borregaard in Norway cannot use aerobic treatment as a decision from the authorities due to a legionella outbreak in 2005&2008. The waste water is monitored for COD, BOD, AOX, Phosphor, Nitrogen, Copper and some other compounds, and has permits for the emissions. The emission of these compounds are reported to the Norwegian Environment Authorities. We have planes to reduce the process waste water, both volume of water and the load. In 2023 we are planning to route more waste water to the anaerobic treatment plant. In addition, a liquid waste water incinerator will be gradually installed from 2026. Thus we anticipate that the future trend, 2 to 5 years ahead is that the volume will decrease to lower. Reduction in cooling water volume is motivated by the potential gains associated with energy savings and but the volumes is high, thus the for the threshold selected the cooling water will be about the same for the next 2 to 5 years. Comparison with previous reporting year - threshold: About the same <5%, lower/higher 5-20%, much lower/higher >20%. The threshold is also used for future trend.
Discharge to a third party without treatment	Relevant	1651	About the same	1-10	Used sanitary water is treated are sent to city sanitary sewers for treatment. The method has the rationale to treat the water according to the requirement of the local authorities. The sanitary treatment plant operated by Sarpsborg community, Alvim, treat the sewer water for phosphor and organic material (COD), and operate according to the permit from the local environmental authorities (County Governor of Oslo og Viken) Used process water from our operation in USA (Florida and Wisconsin), send its process water to the treatment plan operated by the nearby pulp mill RYAM (Florida) and Domtar(Wisconsin). The rational of the treatment method for the process water is to reduce the organic material, measured as Biological Oxygen Demand (BOD), the company held a permit for BOD. The water discharge to 3 party is about the same as previous year due to the same production process, and will be about the same for the next 2 to 5 years. Comparison with previous reporting year - threshold: About the same <20%, lower/higher 20-50%, much lower/higher >50% . The threshold is also used for future trend.
Other	Relevant	2900	About the same	1-10	At Borregaard in Norway we have to treatment methods that are classified as other. One method has the rationale to reduce the absorbable halogenated organic component(AOX) in the effluent from the bleaching plant with alkali treatment at high temperature in a reactor. The other method has the rationale to to treat mercury polluted ground water polluted from the former use of mercury in the chlor alkali plant. Ione exchange technology is used to remove the mercury. Treated water from both the technology is monitored for volume of water and content of AOX/mercury after treatment, and are reported to the authorities as required from the the emission permit. Due to a new pipeline to the AOX reactor from the bleaching plant it was possible to increase the amount of treated water The treated volumes is about the same as previous year due to the same production process/ treatment methods. The future trend will be about the same, since we have no further plans for improvement of this technology. Comparison with previous reporting year - threshold: About the same <20%, lower/higher 20-50%, much lower/higher >50% . The threshold is also used for future trend.

W1.3

(W1.3) Provide a figure for your organization's total water withdrawal efficiency.

	Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
Row 1	5805000000	57610	100763.75629231	The water withdrawal is expected to be the same or lower in the next 3-5 years. The revenue is expected to increase due to new high end markets for our sustainable products. Thus, we anticipate that trend for total water withdrawal efficiency the next 3-5 years is increasing.

W-CH1.3

(W-CH1.3) Do you calculate water intensity for your activities in the chemical sector?

Yes

W-CH1.3a

(W-CH1.3a) For your top five products by production weight/volume, provide the following water intensity information associated with your activities in the chemical sector.

Product type
Specialty organic chemicals

Product name
Speciality cellulose

Water intensity value (m3)
95

Numerator: water aspect
Total water withdrawals

Denominator
Other, please specify (TAD (Air-dried ton))

Comparison with previous reporting year
About the same

Please explain
Borregaard is a market and competence driven supplier of high purity specialty cellulose manufactured at our production site in Sarpsborg, Norway. Specialty cellulose was chosen because this is one of our main products, both in value and in volume. The denominator is TAD, which is the measure used for selling of specialty cellulose. Total water withdrawal was used to indicate not only process water but also cooling water used to produce cellulose, thus showing the total burden from water withdrawal, and because more efficient cooling process with less water will save energy, and less process water will result in less waste water to collect and treat, the last one is an important part of our strategy to reduce the amount of process water to implement more efficient waste water treatment. Water withdrawal is calculated from measurements in the water accounting system. The water withdrawal is from the river Glomma, and the water is treated in Borregaard's water treatment plant to receive the right quality before it is used. To decide the trend for water intensity we have evaluated the changes from year to year, to obtain what is normal variation and the accuracy in the dataset from measurements and calculations/assumptions, thus less than 10% change is a about the same level. Comparison with previous reporting year - threshold: About the same <10%, lower/higher 10-30%, much lower/higher >30% Compared to last year the intensity value is about the same due to normal production years both when it comes to volume of water and of product. For the future we anticipate that the trend for water intensity will decrease due to our strategy of reduced need for process water in the bleaching plant (Borregaard Norway), which is an important process unit for production of speciality cellulose. Fresh water will be reduced by adding a dewatering unit, thus our strategy of implementing improved waste water technique can be conducted. The production volume is expected to remain the same for the next 3-5 years.

Product type
Specialty organic chemicals

Product name
Lignin biopolymers

Water intensity value (m3)
63

Numerator: water aspect
Total water withdrawals

Denominator
Other, please specify (mtds (metric tonnes dry substance))

Comparison with previous reporting year
About the same

Please explain
Our lignin-based biopolymers are alternatives to fossil-based chemicals used in a broad range of industries. Lignin biopolymers was chosen because this is one of Borregaards main products, both in value and in volume, and improvement in the environmental impact will contribute significantly to our overall impact. The denominator is mtds(metric tonnes dry substance), which is the measure used in sales of lignin biopolymers. We have used the lignin biopolymers produced at the biorefinery in Norway for this calculation, because in this unit we produce the products all the way from wood to specialised biopolymers. By choosing this operation for this calculation we get the full picture for the total water withdrawal intensity used in the production. In our other operation we buy lignin raw material from suppliers that have produced it from wood. Total water withdrawal was selected to indicate the total volume of water, including both process water, cooling water and ejector water from evaporation plant. This is further used internally to produce lignin biopolymers and this results in more efficient cooling process with less water. The results are water and energy savings, and less process water will result in less waste water to collect and treat. The volume of water is calculated from measurements in our water accounting system . The water withdrawal is from the river Glomma, and the water is treated in Borregaard's water treatment plant. To decide the trend for water intensity we have evaluated the changes from year to year, to obtain what is normal variation and the accuracy in the dataset from measurements and calculations/assumptions, thus less than 10% change is a about the same level. Comparison with previous reporting year - threshold: About the same <10%, lower/higher 10-30%, much lower/higher >30% Compared to last year the intensity was about the same. The reason was that the both production volume and total water withdrawal remained unchanged For the future we anticipated that the trend for water intensity will decrease in the next 3 to 5 years as a result from our strategy of reduced need for process water due to planned projects, the strategy is to decrease the time the lignin spray dryers is operated on only water and not product and to install a new an more efficient washing filter in the lignin production facility at Borregaard in Norway. The production volume is expected to remain the same for the next years.

Product type
Specialty organic chemicals

Product name
Bioethanol

Water intensity value (m3)
341

Numerator: water aspect
Total water withdrawals

Denominator
Ton

Comparison with previous reporting year
About the same

Please explain
Borregaard's bioethanol are renewable second generation bioethanol, used as biofuel or in the cosmetic industry, and sustainability is well documented in LCA analysis. Borregaard has produced bioethanol for more than fifty years as a by-product of our cellulose production at Borregaard's production site in Norway. Bioethanol was chosen because this is one of our main products in value, it has a relatively high water withdrawal intensity and because our strategy is to continuously improve sustainability of the bioethanol. The denominator used is ton produced bioethanol. Total water withdrawal was selected to indicate the total volume of water, including both process water, cooling water and ejector water and is calculated from measurements in the water accounting system, because more efficient cooling process with less water will save energy, and less process water will result in less waste water to collect and treat. The water withdrawal is from the river Glomma, and the water is treated in Borregaard's water treatment plant, the water withdrawal pr ton of bioethanol is high compared to lignin biopolymers, the reason for this is that a relatively high amount of cooling water is necessary and the fact that the bioethanol plant produces hot water in addition to bioethanol. Withdrawal of cooling water and ejector water is returned directly back to the river. To decide the trend for water intensity we have evaluated the changes from year to year, to obtain what is normal variation and the accuracy in the dataset from measurements and calculations/assumptions, thus less than 10% change is a about the same level. Comparison with previous reporting year - threshold: About the same <10%, lower/higher 10-30%, much lower/higher >30% Compared to last year the intensity value was about the same. Both the production volume and the water withdrawal volume increased. For the future we anticipated that for the next 2 to 5 years the trend for water intensity will decrease as a result of our strategy of increasing the efficiency of the production of hot water in the ethanol plant. The production volume is expected to remain the same for the next years.

Product type
Bulk inorganic chemicals

Product name
HCl -hydrochloric acid

Water intensity value (m3)
90

Numerator: water aspect
Total water withdrawals

Denominator
Ton

Comparison with previous reporting year
Higher

Please explain
Borregaard in Norway produces hydrochloric acid (HCl) in its chloralkali plant. HCl was chosen because the production requires high volumes of water withdrawal as cooling water. The denominator used is ton produced of HCl (36%), which is the same that is used for selling of the product. 'Total water withdrawal was selected to indicate the total volume of water and most of the water is used as cooling water. The metric is used internally to track the amount of water that returns to the recipient after cooling. A more efficient cooling process with less cooling water will save energy and improve sustainability of the HCI. In some addition water withdrawal ends up in the product (HCl 36%) and will be included in the products water consumption. Water withdrawal is calculated from measurements in the water accounting system. The water withdrawal is from the river Glomma, and the water is treated in Borregaard's water treatment plant. To decide the trend for water intensity we have evaluated the changes from year to year, to obtain what is normal variation and the accuracy in the dataset from measurements and calculations/assumptions, thus less than 10% change is a about the same level. Comparison with previous reporting year - threshold: About the same <10%, lower/higher 10-30%, much lower/higher >30% Compared to last year the intensity value was higher in 2021 (80m3/ton in 2020, recalculated). The reason was decreased production volume due to downtime in production for some periods due to upgrading of the production plant, water withdrawal was at the same level. For the future we anticipated in the next 2 to 5 years that the trend for water intensity will decrease as a result of our strategy of more efficient production due to ongoing investment in the chloralkali plant. The production volume is expected to increase in 2022 and then remain the same for the next years. The measure of success from this activities is when at 10-30% reduction in water withdrawal is achieved.

Product type
Bulk inorganic chemicals

Product name
NaOH - sodium hydroxide

Water intensity value (m3)
146

Numerator: water aspect
Total water withdrawals

Denominator
Other, please specify (dry metric tonnes)

Comparison with previous reporting year
Higher

Please explain
Borregaard in Norway produces sodium hydroxide(NaOH)in its chloralkali plant. NaOH was chosen because the production requires high volumes of water withdrawal as cooling water. The denominator used is dry metrics ton produced of NaOH, which is the same that is used for selling of the product. Total water withdrawal was selected to indicate the total volume of water, most of the water is used as cooling water that is returned to the recipient after cooling, but because more efficient cooling process with less cooling water will save energy and improve the sustainability of the HCl. Water withdrawal is calculated from measurements in the water accounting system. The water withdrawal is from the river Glomma, and the process wastewater is treated in Borregaard's water treatment plant. To decide the trend for water intensity we have evaluated the changes from year to year, to obtain what is normal variation and the accuracy in the dataset from measurements and calculations/assumptions, thus less than 10% change is a about the same level. Comparison with previous reporting year - threshold: About the same <10%, lower/higher 10-30%, much lower/higher >30% Compared to last year the intensity value was higher in 2021 (129 m3/ton in 2020, recalculated). The reason was decreased production volume due to downtime in production for some periods due to upgrading of the production plant, water withdrawal was at the same level. For the future we anticipated that the trend for water intensity will decrease as a result of our strategy of more efficient production. An ongoing investment in the chloralkali plant will reduce the energy and cooling water. The production volume is expected to increase in 2022 and then remain the same for the next years. The measure of success from this activities is when at 10-30% reduction in water withdrawal is achieved.

W1.4

(W1.4) Do you engage with your value chain on water-related issues?

Yes, our suppliers

Yes, our customers or other value chain partners

W1.4a

(W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?

Row 1

% of suppliers by number

1-25

% of total procurement spend

1-25

Rationale for this coverage

Our coverage are the 115 suppliers which we have classified as strategic, bottleneck or leverage. Classifying our suppliers help us to identify the strategic weight of our suppliers and adapt our purchasing strategies and supplier engagement. The purchasing strategy depends on two key factors: 1) The strategic importance of purchasing: volume of expenditure, Total Cost of Ownership (TCO), profitability, differentiation and value added for the company and the sales process and 2) The complexity of the supply market: monopoly or oligopoly, entry barriers, technological evolution, logistics cost or complexity etc. The rationale for the coverage is Borregaard's impact based engagement with suppliers, meaning that effort are directed towards the suppliers which represent the most significant risk or opportunity. Out of the 115 suppliers 20 are suppliers of wood, and these are the one we request to report on their water risk and management. The reason is that wood is the main raw material in Borregaard, in 2021 the cost of wood were 42 % of the companies total procurement (1.8 billion NOK). The transition to a more bio-based society as well as a growing demand for wood-based products makes the sourcing of sustainable wood raw material increasingly important to Borregaard, as a prerequisite to realize the opportunities within the market for wood based products. This is done by setting the requirement to the suppliers that the forest we buy must be certifies according to international standards for sustainable forestry, PEFC or FSC standard. 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 including standard for water impact, thus working with wood suppliers will be increasingly important. Our wood suppliers are incentivized to operate according to the standards PEFC and/or FSC, by about 5 % higher price for certified wood.

Impact of the engagement and measures of success

Borregaards wood suppliers are requested to operate according to the standards PEFC and/or FEC, and report the information requested from the standard to the certification body, including their water related impact and measures. The PEFC standard has 28 requirements which the suppliers of wood must report on, one of them is that sustainable forestry should have no negative impact on the water (river, lakes) in the forests. Information about water use is not relevant for the suppliers of wood in Norway, because the forests are natural, and uses only water from precipitating or ground and are not from forest plantations. The beneficial outcome of Borregaard requesting certified wood, and consequently the suppliers to report their certification, is that we can impact the water-risk from forestry in the Norway to the better. For the 976.000cbm harvested for the mill in Norway we have a potential impact of water estimated to an area of 500.000 hectare (calculated from a yearly growth of 2cbm/hectare). The total area of productive forest in Norway is 8,3 mill hectare, thus Borregaard had in 2021 an impact of engagement on water in forests calculated to 5 % of the productive forest area (calculated from 754.000 cbm bought in Norway in 2021). We use this information to reach our target to buy 100% certified wood, and be sure that all the aspects of the forest are taken care of, including the forests impact on water and role in the water circuit. Another beneficial impact of the certification criteria being fulfilled by our suppliers is that we can use it towards our stakeholders, in particular investors and customers, to document the sustainability impact, including verifying the low negative impact the supply chain of our major raw material has on water. The success is measured by the amount of certified wood we purchase. If the wood we buy is certified, the water impact is taken into account. In 2021, we purchased 99% certified wood, whilst the remaining 1% was controlled in accordance with the PEFC and/or FSC® standards. When the target to increase certified wood from 99% to 100% is achieved, all of our wood suppliers are accounting for their water related impacts, and we will know that they are using the standard required to have a sustainable impact on water from forestry.

Comment

W1.4b

(W1.4b) Provide details of any other water-related supplier engagement activity.

Type of engagement
Onboarding & compliance

Details of engagement
Requirement to adhere to our code of conduct regarding water stewardship and management

% of suppliers by number
76-100

% of total procurement spend
76-100

Rationale for the coverage of your engagement
One of our water-related supplier engagement activities is to have our suppliers to sign our Supplier Code of Conduct (SCoC). In which we require the supplier to ".....work to achieve energy and water efficiency and minimize harmful discharge, emissions, and waste production in a lifecycle perspective. We shall characterize and treat wastewater and solid waste appropriately, in accordance with applicable laws and regulations." And to ".....agree to communicate the same expectations and requirements described in this SCoC to our own suppliers and business relationships" We use this type of engagement because by forwarding our SCoC to the suppliers we are communicating our expectations and requirements to some of our most important stakeholders, the suppliers. And by signing it, the supplier commit to comply with the requirements, including passing on the expectations and requirements to his own suppliers and business relations. By requesting this from the suppliers, we are increasing awareness about water related issues, and contributing to transparency in the supply chain. We forward the SCoC to all new suppliers as part of the onboarding process, and we seek compliance amongst existing suppliers by requesting them to sign the SCoC if not already signed. The coverage of our water-related supplier engagement are the 115 suppliers which we have classified as strategic, bottleneck or leverage. Classifying our suppliers help us to identify the strategic weight of our suppliers and adapt our purchasing strategies and supplier engagement. The purchasing strategy depends on two key factors: 1) The strategic importance of purchasing: volume of expenditure, Total Cost of Ownership (TCO), profitability, differentiation and value added for the company and the sales process and 2) The complexity of the supply market: monopoly or oligopoly, entry barriers, technological evolution, logistics cost or complexity etc. The rationale for the coverage is Borregaard's impact based engagement with suppliers, meaning that effort are directed towards the suppliers which represent the most significant risk or opportunity.

Impact of the engagement and measures of success
The beneficial outcome of this engagement activity is increased awareness in the supply chain. Another beneficial outcome is transparency in the supply chain. And our water-related supplier engagement activity results in commitments. From Borregaard and from our suppliers. When we set water related requirements to our suppliers, and they pass on the requirements to their suppliers, water related requirements have to be taken into account and be adhered to. And when we set goals and requirements, and report externally on these, we commit to monitor and follow up progress. Our measure of success of this supplier engagement is the number of our suppliers that have signed the SCoC. We measure success by the number of new suppliers that have signed the SCoC. This is one of the KPI that is measured monthly. In 2021 95% of all new suppliers had signed the SCoC, non-critical and unclassified suppliers excluded. In addition, a large quantity of our suppliers have been with us for a long time. Some from before we started requesting new suppliers to sign the SCoC. We are continuously working towards all our suppliers having signed the SCoC. And we are monitoring and measuring our progress. In 2021 88% of all of our suppliers had signed the SCoC, non critical and unclassified suppliers excluded.

Comment

W1.4c

(W1.4c) What is your organization's rationale and strategy for prioritizing engagements with customers or other partners in its value chain?

Many of Borregaards current and future B2B customers sell products/chemcials into water intensive industries like agriculture, mining and oilfield. Borregaard consider this as an opportunity for our specialised lignin biopolymer products, and a growing market, as our customers get more aware of the water-related risks, and look for more sustainable alternatives. Our R&D department has received funding from The Research Council of Norway (RCN) of 19 MNOK and will cooperate and engage with different Universities to find new and better solutions in our lignin biopolymer applications for water intensives industries. Our customers are engaged as they sell products to water intensive industries, this is relevant because Borregaard have lignin biopolymers that have the potential for reducing their water-related risk in different applications for agriculture, mining and oilfield. Our engagement with customers will increase as the progress in the project are going forward. For our lignin biopolymer products this will represent new and more sustainable applications, we expect our future price premium for the product to increase.

The strategy to engage with the value chain is to cooperate our R&D department together with different universities to find new and better solutions in our lignin biopolymer applications in water intensive industries. The plan for realization is to finish the project in 2023, following the approved project plan from the RCN. Then there is an estimated ramp up in sales volume in a mid-term time perspective(2030), meaning that customer engagement will increase.
How engagement success measured :

The project aims to directly address this innovation-gap between sustainable and petroleum-based performance additives by understanding: (1) how to modify lignin to produce new diverse structures and functionality, and; (2) how optimize performance in targeted water-intensive applications. In the mid-term future they represent a positive impact on the EBITDA.

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?
No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

No

W3. Procedures

W-CH3.1

(W-CH3.1) How does your organization identify and classify potential water pollutants associated with its activities in the chemical sector that could have a detrimental impact on water ecosystems or human health?

Our general approach to determining our impact is through the company's environment management system, including classification of risk according to ISO31000. We are reporting environmental issues according to requirements in the GRI standard, and inn accordance with our overall EHS and Climate policy. Our operation in Norway and in Germany are certified by the environmental management system ISO 14001. This ensure that water related risks from pollutants and their regulatory requirements are handled in a systematic way in our management system. A program for measuring all pollutants, stating the frequency based on the environmental risk, are installed and reported in the emission accounting system to control the level of pollutants to the requirement in the emission permit.

Our main impact on water ecosystems is from our production units. Our biggest operational unit, the biorefinery in Norway has the major share of the impacts, 95%. The other units are much smaller and are processing lignin raw material into various biopolymer products, as liquid or powder. Emissions from the various production units are regulated by national and/or local authorities, in process of setting permits risk of emission of water pollutant is evaluated based on the potential of emission of pollutants from process, the barriers for avoiding emission to water and if best available treatment technologies (BAT) are installed. Environmental factors are integrated into the sourcing decisions and the assessment of suppliers. All new suppliers shall sign the Supplier Code of Conduct and be assessed with respect to responsible sourcing.

Best available Techniques Reference Document standards(BREF's)are used for emission permit settings in EU/EEA countries, the documents describe different manufacturing processes, their respective operating conditions and emission rates and pollutants that must be regulated. Based on the latest review of these standards, Borregaard's operations in Norway received a new discharge permit from 01.07.2019. The permit has stricter limits for several substances in the effluent, including sub-streams, in shorter average periods. This means that the number of single limits in the permit has increased. The new permit (www.norskeutslipp.no) for organic material to water (COD) in the effluent is reduced from 69 tonnes to 59 tonnes per 24-hour period (on average over the year) in order to comply with BAT levels for emissions to water. Components in the effluents to water are measured after Norwegian standards or International standards. The most important parameters to water from our operations are organic material (COD, BOD, suspend solids/fibers), Adsorbable Organic Halogen (AOX), Copper and some other metals, Nutrients (Nitrogen and Phosphor).

The EU Water Framework Directive (WFD) requirements and standards are used by Norwegian Institute for Water Research (NIVA) to monitor the river Glomma outside Borregaards premises. This monitoring shows that emissions of easily degradable organic matter (BOD) from our biorefinery have caused a proliferation of bacteria covering riverbed sediments close to the plant. This causes poor oxygen conditions, which has implications for the growth of the river Glomma's wild salmon stock. As a result, its ecological status is classified as poor and can be defined as a river with water stress. NIVA's measurements of chemical status in accordance with the WFD standards show a good status. New analyses show that the conditions in the river Glomma downstream from Borregaard have improved, which shows that the reduction in emissions of several substances has had an effect. The report is public available.

The potential environmental impact of Borregaard's process wastewater has recently been investigated, and the report was sent to the Norwegian Environment Authorities in 2021. Of Borregaard's regulated discharge components to water, it is the discharge easily metabolizable organic material, measured as BOF and KOF, that has the greatest negative environmental impact on the aquatic environment outside Borregaard. The other regulated discharge components were well diluted and mixed into Glomma. After mixing, most concentrations, except Cadmium (Cd), were below the environmental quality standard (AA-EQS) approx. 50 m from the discharge points. For Cd, the concentrations in the process wastewater were equal to AA-EQS about 150 m from the discharge point to Glomma . Borregaard will improve the discharge water quality by cutting the effluents of COD. A plan for how to cut the effluents is sent to the Norwegian Environmental Authorities. The Plant Director of Borregaard (Chief operating officer) is responsible for the plan for cutting effluents of COD.

Chronic, acute toxicity, coverage, persistence or bioaccumulation are not characteristics of the impact on the river Glomma from the process waste water.

W-CH3.1a

(W-CH3.1a) Describe how your organization minimizes adverse impacts of potential water pollutants on water ecosystems or human health. Report up to ten potential pollutants associated with your activities in the chemical sector.

Potential water pollutant	Value chain stage	Description of water pollutant and potential impacts	Management procedures	Please explain
COD, Chemical Oxygen Demand	Direct operations	Effluents of organic material to water, measured as COD, impact the water quality in the river Glomma negatively. According to the definition in GRI 303, the impact of the effluent on the ecological status of the river is defined as water stress. The EHS policy guides the water-related risk the impact discharge of effluents has on the ecological status in the river Glomma. Borregaard and The Norwegian Institute of Water Research (NIVA) monitor the river Glomma in accordance with the requirements and standards in the EU Water Framework Directive (WFD). This monitoring shows that emissions of easily degradable organic matter (COD/BOD) from our biorefinery have caused a proliferation of bacteria covering riverbed sediments close to the plant. This causes poor oxygen conditions, which has implications for the growth of the river Glomma's wild salmon stock. As a result, its ecological status is classified as poor and can be defined as a river with water stress. (Ref: ISBN 978-82-577-7305-2)	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	This explanation is for Borregaards operation in Norway. Compliance: Best available Techniques Reference Document standards (BREF's) are used for emission permit settings in EU/EEA countries, the documents describe different manufacturing processes, their respective operating conditions and emission rates. Based on the latest review of these standards, Borregaard's operations in Norway received a new discharge permit from 01.07.2019. The permit has stricter limits for several substances in the effluent, including sub-streams, in shorter average periods. This means that the number of single limits in the permit has increased. The new permit (www.norskeutslipp.no) for COD in the effluent is reduced from 69 tonnes to 59 tonnes per 24-hour period (on average over the year) in order to comply with BAT levels for emissions to water. Components in the effluents to water are measured after Norwegian standards or International standards. Measures: Borregaard will improve the discharge water quality by cutting the effluents of COD more, this will be done both with measures to prevent spillages but also with new treatment techniques. A plan for how to cut the effluents has been sent to the Norwegian Environment Authorities. The measure of success is when COD is reduced in to a 25-30% lower level in 2025 compared today level (average 58 tons COD/day).
Cu, Copper	Direct operations	Borregaard Norway uses copper as a catalyst in the production process. We have reduced our emissions of copper during 2020, and the recovery rate is more than 80%. Copper is classified as a priority substance that the Environmental Authorities will reduce, thus the emissions should be as low as possible. Copper in high concentrations is toxic to aquatic environment. Copper in the emissions from Borregaard is well below environmental quality standard values (EQS-values) for copper, meaning that the concentration of cobber is lower than the environmental impact concentration, thus the chemical status of the river Glomma according to the Water Frame directive is classified as good status. Even if there is no negative impact from the copper emission to the river Glomma, Borregaard's strategy is to reduce the emission has much as possible. (Ref: ISBN 978-82-577-7305-2)	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	This explanation is for Borregaards operation in Norway Compliance: Best available Techniques Reference Document standards (BREF's) are used for emission permit settings in EU/EEA countries, the documents describe different manufacturing processes, their respective operating conditions and emission rates. Based on the latest review of these standards, Borregaard's operations in Norway received a new discharge permit from 01.07.2019. The permit has stricter limits for several substances in the effluent, including sub-streams, in shorter average periods. This means that the number of single limits in the permit has increased. The new emission permit for copper is demanding and we exceeded the short-term limits 35 times in 2020. Measures: Copper in the waste water is measured according to the requirement from the Environment Authorities. Environmental investments and process measures resulted in reduced copper emissions in 2020 and the emissions are expected to be reduced further in 2021, a 35% reduction compared to 2019 (from 11.6 kg/day to 7.5 kg/day), thus our measure of success will be achieved in 2021.
AOX, Adsorbable Organic Halids	Direct operations	Adsorbable Organic Halides (AOX) is a measure of the organic halogen load at a sampling of waste water. The procedure measures chlorine, bromine, and iodine as equivalent halogens. The AOX in the waste water sample stems from the use of chlorine dioxide in the bleaching plant, to remove lignin from the cellulose by selective oxidation of lignin. This result in some low molecular chlorinated lignin structures in the waste water. These structures has the potential for ending up as priority substances like dioxines. Thus the concentration is kept as low as possible. Mussels in the sea close to the operation will be monitored for the content of dioxines according to the WFD, it is expected that the results will be low and in accordance with environmental quality standards.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	This explanation is for Borregaard's operation in Norway. Compliance: Best available Techniques Reference Document standards (BREF's) are used for emission permit settings in EU/EEA countries, the documents describe different manufacturing processes, their respective operating conditions and emission rates. Based on the latest review of these standards, Borregaard's operations in Norway received a new discharge permit from 01.07.2019. The permit has stricter limits for several substances in the effluent, including sub-streams, in shorter average periods. This means that the number of single limits in the permit has increased. Borregaard comply with the permit for AOX. Measures: AOX in the waste water is measured according to the requirement from the Environment Authorities. To remove some of the AOX the waste water is treated in a AOX reactor with alkali. Measures to optimize the recipes to use less chlorine dioxide is also ongoing, this could be done by improving process control and washing sequences. The measure of success is when AOX is reduced in to a 25% lower level in 2025 compared with today level (average 0.27 tons day to a level below 0.2 tons pr day).
N, Nitrogen	Direct operations	The function of nitrogen in waste water is that it is a nutrient for organisms mainly in the sea water. Thus we are not measuring any effect from Nitrogen directly in the river Glomma. Nitrogen in the waste water to the river Glomma stems from nitrogen containing raw materials. In the sea there is several sources for nitrogen emission, from communities, industry and farming. The impact of Nitrogen is overstimulation of growth of aquatic plants and algae.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	This explanation is for Borregaards operation in Norway Compliance: Best available Techniques Reference Document standards (BREF's) are used for emission permit settings in EU/EEA countries, the documents describe different manufacturing processes, their respective operating conditions and emission rates. Based on the latest review of these standards, Borregaard's operations in Norway received a new discharge permit from 01.07.2019. The permit has stricter limits for several substances in the effluent, including sub-streams, in shorter average periods. This means that the number of single limits in the permit has increased. Borregaard comply with the permit for Nitrogen. Measures: Nitrogen in the waste water is measured according to the requirement from the Environment Authorities. Borregaard will reduce the nitrogen level in the effluents further by increased treatment for some of the waste water that have the highest content of Nitrogen. The measure of success is when Nitrogen is reduced in to a 22 % lower level in 2025 compared today level today (average 321 kg/day to a level below 250 kg/ pr day).
P, Phosphor	Direct operations	Phosphor is a nutrient for living organisms, and occur naturally in our main raw material wood, but is also added in the waste water treatment plant and in the ethanol plant. Phosphor in the waste water can result in eutrophication of the river Glomma. The eutrophication index, PIT, for periphyton is primarily affected by phosphorus, falling from "Good" ecological status upstream of Borregaard to "Moderate" outside Borregaard. The main reason is assumingly the decay of the thick mats of the bacteria, that release a surplus of nutrients to the periphyton, hence favoring eutrophic species. This is a indirect effect of the organic material in the waste water, thus Borregaard will prioritize the reduction of COD and have less focus on phosphor. (Ref: ISBN 978-82-577-7305-2 .)	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	This explanation is for Borregaards operation in Norway Compliance: Best available Techniques Reference Document standards (BREF's) are used for emission permit settings in EU/EEA countries, the documents describe different manufacturing processes, their respective operating conditions and emission rates. Based on the latest review of these standards, Borregaard's operations in Norway received a new discharge permit from 01.07.2019. The permit has stricter limits for several substances in the effluent, including sub-streams, in shorter average periods. This means that the number of single limits in the permit has increased. Borregaard comply with the permit for Phosphor. Phosphor in the waste water is measured according to the requirement from the Environment Authorities. Measures: In the recent years we have done several measures to reduce the content of phosphor in our emissions. The major activity was the changes from waste oil to liquid natural gas as support fuel in the bio boiler, waste oil contains phosphor. Since 2010 the phosphor content in the waste water has been reduced by 73%. We have already achieved a lot for our emission reduction of phosphor, our future over measure of success is thus modest, and is achieved when Phosphor is reduced in to a 10 % lower level in 2025 compared today level today (average 20 kg/day to a level below 18 kg/ pr day).

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Value chain stage
Direct operations
Supply chain

Coverage
Full

Risk assessment procedure
Water risks are assessed as part of an established enterprise risk management framework

Frequency of assessment
Annually

How far into the future are risks considered?
More than 6 years

Type of tools and methods used
Tools on the market
Enterprise risk management
International methodologies and standards

Tools and methods used
EcoVadis
WWF Water Risk Filter
ISO 31000 Risk Management Standard
Environmental Impact Assessment
Life Cycle Assessment
IPCC Climate Change Projections
ISO 14001 Environmental Management Standard

Contextual issues considered
Water availability at a basin/catchment level
Water quality at a basin/catchment level
Stakeholder conflicts concerning water resources at a basin/catchment level
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats
Access to fully-functioning, safely managed WASH services for all employees

Stakeholders considered
Customers
Employees
Investors
Local communities
NGOs
Regulators
Suppliers
Water utilities at a local level

Comment
Risks are managed through established management procedures and loss prevention programmes (ISO 31000). To evaluate possible water availability risks, Borregaard has conducted a company-wide water scarcity risk assessment of all facilities. In regards of local risks at its main operating unit in Sarpsborg, Norway, Borregaard uses ISO 14001 as tool to manage operations. Borregaard also conduct Life Cycle Assessment of our products, water use and impact on water is a part of the assesment.

W3.3b

(W3.3b) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

Sustainability is a key component of Borregaard's business model, and one of our strategic priorities is to have continued emphasis and work along the entire value chain to control and improve the environmental aspects. We represent a water intensive industry, but we produce products that can have positive impact on water intensity in our customers processes. This is the reason why we have selected the whole value chain for our risk assessment approach to water related risks, current, short term (1-4 years), medium-term (4-9 years) and long-term (9-29) as relevant time horizons.

Tools and methods used:

Borregaard has a multi-disciplinary risk management process (ISO31000), contribute to the identification, analysis and handling of risks across the whole value chain, including water-related. Water scarcity risks have been evaluated by using The WWF Water risk filter, it is a well know and established method to get a reasonable overview of water related risks in areas where we operate and where our major suppliers (wood, energy, water, chemicals and transportation) operate. A climate scenario analysis (IPPC climate change projections) has been used for understanding how water-related risks in the whole value chain can be impacted in 2030-2050 time horizon. Water-related risks at the operational units and assets are managed within the ISO14001 environmental system. LCA assessment is used as tool for documenting the impact on water quality and the amount of water used for production or use of products and is used in the communication with our customers to identify water related risk. Ecovadis is used for monitoring the environmental performance, including performance and risk related to water, from our suppliers, and we report to inform the value chain about our own performance.

Outcomes of the risk assessment:

Borregaard identifies and assesses water-related risk at asset level within the framework of our common process for risk and each member of the Group Executive Management is responsible within their respective areas. At company level the Group identifies sources of risk, areas of impacts, events, and potential financial or strategic consequences and implement mitigation activities. The risk identification work starts with the initiating phase, in this phase of the process, the acceptance criteria associated with the risk is set to ensure the correct probability and consequence scales for the business. The sequence is then to assess, analyse, plan for initiatives, implement the initiatives and review them. To find the severity of the risk, there is a set of predefined criteria for how risks are assessed using a risk register scale. The probability and the consequence of the risks are rated as “Low”, “Medium” or “High” and are visualized in a matrix. Once a risk has been assessed and analysed as high enough, the outcome is to implement initiatives to mitigate the risk. As outcome of the risk assessment, the identified risks which have substantive impact is presented in an aggregated risk picture covering the entire Group’s operations and value chain. The owner of the risk factors implements relevant mitigation strategies and activities and consult the Group Executive Management in the process. This process is relevant for all parts of our value chain.

Contextual and stakeholder issues:

Contextual issues are analysed in the yearly stakeholder and materiality assessment according to the GRI standard and ISO14001 environmental management system. Borregaard has selected to survey groups, organisations and individuals that are either impacted by our company’s operations and value chain or which, in a variety of ways, have an impact on the company’s strategy and goal achievement. We concluded after an evaluation, that the most important water- related stakeholders includes current or potential customers, investors and lenders, employees, regulators, suppliers, local communities including its water utilities, NGOs and the media. We assess their view and concerns about water-related issues through regular dialogue. We see that our stakeholders are concerned about water quality, availability, regulatory issues, ecosystems, conflicts impacted from water and the implications from water for raw materials. The reason why they are concerned are mainly that water related issues can have impact on the sustainability profile of the company and its products, both water intensity and emissions, our business contingency for physical risks and future financial results. The outcome from the stakeholder and materiality assessment is that "water impacts and effluents" are one of our main materiality topics. The topic is important both to our stakeholders and to Borregaard and points out our strategic priorities for improving our impact on water. In our Annual Report we give an account of Borregaard’s systematic work to the material topic and risk reducing activities, as identified in our risk assessment.

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, both in direct operations and the rest of our value chain

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

To evaluate the **magnitude** of impact on our business at the corporate level we use the effect on the EBITDA. EBITDA is defined by Borregaard as operating profit before depreciation, amortisation and other income and expenses. The **magnitude** of the impact has 3 threshold levels:

Low EBITDA effect: 0-25 mill NOK

Medium EBITDA effect: 25-50 mill NOK

High EBITDA effect: > 50 mill NOK

In 2021 EBITDA was 1,372 mill NOK , a loss in EBITDA of 50 mill, would have reduced the EBITDA margin by 0.8%-points from 23.6% to 22.8 %. A 0.8%-points drop (or increase) in Borregaard's total EBITDA margin from a single indicator is, in the company's opinion, **a substantive impact**, because this level would probably have influenced our stock price. Borregaard's different business units are closely linked together as they mainly are different parts of the large integrated biorefinery in Norway. As a consequence, it makes sense for Borregaard, as well as for shareholders and customers, to primarily consider the size of the impact on the totality instead of the different business units. The definition is valid for impacts in the **whole value chain** that the Borregaard Group operates in.

The **probability** of the EBITDA impact above is considered for the following threshold levels:

Low probability: 0-50%

Medium probability: 50-75%

High probability: 75-100%

This is combined to a risk matrix of 3X3, to evaluate the magnitude and the probability of financial impact from water-related risk . The combination of high and medium probability with high EBITDA and the combination of high probability with medium EBITDA is defined **as the substantive financial impact (**red in the matrix for row 3, column 2 and 3 and row 2, column 3). The time horizon of the assessment of the impact covers a period of 3 years ahead of the reporting year (4 years).

Water-related risks are integrated into Borregaard's multi-disciplinary risk management process, and water-related issues are assessed with a **frequency** more than once a year.

The threshold for conducting mitigation actions have been set to risks that are defined as having substantive financial impact as defined in the risk matrix. However, mitigation actions could be carried out also below this threshold to avoid a substantial risk in a medium-term and long-term perspective, impacts considered as a substantive financial impact below the threshold value in the short-term period, could have higher impact in longer time horizon.

To identify a substantive **change** in the short-term period, the same risk matrix as described above is used for evaluating the impact from water-related risk. When a risk is moved to the red area, the **change** is defined as substantial.

Borregaard's highest water related risk is the emission of organic material (COD) from the Borregaard manufacturing site in Norway to the river Glomma which has negative impact on the ecological status of the river. A capex plan has been identified in the strategic period to reduce the emission of COD to a level where ecological status will improve, as the emission will be reduced by 20-30%. A substantive change could be if the authorities dose not accept our risk mitigation plan for reduction in emissions, and we have to speed up capex or reduce/change production. Another identified change with substantive impact would be a major spill to water, i.e. hazard risk at pulp mill causing disruption of operations and possible penalties and recovery payments and reputation loss.

The definition of substantial impact applies t**o the whole value chain**. Borregaard suppliers' usage of water in their operations depends the type of raw material/chemical, for our commodities and main raw materials we have several suppliers. In sourcing of wood, Borregaard buy mainly FSC/PEFC forest certificated wood, thus water management is taken care of. In 2021, 99% of wood came from certified sources, and our target is to get all wood as certified (from 2022).

For water-related risk we have used WWF risk filter for our operations and in addition the topic are included in climate scenario analysis. Many of Borregaards current and future B2B customers sell products/chemcials into water intensive industries like agriculture, mining and oilfield. Borregaard consider this as an opportunity and a growing market for our specialised lignin biopolymer products, as our customers get more aware of the water-related risks and look for more sustainable alternatives, this could represent a long term substantial change in opportunities for new products.

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	1	1-25	The number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on our business is 1 of 6 production facilities (17%) in Borregaard. This is the production facility in Sarpsborg, Norway, and represent above 76% of the revenues in the company, and is our main production unit. The production site in Norway has the main withdrawal of water, 95% of the companies total withdrawal, the production site is a biorefinery where water is an important resource in the production process. Water is used for cooling, steam production, washing and transportation of pulp/biomass. The production site in Czechia, Germany and two in USA uses 5% of the total withdrawal of water. The production process is mainly drying of liquid biopolymers in spray driers. At the production site in Florida sufficient amount of ground water from the Floridan aquifer is available. The exposure to water risk and the potential to have substantive or strategic impact from water risk is considered to be low. The potential business impact associated with the site in Sarpsborg results from negative impact the effluent discharge has on ecological status in the river Glomma. According to the EU Water Framework Directive (WFD) the ecological status is classified as poor. The river Glomma also represent a positive business impact, due to the large amounts of water available from the river, water withdrawal is sustainable and represents an opportunity for producing sustainable products, compared to areas in the world where water scarcity is an risk/or increasing risk due to climate change.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?

Country/Area & River basin

Norway	Gloma

Number of facilities exposed to water risk
1

% company-wide facilities this represents
1-25

Production value for the metals & mining activities associated with these facilities
<Not Applicable>

% company's annual electricity generation that could be affected by these facilities
<Not Applicable>

% company's global oil & gas production volume that could be affected by these facilities
<Not Applicable>

% company's total global revenue that could be affected
71-80

Comment
The number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on our business is 1 of 6 production facilities (17 % of facilities). This is the production facility in Norway, and represent above 75% of the revenues in the company, and is our main production unit. The production site in Norway, has the main withdrawal of water, 95% of the companies total withdrawal, the production site is a biorefinery where water is an important resource in the production process. Water is used for cooling, steam production, washing and transportation of pulp/biomass. The production site in Czechia, Germany and two in USA use 5% of the total withdrawal of water. The production process is mainly drying of liquid biopolymers in spray driers. At the production site in Florida sufficient amount of ground water from the Floridan aquifer is available. The potential business impact associated with the site in Norway, Sarpsborg results from negative impact the effluent discharge has on ecological status in the river Glomma. A capex plan has been identified in the strategic period to reduce the emission of COD to a level where ecological status will improve, as the emission will be reduced by 20-30%. According to the EU Water Framework Directive (WFD) the ecological status is classified as poor. Bad ecological status can be counted as "water stress", because according to the definition, water stress can refer to the availability, quality, or accessibility of water. The long-term goal of the WFD regulation is to achieve a good ecological status in the river Glomma in 2033, thus Borregaard's long term goal is to reduce the ecological water stress, and achieve a good ecological status in the river Glomma in 2033. The river Glomma also represent a positive business impact, due to the large amounts of water available from the river, water withdrawal is sustainable without any water stress when it comes to availability and accessibility, and represents an opportunity for producing sustainable products, compared to areas in the world where water scarcity is an risk/or increasing risk due to climate change.

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Norway	Gloma

Type of risk & Primary risk driver

Regulatory	Regulation of discharge quality/volumes

Primary potential impact
Increased cost of capital

Company-specific description
Borregaard's main site, the biorefinery in Norway generates emissions of organic matter (measured as COD) to the river Glomma. Emissions of organic compounds to water (chemical oxygen demand (COD)) affect the aquatic environment in the river Glomma. The organic material stems mainly from the washing and processing of biomass into advanced products. The regulatory risk could impact the Capex and our improved sustainability strategy for water-related issues negatively, thus the risk reducing activities and emission reductions of COD is monitored at corporate level. Discharge quality to the river Glomma is regulated in the emission permit for Borregaard in Norway, which was updated in 2019 and is according to the regulatory demands in the the EU's IPPC directive and described in the relevant BREF standards (Best Available Technique Reference). But regulatory compliance to the EU Water Framework Directive (WFD) is not met, but must be met before 2033. In addition we expect a stricter permit due to revision of environmental regulations under the framework European Green Deal - with it's zero pollution vision for 2050. Borregaard and the Norwegian Institute for Water Research (NIVA) monitor the river Glomma in accordance with the requirements and standards in WFD. This monitoring shows that emissions of easily degradable organic matter (BOD) from Borregaard have caused a proliferation of bacteria covering riverbed sediments close to the plant. This causes poor oxygen conditions, which has implications for the growth of the river Glomma's wild salmon stock. As a result, its ecological status is classified as poor. Due to the ecological status in Glomma and the requirements in WFD, Borregaard has sent a Capex plan to the Norwegian Environment Authorities on how the emission can be cut to a 25-30% lower level in 2025 compared to 2021(average 55 tons COD/day). It is to early to tell if the cuts are sufficient to be compliant with the requirement in the WFD and to potential changes in permit due to the revision of environmental regulations, like the Industrial Emission Directive (IED) under European Green Deal. We have started to elaborate how we can reduce the emission of COD further from 2025-2030. One method is evaporation and incineration of the remaining waste water, and reuse the hot water from the evaporation in the production process to save water and energy, this will give additional reduction of COD of in the range 35-50% compared to 2021.

Timeframe
More than 6 years

Magnitude of potential impact
Medium

Likelihood
Likely

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)
625000000

Potential financial impact figure - maximum (currency)
1125000000

Explanation of financial impact
We have identified several projects, smaller and larger, and in different production units at Borregaard site in Norway, that can reduce emission of COD to the river Glomma. Some projects are in the study phase and some of the project are in the implementation phase for implementation in 2022. There is still some uncertainty both the potential for emission reduction and in the capex. In total it is 6 different project is identified and will be finished before 2025, the emission target of a reduction between 25% to 30 % from the level inn 2021 will be achieved in the end of 2025. The plan is public and is sent to the Norwegian Environmental Authorities. We have started to investigate the Capex for the next step of emission reduction, with the installation of a "Liquid waste Incinerator" together with evaporation technology with recovery of hot water/Energy for reuse (LIWI). The cost of the LIWI technology is uncertain. Capex for emission reduction projects installed before end of 2025: Spill collection in to plants, 2 projects (1 in implementation and 1 in study phase) : NOK 15 mill Incineration of waste water in Borregaard waste incineration plant (study phase): NOK 10 mill Improved waste water to anaerobic treatment plant (implementation phase): NOK 5 mill Improved evaporation (implementation phase): NOK 80 mill New wash filter for improved washing (study phase): NOK 15 mill The total Capex of projects: 15+10+5+80+15= NOK 125 mill Capex of LIWI total 2022-2027 assumption: NOK 500 mill to NOK 1000 mill Potential financial impact minimum: 500 + 125 = NOK 625 mill Potential financial impact maximum: 1000 + 125 = NOK 1125 mill The magnitude of potential impact: Some of the capex for the project is within annual depreciation, capex will have impact on return of capital employed (ROCE) and Earnings before interest, taxes, and amortization (EBITA). It is anticipated that the projects will have their major investment burden in the period 2022-2027. With Borregaard substantive financial impact definition for Borregaard Group the magnitude will be high, as it for some years the investment will sum up to 25% of total investments in the Group.

Primary response to risk
Comply with local regulatory requirements

Description of response
Our response strategy to mitigate the regulatory risk has been to make and investment plan with projects that can reduce emissions of COD from Borregaard in Norway, we expect most of the Capex to be applied in the years 2024-2028. The reductions in emission will follow an annual plan, with 25-30% reduction in end of 2025 and 35-50% in 2030. Our response is underway, planned target for 2021 was achieved with a reduction of 2 tons of COD/day. Borregaard has established a cross functional team with resources from R&D and process experts from production that have made a plan to reduce the emission of COD to the river Glomma. A steering committee chaired by the Plant Director (Member of Executive Management Group) review the progress at a regular frequency and make investment decisions. We have sent an action plan to the Norwegian Environmental Authorities with estimated capex, effect on COD/emissions and time to implement for for each activity for the activities in the period 2021 to 2025. The team follow the effect of the implementation both with measurement of the actual reduction of COD and measurements of the response for the ecological status. In addition we continue the work with new emission reduction activities and evaluate the potential for further reduction, beyond the activity plan submitted to the Norwegian Environmental Authorities. This will improve our organization's resilience at the site in Sarpsborg and at corporate level since most of our products are produced at the site and water-related environmental impact is an topic of interest of stakeholders like customers and investors. In our long-term strategic business plan, the financial planning for water-related issue are included. The decision to include reduction in COD in the financial planning is because the Capex will be a substantive part of the investment budget until >2030. Our response strategy will improve the ecological status in the river Glomma and will have an important contribution to maintaining the Atlantic salmon stock in the river and has a positive contribution to UN Sustainable Development Goal number 14. The implementation of WFD in Norway is organised in local areas that has common interest in a special river or lake area, Borregaard participates in a working group organised by the nearby municipalities, called "Glomma Sør". In this areas water scarcity is identified as low risk, water stress from low ecological status is the main risk.

Cost of response
5400000

Explanation of cost of response
Pre project and project cost including use of consultant for the investment plan for reduction of COD, are a part of the Capex cost, thus not included in the cost of our response. The timescale of the cost of the response is pr year, and the calculations below is the cost in 2021. It is likely that the yearly cost to be at the same level within the next 6 years. •Operating cost for R&D running a pilot plan for waste water treatment. One fulltime FTE + operating cost = NOK 1,2 mill pr year •Operating cost for monitoring effect of COD in Glomma: Norwegian Institute for Water Research monitor in accordance with the WFD = NOK 0,8 mill pr year. • Operating costs of a salmon cultivation facility, commitment to 2032: Emissions of COD has caused a proliferation of bacteria covering riverbed sediments, which causes conditions that has implications for the growth of the wild salmon stock = NOK 1mill pr year •Operating cost in the plant due extra COD measures like extra washing that can increase recipe/product cost (kf) = NOK 2,4 mill pr year (2021) Total cost of response = 1,2 +0,8 + 1+2.4 = NOK 5,4 mill

W4.2a

(W4.2a) Provide details of risks identified within your value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Norway	Gloma

Stage of value chain
Supply chain

Type of risk & Primary risk driver

Acute physical	Flood (coastal, fluvial, pluvial, groundwater)

Primary potential impact
Increased operating costs

Company-specific description
The river Glomma is important for supply by boat of raw materials like salt, wood, limestone, sodium hydroxide and sulphuric acid to Borregaards port Melløs in Norway. Transportation on inland waterways can potentially become more unpredictable in the future because more frequent high-water levels are expected by 2050. In Sarpsborg, where the 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). The number of days Melløs Port will be closed due to flooding or water flow will increase. Historically the port has been closed in a period in the spring time due to snow melting. With a more wet climate, we expect the periods when the port is closed to increase. The average flow of the river Glomma is 577 cbm/sec, the port is closed in periods when the flow increases to 1500 cbm/sec. At our production unit in Germany, Karlsruhe, which has transport of raw materials on the river Rhine, we have experienced the opposite phenome to flooding, drought. In dry summers, like 2018, the water level was too low to enable transportation. Flooding and drought will impact the the logistic cost (operating cost) for the supply of raw materials and lead to delays in the value chain: •Ships have to go to other ports, and we will have extra cost from unloading, handling and transportation of the goods by trucks •Load factor of ships can decrease and potentially increase the number of shipments from the sourcing locations •Shortage/delay in deliveries can result in production downtime We have already implemented a response strategy with flexible logistics (several transportation routes and transportation modes). As a part of the contingency we have increased storage volume for some of the raw materials in periods with high risks of flooding. This mitigation activities have limited the risk of disruptions in the value chain to low impact at corporate level.

Timeframe
More than 6 years

Magnitude of potential impact
Low

Likelihood
About as likely as not

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

Potential financial impact figure (currency)
6400000

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

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

Explanation of financial impact
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: 200,0000 NOK pr Boat * 7 extra days = 1,4 M NOK. Potential increased storage cost close to the plant is estimated to NOK 5 mill /year (rent of more storage capacity). The total financial impact is then: Increased unloading cost NOK 1,4 mill + Increased storage cost NOK 5 mill = NOK 6 ,4 mill 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.

Primary response to risk

Direct operations	Include in Business Continuity Plan

Description of response
Our response to the risk of increased flooding or drought, is expected to prevent the risk of increased cost from flooding/drought for the existing and future operations, by transferring the risk to other transportation modes and to increase storage volume of raw materials. The response will have increased cost compared to a normal situation, but will have moderate impact compared to the risk of production downtime. The water security related to flooding, or drought for transportation on inland waterways, can potentially become more unpredictable in the future, thus the mitigation activities will improve the water security for Borregaard. Our response contributes to UN Sustainable Development Goals ‘Decent work and economic growth’ We consider profitability as a prerequisite in addition to environmental and social dimensions in the sustainability scope and allows investments, R&D and competence development. Borregaard's primary response for mitigating the risk of increased transport cost of raw materials and chemicals due to acute physical incidents is to have a business continuity plan with alternative logistic solutions, extra capacity to increase storage volumes and alternative suppliers. At the current stage, the response strategy is monitoring and assessing the risk. If the risk materialises further, mitigatory actions will be implemented. In total,

Borregaard evaluates the timeframe of response to be more than 6 years. 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 of response
500000

Explanation of cost of response
Cost calculation: The risk process including insurance cost and the operation of the logistics will be covered within normal operation for logistics. To respond to the contingency plan we have estimated a management cost. The management cost of handling the contingency plan is estimated to 0,5 FTE which is 500,000 NOK. Total cost of response: 0,5 FTE*NOK 1 mill = NOK 0,5 mill

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity
Products and services

Primary water-related opportunity
Sales of new products/services

Company-specific description & strategy to realize opportunity
Several of Borregaards current and future B2B customers sell products/chemcials towater intensive industries like agriculture, mining and oilfield. In recent years these water intensive industries experience more pressure to improve the sustainability of their operations, driving them to seek sustainable green chemical alternatives for use in their processes. Borregaard consider this an opportunity for our specialised lignin biopolymer products, and a growing market, as these industries get more aware of the water-related risks and look for more sustainable alternatives. Currently there is lacking tailor-made chemical solutions that can compete with established petrochemical additives on cost-performance metric and meet the high volumes that are required in water-intensive processes. At corporate level in Borregaard this opportunity is considered as strategic, because specialisation through innovation and market development with continued emphasis on ESG aspects along the entire value chain, including water-related issues is a priority. The opportunity is currently being realized as an innovation project and will have substantive impact on the business from 2030. The actions being taken to realize the opportunity •Engagement with customers that sells products into water intensive industries •Research projects together with Universities including funding of the activities. Example: Action taken to realize the opportunity In the project LiBan (Lignin-Based Performance Chemicals) Borregaards R&D department, together with different Universities and customers in water intensive industries, will cooperate to find new and more sustainable solutions for water intensive industries like agriculture, water treatment and cleaning. Borregaard was in 2019 granted 19 MNOK from the Norwegian Research council for a 4 year research project to address this challenge. The plan for realization is to finish the research project in 2023. In 2021, work has focused on the first steps of developing new lignin-based performance chemicals for water intensive processes. The project LIBAN aims to directly address the innovation-gap between sustainable and petroleum-based performance additives by understanding: (1) how to modify lignin based biopolymers to produce new diverse structures and functionality, and; (2) how optimize performance in targeted water-intensive applications. In the mid-term future they represent a positive impact on the EBITDA.

Estimated timeframe for realization
More than 6 years

Magnitude of potential financial impact
High

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

Potential financial impact figure (currency)
189000000

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

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

Explanation of financial impact
There is an estimated ramp up in sales volume in a mid-term time perspective- 2030. The ambition of this project is to increase the speciality lignin portfolio by 15.000 metric tons dry solids (MTDS). The volumes will be introduced stepwise and it is estimated to reach the target volume 6 years after the end of the R&D project, earliest in 2030. Introducing new kinds of technology into major industrial sectors is capital intensive and takes time to realize return on investment. Customers are from large industries and take a long time to implement new technology in their processes, but once this technology is implemented, it is used in the process for the long term. At this early stage of the project – before any new modification technology is tested and verified – the additional contribution margin generated from the project is estimated to be NOK 195 mill . These figures are based on previous experience of introduction of specialty products to other markets. As already described, this portfolio is important not only in terms of value creation, but also in terms of allowing Borregaard to compete in segments typically dominated by synthetic polymers. The volume estimates given in the table below are based on estimates from customer contacts. Net sales are based on prices from competitive products, whilst variable cost are based on initial internal estimation. These values need to be further validated as part of the project. Calculation of the potential financial impact figure: 1. Contribution margin: 17 NOK/kg x 15000 MT - 60 mill= NOK 195 mill 2. Increased fixed costs: NOK 6 mill 3. Net financial impact with effect from 2030: NOK 195 mill – NOK 6 mill = NOK 189 mill

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.

Facility reference number
Facility 1

Facility name (optional)
Borregaard Norway

Country/Area & River basin

Norway	Gloma

Latitude
59.277403

Longitude
11.115526

Located in area with water stress
No

Primary power generation source for your electricity generation at this facility
<Not Applicable>

Oil & gas sector business division
<Not Applicable>

Total water withdrawals at this facility (megaliters/year)
54733

Comparison of total withdrawals with previous reporting year
About the same

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes
54196

Withdrawals from brackish surface water/seawater
0

Withdrawals from groundwater - renewable
0

Withdrawals from groundwater - non-renewable
0

Withdrawals from produced/entrained water
442

Withdrawals from third party sources
95

Total water discharges at this facility (megaliters/year)
54561

Comparison of total discharges with previous reporting year
About the same

Discharges to fresh surface water
54435

Discharges to brackish surface water/seawater
0

Discharges to groundwater
0

Discharges to third party destinations
126

Total water consumption at this facility (megaliters/year)
172

Comparison of total consumption with previous reporting year
About the same

Please explain
Withdrawals from fresh surface water is from the river Glomma. The volume of water withdrawal has been at the same level for several years. The third party withdrawal sources' is a municipal supplier, Sarpsborg community and the third party discharge destination is the municipal waste water treatment plant, operated by Sarpsborg community. It is zero volume discharge to brackish surface water/seawater, because the Sarpsborg site has its discharge to the river Glomma, which is 12 km away from the sea. It is sufficient amount of fresh water available from the river Glomma, thus the withdrawal of ground water is zero volume (both reneweable and non-renewable considered). Water consumption is calculated from production volumes times dry matter measurements in the products. Withdrawals, discharges and consumption figures balance. Comparison of total withdrawals/discharges with previous reporting year - treshold: About the same <5%, lower/higher 5-20%, much lower/higher >20% Comparison of total consumption with previous reporting year - treshold: About the same <20%, lower/higher 20-50%, much lower/higher >50%

W5.1a

(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been third party verified?

Water withdrawals – total volumes

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021" Independent third party: Ernst&Young AS (EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. GRI indicator for water withdrawal, data verified: - GRI 303-3 Total water withdrawal, Borregaard Norway (facility 1) Scope: 100% coverage

Please explain
<Not Applicable>

Water withdrawals – volume by source

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021" Independent third party: Ernst&Young AS(EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. GRI indicator for water withdrawal, data verified: - GRI 303-3 Total water withdrawal, source river Glomma (=facility 1 in W5.1) Scope: 100% coverage

Please explain
<Not Applicable>

Water withdrawals – quality by standard water quality parameters

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2020" Independent third party: Ernst&Young AS (EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI standards. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. Scope: 100% coverage

Please explain
<Not Applicable>

Water discharges – total volumes

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2020" Independent third party: Ernst&Young (EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI standard. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. GRI indicator for water discharge, data verified: - GRI 303-4 Total water discharge, Borregaard Norway (facility 1 in W5.1) Scope: 100% coverage.

Please explain
<Not Applicable>

Water discharges – volume by destination

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021" Independent third party: Ernst&Young (EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI standard. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. GRI indicator for water discharge, data verified: - GRI 303-4 Total water discharge, destination river Glomma (facility 1 in W5.1) Scope: 100% coverage.

Please explain
<Not Applicable>

Water discharges – volume by final treatment level

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021" Independent third party: EY (Ernst&Young) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information. - GRI standard. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. Data verified: Water accounting Borregaard Norway (facility 1 in W5.1) . Includes volumes to wastewater treatment facilities. Scope: 100% coverage.

Please explain
<Not Applicable>

Water discharges – quality by standard water quality parameters

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021" Independent third party: Ernst&Young (EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI standard. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. Effluent parameters. Company specific indicators, data verified: COD, BOD, AOX, suspended solids, phosphor, nitrogen, copper (facility 1 in W5.1) Scope: 100% coverage.

Please explain
<Not Applicable>

Water consumption – total volume

% verified
76-100

Verification standard used
Verification report: "Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021" Independent third party: Ernst&Young (EY) Standards: - ISAE 3000. The engagement was conducted in accordance with the International Standard for Assurance Engagements on Assurance Engagements Other than Audits or Reviews of Historical Financial Information - GRI standard. In preparing the Sustainability reporting, Borregaard ASA applied relevant criteria from the Global Reporting Initiative (GRI) sustainability reporting standards, "Core" option. GRI indicator for water consumption, data verified: 303-5 Total water consumption, Borregaard Norway (facility 1 in W5.1) Scope: 100% coverage.

Please explain
<Not Applicable>

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?
Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Description of business dependency on water Description of business impact on water Description of water-related standards for procurement Reference to international standards and widely-recognized water initiatives Company water targets and goals Commitment to align with public policy initiatives, such as the SDGs Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to water stewardship and/or collective action Acknowledgement of the human right to water and sanitation Recognition of environmental linkages, for example, due to climate change	We have selected the Company-wide scope, because Borregaard has a company wide EHS and climate policy, which include the water policy (file attached). The water policy are rooted in the company's business model, corporate culture and values. The aim of the guidelines is to enhance commitment, awareness and continuous improvement in these areas and determine the company's specific procedures and practices. Water has a crucial role in Borregaard's operations, water is a vital resource for transportation, washing and cooling in our industry. Most of our operations are in areas where water is abundant, but water quality is important for the water systems and environment. Borregaard's ambition is to continuously reduce its business impact on the connected water systems and the company will report on water related issues and measures to our stakeholders. For procurement of our main raw material, wood, we have stated in our policy that our water- standard is to source FSC/PEFC forest certificated wood. In 2021, 99% of wood came from certified sources, the target for 2022 is 100% certified wood, thus water-related impact are handled. The policy has reference widely-recognized water initiatives, like the the European water frame directive (WFD). The policy says that targets and goal for water-related risk needs to be identified. Borregaard has identified both short-term and long-term targets for cuts in COD emissions in the discharge effluent to the river Glomma, which is our highest ranged water related risk. Borregaard has prioritized six of the seventeen Sustainable Development Goals (SDGs), which we commit to align to. SDG12, is selected to emphasize the responsibility for reduced impact on water from our direct operations and SDG 2 for sustainable food production, i.e less impact on water. As a signatory of the UN Global Compact's we follow recognized principles in water stewardship. In our business model innovation of new sustainable products is a key and in the policy we commit to consider water-related impact in new innovations into our long-term strategic plans. Recognition of environmental linkages due to climate change is fundamental to our business model, and we support international efforts to mitigate climate change. Borregaard recognise that clean water is of substantial importance for societies. Acknowledgement of the human right to water and sanitation is stated in the company wide Human Right policy (file attached) Borregaard Policy General guidelines for environment climate health and safety engagement july-2021.pdf

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Director on board	The Board of Directors is responsible for the decision of the overall water-related goals at Borregaard in the yearly strategical processes. A water-related decision is a long-term investment plan to reduce the emission of COD to the river Glomma, to improve the ecological status of the river water and to reach the long term target for ecological status in the river Glomma in 2033. Borregaard has identified both short-term and long-term activities for cuts in COD emissions. A steering committee chaired by the Chief Operating Officer of Borregaard's Sarpsborg site (Member of Executive Management Group), reviews the progress at a regular frequency and make investment decisions. The first goal of complying with the requirements in the new water permit from 2019 has been achieved. The next step involves continous reduction implementing improvements for washing and spill collection in the process. Further treatment includes more R&D activities in the field of sustainable water treatment solutions as well as technological improvements that will have a positive effect on emissions of organic matter to water. Borregaard has sent an action plan to the Norwegian Environmental Authorities with estimated cost, effects on COD/emissions and time to implement for each activity.
Chief Operating Officer (COO)	The Chief Operating Officer is responsible for managing and assessing water-related risks and opportunities. He is responsible for the companies main water-related challenge, the emission of organic material, COD to the river Glomma. A water-related decision has been to mitigate the risk by establishing a action plan to the to the Norwegian Environmental Authorities. To implement the plan resources have been dedicated, a task force has been established and a investment plan has been approved. Process owners are responsible for the reduction of COD within their plant. A steering committee chaired by the Plant Director (Member of Executive Management Group), review the progress at a regular frequency, are responsible for development of a long-term plan for cuts in COD. The progress is evaluated as a part of the management review process. The results from 2020 was to continue with action plan for reduction in COD and to identify capex for the long-term reduction plan.
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, and responsible for corporate sustainability activities in the company. The Sustainability Board has the responsibility for assessing the Groups initiatives within sustainability including water related issues and for coordinating this work in the value chain, for presenting progress to the board and for writing Borregaard's Sustainability report. In 2021 several measures has been implemented to strengthen and develop the Groups business model from a sustainable perspective in the whole value chain, both new requirements and criteria for suppliers and the understanding of the sustainability impact of our products in applications that can have impact on improved water quality and water usage. A water-related decision has been increase focus on sustainable communication of the products, life cycle analysis including water usage and water impacts 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. An updated and more thorough scenario analysis and a separate annual TCFD report are example of decisions taken in 2021.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - some meetings	Monitoring implementation and performance Overseeing major capital expenditures Providing employee incentives Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Setting performance objectives	The water-related Key Performance Indicators (KPI's) for the Borregaard Group are reviewed in each Board meeting.The KPI's show the Borregaard's progress against goals and targets for addressing water-related issues. In the yearly meeting, the Board decides the overall water-related goals at Borregaard, and monitors the progress towards the mid-term and long term goals. 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. Strategies, plans, policies and budgets are reviewed in some Board meetings, this also includes water-related issues within these topics.

W6.2d

(W6.2d) Does your organization have at least one board member with competence on water-related issues?

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

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)
Chief Executive Officer (CEO)

Responsibility
Assessing future trends in water demand
Assessing water-related risks and opportunities
Managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues
Quarterly

Please explain
Borregaard's main objective is to develop sustainable product with low environmental footprints, this means that the responsibilities for water-related issues have been assigned to the CEO. President and CEO is responsible for both assessing and managing water-related risks and opportunities, including for assessing future trends in water demand to secure the supply of water and for transportation og goods along rivers. Each member of the group Executive Management is responsible for managing of water-related issues within their respective areas. Our highest rated water related risk , the emission of organic material (COD)from to the river Glomma, is within the responsibility of The Chief Operating Officer (COO) ,reporting to CEO monthly the progress for several operational activities to reduce COD.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	The members of The Group Executive Management have a bonus program, as published in the company's annual report. The bonus elements are linked to the goals of the company and each member has 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 criteria's for nominating employees for the programme. .

W6.4a

(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Role(s) entitled to incentive	Performance indicator	Please explain
Monetary reward	Chief Operating Officer (COO)	Improvements in waste water quality - direct operations	Plant Director of Borregaard's Sarpsborg (COO) site in Norway, member of The Group Executive Management, has a bonus linked to improvements in the waste water quality, in 2021 this bonus program gave around 50.000 NOK. The rational for giving a monetary reward for this is that waste water quality to the river Glomma is the highest rated water related risk. The emission of organic material (COD)from the Borregaard in Norway to the river Glomma, is within his responsibility. The target that released the the monetary reward was that the internal target for the site emission of COD in the waste water to the river Glomma was achieved. The achievements of the COO are measured by a yearly review in which the agreed goal and objectives are addressed. The thresholds for success are: Outstanding performance: Expected bonus level 7-10%, Good Performance - targets achieved: 4-6% and Low performance - targets not achieved: 0+3%. In 2021 this bonus programme frame was about 5-10% of salary and he received 50.000 NOK linked to the COD target asheived in 2021 (57 tons COD tons /day)
Non-monetary reward	No one is entitled to these incentives	<Not Applicable>	All rewards are considered monetary incentives .

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

Yes, trade associations

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

There is a process implemented to make sure that direct and indirect activities are consistent with Borregaards overall water strategy.

Sustainability Board (SB) 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. If inconsistency is detected we will have dialogue with stakeholders to correct the issue. The SB is responsible for writing the yearly Sustainability report, internally the report is used to communicate the latest progress within water-related activities. EHS and Sustainability Manager has the responsibility for the process to collect water-related data at company level. The water volume and emission data are collected from all the company units/production sites. The quality of the data is checked before they are reported. The data is used as input to water-related 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 SB and chairs the Environmental committee of The Federation of Norwegian Industries, and is a member of the CEPI Environmental Committee.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)

Borregaard Annual Report Sustainability Report 2021.pdf

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	11-15	In Borregaards long-term strategic business plan water-related issue is included in achieving long-term business objectives. The water-related issue, emission to water of organic matter, measured as Chemical Oxygen Demand (COD) from the operation at Borregaard in Norway is a main challenge. Monitoring of the river Glomma shows that emission COD influence the ecological status of the river negatively. The objective of the EU Water Framework Directive for this river area (ref: vann-nett.no, ID: 002-3549-R) is to achieve good ecological status before 2033. Our long-term business objectives, is to reduce the emission of COD to the river, to achieve good ecological status in the river before 2033. To achieve the objective we have set reduction target of COD to 30-40% in 2030 (2020). The decision to include COD in our long-term business plan was taken mainly because of regulatory issues, but is an topic of interest of stakeholders like customers and investors. Although Borregaard received a new and stricter water permit which applied from 2019, we expect a stricter permit for emissions to water due to revision of environmental regulations under European Green Deal, which has a zero pollution vision for 2050. Examples of actions taken to integrate COD into the long-term business objective: •Monitor changes in emission regulations under Green Deal •Signed three bilateral multicurrency revolving credit facility agreements linked to objective for reduction of COD
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	11-15	In Borregaards long-term strategic business plan the strategy of achieving the long-term business objectives of reduction in emission of COD to the river Glomma to achieve good ecological status river before 2033, is included. In addition the strategy includes opportunities for our bio-based product within water-intensive industries. The decision to include reduction in COD and opportunities within bio-base products in our long-term business strategy for achieving long-term objectives was supported by the results from conducting climate scenario analyses and application of WWF water risk filter to assessment of water scarcity risk. Improved sustainability, included in water-related issues, is a strategic priority in Borregaard. Reduced emissions to water and market potential for new innovations are long-term value drivers in our strategy. The strategy has affected our priorities within investments and resources at the biorefinery in Sarpsborg, both emission reduction activities and innovation of new sustainable product have been affected. Examples of action taken in the long-term water related strategy: •In 2021 an investment plan for emission reduction was approved and sent to the Norwegian Environmental Authorities. •Dedicated R&D to operate pilot plant to develop measures for emission reduction. • Develop technology for water intensive industry. Our LiBan project addresses development of new green high-performance chemicals.
Financial planning	Yes, water-related issues are integrated	11-15	In Borregaards long-term strategic business plan, the financial planning for water-related issue are included. The decision to include reduction in COD in the financial planning is because the Capex will be a substantive part of the investment budget until >2030. The financial planning has affected our Capex and Opex. Examples of action taken in financial planning of Capex: An investment plan to reduce the emission of COD gradually to Glomma to a level of 30-40 % 2030 (2020) has been approved by The Board of Directors. The plan has been submitted to the Norwegian Environmental Authorities with estimated cost, annually effect on COD and time to implement each activity. Progress in emission of COD is reported to the Board of Directors quarterly. The plan includes investments in improved washing equipment, spill collection, containment, evaporation and incineration. The final goal is good ecological status of the river before 2033. Examples of action taken in financial planning of Opex: •Operating cost for monitoring effect of COD in Glomma: Norwegian Institute for Water Research monitor in accordance with the WFD. • Operating costs of a salmon cultivation facility, commitment to 2032: Emissions of COD has caused a proliferation of bacteria covering riverbed sediments. This causes conditions that has implications for the growth of the wild salmon stock. •Operating cost in the plant due extra COD measures like extra washing that can increase recipe/product cost.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

-1

Anticipated forward trend for CAPEX (+/- % change)

50

Water-related OPEX (+/- % change)

-1

Anticipated forward trend for OPEX (+/- % change)

-1

Please explain

The CAPEX and OPEX data is calculated for Borregaard in Norway. We selected this scope, because this site has 94% of the water withdrawal and 95% of the water discharge of the total in Borregaard. The site has also the major part of emission of COD to the river Glomma. The CAPEX is the investment in emissions to water and other water related activities. The CAPEX was almost the same in 2020 and 2021, due to same activity level, but we have established an investment plan for reduction of emission to water, and the forward trend for the next 5 years is that the CAPEX will increase with 50%. The OPEX was almost the same in 2020 as in 2021, due to same cost for operation of for the water purification plant and the waster water treatment plant, fees for third party water treatment, cost of analysis of emissions to water and the cost of measuring impact on the river Glomma. We expect the OPEX cost to remain unchanged in the next 5 years.

W7.3

(W7.3) Does your organization use scenario analysis to inform its business strategy?

	Use of scenario analysis	Comment
Row 1	Yes	

W7.3a

(W7.3a) Provide details of the scenario analysis, what water-related outcomes were identified, and how they have influenced your organization's business strategy.

	Type of scenario analysis used	Parameters, assumptions, analytical choices	Description of possible water-related outcomes	Influence on business strategy
Row 1	Water-related Climate-related	Our qualitative and quantitative scenario analysis includes Borregaard's most significant risks towards 2030 and 2050.This is in addition to TCFD's recommendations of including scenarios that explore alternatives that will significantly alter the basis for business-as-usual assumptions in a changing environment and society due to the implications of climate change. Short-medium and long-term time-horizons are relevant to assess and analyse our progress and results of the relevant scenarios, In Norway, where most of Borregaards operations are based, key assumptions on climate change is expected to intensify the global hydrological cycle. This may lead to an increase in the intensity and frequency of hydrological extremes, including floods. Events with heavy rainfall will be more intense and occur more frequently. The median projections for Norway indicate an 18 % increase (span: 7 to 23 %) in annual precipitation towards the end of the century, and a doubling of days with heavy precipitation. Due to a combination of political, geographic, and social factors, the US is recognized as more vulnerable to climate change impacts than Norway, ranked 19th out of 181 countries in the 2020 ND-GAIN Index. The US is also more exposed to natural disasters such as coastal flooding, rising sea levels and hurricanes. Preliminary analyses suggest that rainfall intensity for durations of a few hours may increase by more than 30 %. In river systems dominated by snowmelt-floods, a reduction of up to 50 % is expected in spring floods. In river systems that are dominated by rain floods, the magnitude of floods is projected to increase by up to almost 60 %.	In a business as usual or 4°C scenario, water is a key resource with limited availability. Borregaard's scenario analysis has evaluated future events which in turn could impact Borregaard's operations and value chain such as flooding, heavy precipitation, and sea level rise., which in turn could impact Borregaard's operations and value chain. Flooding is an acute risk due to the geographical locations of Borregaard's sites close to rivers and on the dock, and for the company's transportation routes. High-tide floods are already a familiar problem in many cities on the US coasts. Coastal flooding in the US is projected to start in the 2030s, impacting Borregaard's site in Fernandina Beach. Ingoing and outgoing logistics can be highly impacted, in addition to the damage of equipment. Tropical hurricane events also have a high probability of occurrence in Florida. With increased frequency of strong winds and storm surge, it is likely that the site will be closed more often in the coming years, impacting Borregaard's income. For Fernandina Beach, NASA's Sea Level Projection Tool projects a sea level rise to be 0.15 meters in 2030 both for the well-below 2°C scenario and for the 4°C scenario. In 2050 the NASA tool projects the sea level in Fernandina Beach to rise 0.28 meters for the well-below 2°C scenario and 0.32 meters for the 4°C scenario.	The results of the scenario analysis are used in our short- medium and long-term time-horizons and are used for our strategic planning at company level to understand the business risks and opportunities from climate change The scenario analysis shows that precipitation in the Nordic areas in Europe will increase, thus we know that electricity from hydro power will be an increasing resource in the future. Thus, Borregaard have taken the strategic decision to use more electricity in the production in the plan for our SBT 2030 and 2050 targets. We also expect water intense climate change effects such as coastal flooding in the US. Many of Borregaards current and future B2B customers sell products/chemicals into water intensive industries like agriculture and mining. We consider this as an opportunity for our specialised lignin biopolymer products, and a growing market, as our customers get more aware of water scarcity as a probable climate scenario. Our response to this scenario is to innovate lignin biopolymer products that reduces the water consumption and water impact in agricultural and mining industries in those areas.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

Yes

Please explain

At our site at Borregaard in Norway that uses 94% of the water withdrawal an internal price on water is used by your organization. We have different cost of cooling water and process water. Process water 0,97 NOK/m3 Cooling water 0,74 NOK/m3 Compared to the water we are charged from the water treatment plant operated by Sarpsborg community, our own water cost ten times less, thus we strive to use as little as possible from the external water source. The calculation of the water price pr m3 of water is done by taking the actual operating cost for the water treatment plant minus the chemical cost and divide it with the amount of water produced. For 2021that cost was 0,74 NOK/m3 water. This is the cost for the cooling water. Then we add the cost of chemicals for treatment of the process water and divide on the total volume of process water produced, for 2021we obtained 0,97 NOK pr/m3.

W7.5

(W7.5) Do you classify any of your current products and/or services as low water impact?

	Products and/or services classified as low water impact	Definition used to classify low water impact	Primary reason for not classifying any of your current products and/or services as low water impact	Please explain
Row 1	Yes	The European Union's 2008 Classification, Labelling and Packaging Regulation (CLP) incorporates the classification criteria and labelling rules agreed at the UN level, the so-called Globally Harmonised System of Classification and Labelling of Chemicals (GHS). The regulation requires companies to appropriately classify, label and package their substances and mixtures before placing them on the market. It aims to protect workers, consumers and the environment by labelling that reflects a particular chemical's possible hazards. The threshold we use to classify low water impact from the use of our sustainable biochemicals, is no environmental classification due to requirements in the CLP standard. Borregaards main products, Lignin-based biopolymers and speciality cellulose are non-hazardous and thus the classification criteria and labelling rules in the GHS- and CLP-regulation results in no classification, which means their use is associated with low risk. The impact on water quality from Lignin-based biopolymers and speciality cellulose in use from the use of the products are described in chapter 12 in the Safety Data Sheet.	<Not Applicable>	Borregaard products have multiple sustainable features, favourable CO2 footprint, originate from a natural and renewable raw material and can give improved EHS performance in our customers processes, all the aspects are important, including how water quality is impacted from the use of our products. Example: Our wood based lignin-based biopolymers are water-soluble, non-toxic and has a safe to use as dispersant in water soluble systems.

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals Basin specific targets and/or goals	Targets are monitored at the corporate level Goals are monitored at the corporate level	The EHS and climate policy which include the water policy guides the long term goal of Borregaard for these issues. Borregaard's overall EHS and climate objective is that the company and its activities should contribute to sustainable solutions without harm to human health and the environment (including climate). 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. Input on water-related risks comes from using WWF water risk filter, from stakeholder dialogue, from environmental risk assessment of our operations (ISO 14001), from regulatory compliance Borregaard has a strategy period with 3 years horizon (the year the strategy is set is year zero), in the strategy process goals are set. Every year there is an update of the strategy to check if adjustment is necessary. Main targets for next year are updated yearly and approved by the Board during the process of approval of the annual report and Sustainability report. The main water related target are emissions of organic material to the river Glomma, measured as chemical oxygen demand, COD. The approach to set a target for COD for the production site in Sarpsborg is to evaluate the results from the risk assessment process together with the strategy and the evaluation of the target from the last period. It is the Chief Operating Officer in Borregaard that is responsible for the target. The major focus in 2021 has been to reduce the COD below the internal target of 57 tons/day, which is to 2 tons of COD below the emission permit for COD at Borregaard's site in Sarpsborg, Norway (implemented from 2019). Monitoring of COD and other water related emission parameters are done one a daily basis at Borregaards site in Sarpsborg. A monitoring program is established, and the program describes methods for analysing, frequency for sampling, responsibility and response to unnormal results.

W8.1a

(W8.1a) Provide details of your water targets that are monitored at the corporate level, and the progress made.

Target reference number
Target 1

Category of target
Water pollution reduction

Level
Company-wide

Primary motivation
Reduced environmental impact

Description of target
The target was chosen because pollution of organic material (COD) from the operation of our Biorefinery in Sarpsborg has negative impact on the ecological status of the river Glomma. This is mainly a regulatory issue, but is a topic of importance for stakeholders like customers and investors. Although Borregaard in Sarpsborg received a new water permit applied from 2019, we expect a stricter permit due to revision of environmental regulations under the framework European Green Deal - with it's zero pollution vision for 2050 . The rationale for the target is anchored in Borregaards strategy to reduce emissions to water and environmental impact from our operations - thus the impact and emission reductions of COD is monitored at corporate level. The level om ambition for the next 4 years is to reduce the concentration and load of COD gradually to achieve the target, and implement the reduction activities according to the plan we have sent to the Norwegian Environment Authorities.

Quantitative metric
Other, please specify (% reduction in load (ton/day) of pollutants. This is relevant to Borregaard as the permit is given in ton/day and not in concentration for the pollutant Chemical Oxygen Demand (COD).)

Baseline year
2014

Start year
2014

Target year
2025

% of target achieved
64

Please explain
2014 is selected as the baseline year and start year. This was the first full year with operation of the new anaerobic treatment plant at Borregaard in Norway, and a new permit for emission of COD from the Norwegian Environment Authorities was given. In 2014 the emission of COD was 69 ton/day, and in compliance with the new permit. The emission in 2021 was 53 ton/day. The target is to reduce the emission to an average of 43 ton/day in 2025. Calculation of % target achieved in 2021: (69-55/69-43)*100 = 54% The major focus in 2021 has been to continue with our emission reduction plan, the projects with highest impact has been prioritized and a capex plan for the next five years has been approved. Measurements of COD concentration and load in the effluents is done continuously. Measurements of the effect in the river on the ecological status is done 2 times pr year.

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

Goal
Other, please specify (European water frame directive has a target of good ecological status in the river Glomma in 2033.)

Level
Site/facility

Motivation
Reduced environmental impact

Description of goal
Borregaard's biorefinery in Norway generates emissions of organic compound (measured as chemical oxygen demand (COD) or biological oxygen demand (BOD)) to the river Glomma. The effluent discharge of COD has negative impact on the ecological status in the river Glomma. The goal is to achieve good ecological status in river Glomma in 2033, as defined by the European Water frame Directive (WFD), and today the status is classified as poor. The WFD requires all European surface water – lakes, rivers, transitional and coastal water, and groundwater – to reach "good status", thus this is a common goal for Europe. Due to technical and economic reasons the authorities have set the goal to be reach before 2033, for the part of Glomma where we have impact on (ref: vann-nett.no, ID: 002-3549-R). The WDF was taken into the Norwegian (EEA country) from 01.01.2007. Borregaard are considering this more as a goal than a target because it is not known how much the emission of COD needs to be reduced and if its technical and/or economic possible to reach the goal of good ecological status in the river Glomma.

Baseline year
2014

Start year
2014

End year
2033

Progress
2014 is selected as the baseline year and start year. This was the first year with full operation of the new anaerobic treatment plant at Borregaard in Norway, and a new permit for emission of COD from the Norwegian Environment Agency was given. 2033 is selected as end year because this is the goal for achievement of Good Ecological Status (GES) for this river basin according to EU WFD and the Norwegian Environment Authorities. GES is the WFD default goal for all water bodies and is defined as a slight variation from undisturbed conditions. As a requirement in our emission permit (from 2014), the Norwegian Institute for Water Research (NIVA) does yearly monitoring of the river Glomma down streams from Borregaard in accordance with the requirements and standards in the WFD and check the progress towards the long term goal of GES for Glomma. The most recent analysis of the progress show that the conditions in the river has improved which shows that the reductions in emissions COD has had some effect in certain areas of Glomma downstream from Borregaard. The results and progress is reported to the Norwegian Environment Agency yearly. The progress is also reported at company level and are an input to our risk management process. In 2020 this resulted in that an investment plan for further progress was made. The threshold for success is when GES is achieved for all biological and supporting elements measured in the river Glomma according to the method required by WFD.

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?
Yes

W9.1a

(W9.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W1 Current state	W1.2b: - Water withdrawals, total volumes Borregaard ASA - Water discharges, total volumes Borregaard ASA - Water consumption, total volumes Borregaard ASA	ISAE 3000	"Independent accountant's assurance report on Borregaard ASA's Sustainability reporting for 2021." Ernst&Young (EY) has undertaken a limited assurance engagement of the Borregaard ASA's Sustainability reporting for the period from 1 January 2021 to 31 December 2021. SCOPE EY have been engaged by Borregaard ASA to perform a limited assurance engagement, as defined by International Standards on Assurance Engagements to report on Borregaard ASA 's sustainability reporting as the Borregaard ASA have defined and referred to in the Borregaard ASA's GRI Index (see the document GRI Index 2021 on https://www.borregaard.com/sustainability/sustainability-documentation/) (the "Subject Matter") as of31 December 2021 for the period from 01 January 2021 to 31 December 2021. CRITERIA APPLIED BY BORREGAARD ASA In preparing the Subject Matter, Borregaard ASA applied the relevant criteria from the GlobalReporting Initiative (GRI) sustainability reporting standards, "Core" option (the "Criteria"). The Criteria can be accessed at globalreporting.org and are available to the public. Such Criteria were specifically designed for companies and other organizations that want to report their sustainability impacts in a consistent and credible way. As a result, the Subject Matter information may not be suitable for another purpose. EY consider these reporting criteria to be relevant and appropriate to review the sustainability reporting. GRI indicators for water and effluents, data verified: GRI 303-3 Total water withdrawal GRI 303-4 Total water discharge GRI 303-5 Total water consumption

W10. Sign off

W-FI

(W-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.

W10.1

(W10.1) Provide details for the person that has signed off (approved) your CDP water response.

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

W10.2

(W10.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

Yes

SW. Supply chain module

SW0.1

(SW0.1) What is your organization's annual revenue for the reporting period?

	Annual revenue
Row 1	5805000000

SW1.1

(SW1.1) Could any of your facilities reported in W5.1 have an impact on a requesting CDP supply chain member?

Yes, CDP supply chain members buy goods or services from facilities listed in W5.1

SW1.1a

(SW1.1a) Indicate which of the facilities referenced in W5.1 could impact a requesting CDP supply chain member.

Facility reference number

Facility 1

Facility name

Borregaard Norway

Requesting member

Symrise AG

Description of potential impact on member

Comment

SW1.2

(SW1.2) Are you able to provide geolocation data for your facilities?

	Are you able to provide geolocation data for your facilities?	Comment
Row 1	Yes, for all facilities	

SW1.2a

(SW1.2a) Please provide all available geolocation data for your facilities.

Identifier	Latitude	Longitude	Comment
Borregaard UK	53.431999	-2.518186	
Borregaard Czech	49.717969	18.294605	
Borregaard Deutschland	49.04618	8.3127	
Borregaard USA	44.89155	-89.623801	
Lignotech Florida	30.660181	-81.475165	
Borregaard Norway	59.277403	11.115526	

SW2.1

(SW2.1) Please propose any mutually beneficial water-related projects you could collaborate on with specific CDP supply chain members.

SW2.2

(SW2.2) Have any water projects been implemented due to CDP supply chain member engagement?

No

SW3.1

(SW3.1) Provide any available water intensity values for your organization's products or services.

Product name

EuroVanillin Supreme - wood vanillin

Water intensity value

83

Numerator: Water aspect

Water withdrawn

Denominator

Net fresh water used 83 liter/kg product

Comment

https://www.epd-norge.no/kjemikalier/eurovanillin-supreme-wood-vanillin-article3445-333.html Borregaard is the only producer of vanillin from the natural and renewable raw material Norway spruce. Building on six decades of experience Borregaard have developed a wide range of specially adapted varieties of vanillin for different applications. These include food and beverage, flavour and fragrance, personal care and cosmetics, pharmaceuticals, microbiome and plant-based crop protection products

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms