

BORREGAARD'S APPROACH TO EU'S TAXONOMY

2022



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1. ABOUT THE EU TAXONOMY AND THIS REPORT

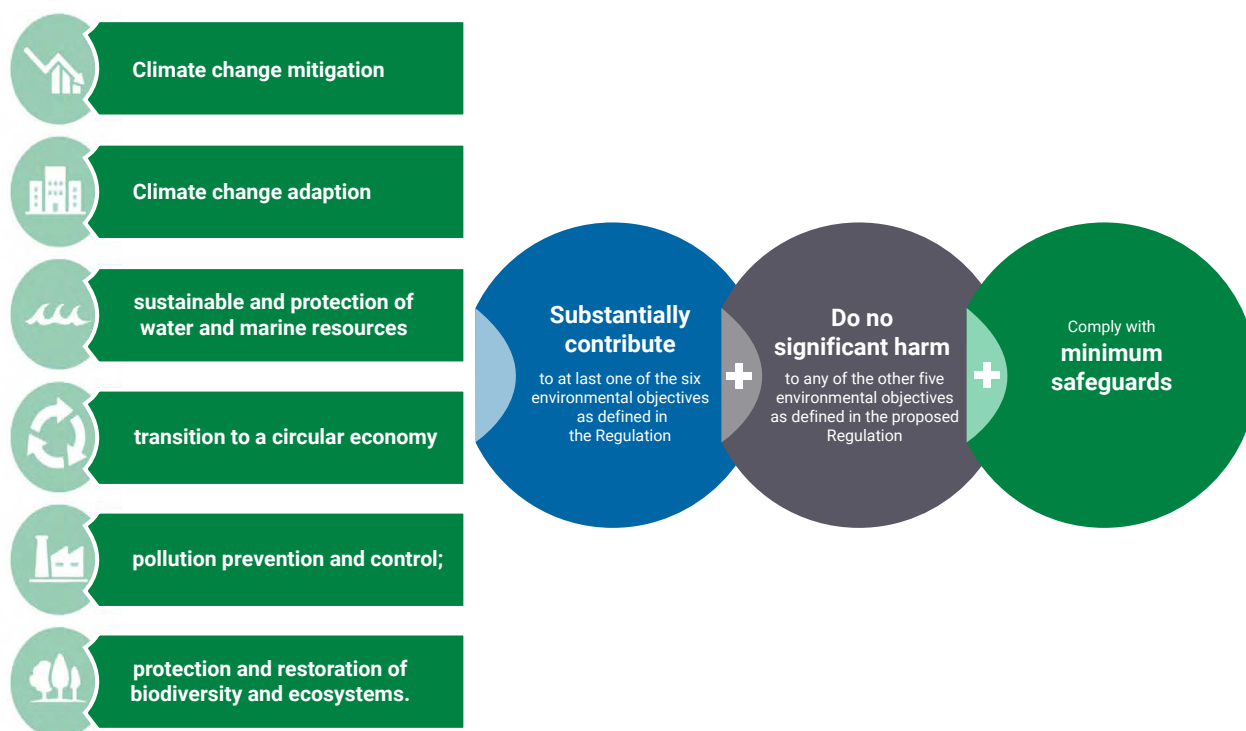
The EU Taxonomy ("Taxonomy") is a classification system establishing a list of environmentally sustainable economic activities. This system can play an important role in scaling up sustainable investments and implement the European Green Deal. The EU taxonomy can provide companies, investors, and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable.

On December 14 2021, the Norwegian Parliament voted to approve the incorporation of the EU Taxonomy into Norwegian Law. However, the Taxonomy requirements will not come into force in Norway until the regulation is incorporated into the EEA Agreement, which has now been postponed to 2023.

In this report, we outline our approach to the Taxonomy and estimate some figures for revenues that will or could be Taxonomy eligible.

2. BORREGAARD'S APPROACH TO THE EU TAXONOMY

The Taxonomy Regulation establishes six environmental objectives (see figure below). Borregaard's economic activities can contribute substantially to three of these.



The processes in Borregaard's biorefinery are integrated in value chains that substantially supports and enables transition to a circular economy, whereas our bio-based products significantly contribute to climate change mitigation. Moreover, the biochemicals we manufacture are in many cases a less polluting substitute for another existing chemical classified as hazardous. Borregaard's activities could therefore be relevant for up to three of the environmental objectives:

- Climate change mitigation
- Transition to a circular economy
- Pollution prevention and control

3. CLIMATE CHANGE MITIGATION

3.1 TAXONOMY ELIGIBILITY AND ALIGNMENT FOR RELEVANT ECONOMIC ACTIVITIES

The business of biorefining intersects with the traditional pulp & paper and chemical sectors. Borregaard thus operates under NACE¹ codes 17.11, 20.13 and 20.14. For the year 2022, the majority of Borregaard's economic activities are not in the scope of the Taxonomy. Several of Borregaard's larger product groups could be covered by the Taxonomy when the circular economy criteria are finished (see below).

Although limited in economic significance to Borregaard, the economic activities *Manufacture of Biogas or Biofuels* and *Manufacture of chlorine* are relevant in the context of Taxonomy reporting for 2022. The Manufacture of Biogas or Biofuels covers the advanced bioethanol produced and sold by Borregaard. The Manufacture of chlorine covers a by-product from the internal supply of an important input factor to Borregaard's biorefinery, namely caustic soda². In total, the sales revenues from these products were approximately NOK 450 million (6.5% of Borregaard total sales revenues) in 2022.

The eligible economic activities in Borregaard are deemed aligned with the Taxonomy for the reporting year 2022, supported by the advanced bioethanol's life-cycle analysis and investments in new energy-efficient electrolyzers based on renewable electricity related to caustic soda.

Innovation of new climate friendly products is an important enabling activity in the Taxonomy's definition of the Manufacturing of low-carbon products. As this activity is not strictly related to a particular NACE code - and perhaps is the economic activity best describing Borregaard's biorefinery concept – we employ its criteria on a set of biochemicals currently produced and sold by Borregaard.

3.2 LOW-CARBON TECHNOLOGIES

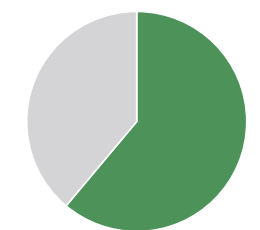
Borregaard's low-carbon emission products from natural renewable raw materials, make a substantial contribution to climate change mitigation. However, when considering new and innovative climate friendly products at Borregaard, these do not necessarily fit well into one existing NACE code, or the established economic activities defined therein. Consequently, these products need proper consideration and recognition perhaps independently of NACE codes in the Taxonomy.

Borregaard's operations may also fall under *Cleantech*, another industry term used to describe low-carbon technologies.

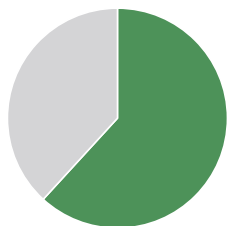
To give a qualitative description of the substitution effect of Borregaard's bio-based products, we have estimated the share of sales revenues that comes from products that replace fossil-based alternatives in the markets we operate in.

¹Statistical classification of economic activities in the European community.

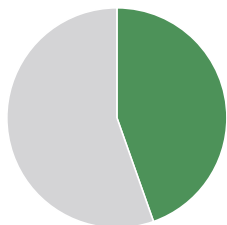
²Caustic soda is both purchased externally and produced internally. When produced in Borregaard, a biproduct of caustic soda, is chlorine. As chlorine is not an input factor to Borregaard, we sell it externally as hydrochloric acid and hypochlorite.



BIOSOLUTION'S REVENUES



BIOMATERIALS' REVENUES



FINE CHEMICALS' REVENUES

● Replacing synthetics ● Does not replace synthetics

3.2.1 BIOSOLUTION

Borregaard's lignin-based biopolymers are renewable, wood-based alternatives to fossil-based chemicals for use in a broad range of industries. A majority of Borregaard's revenues within lignin-based biopolymers come from products that directly replace fossil-based alternatives. These products have low-carbon footprint and can in many cases be considered as low-carbon technologies. Also, Borregaard's biovanillin derived from wood, represents an alternative to oil-based vanillin.

3.2.2 BIOMATERIALS

Speciality cellulose and its derivatives enable production of innovative and environmentally friendly solutions with much less environmental burden compared to the alternatives in markets such as construction, tire cord, plastics and coatings. Cellulose fibrils is a new product group for rheology and stability with several sustainability dimensions, that can replace fossil-based alternatives in most markets.

3.2.3 FINE CHEMICALS

Borregaard's advanced bioethanol is mainly used for biofuel, thus replacing fossil fuel (gasoline).

3.2.4 BORREGAARD GROUP

In total, about 60% (NOK 4.1 billion) of Borregaard's sales revenues in 2022 came from bio-based products with lower climate/environmental footprint compared with fossil-based products.

4. TRANSITION TO A CIRCULAR ECONOMY

In a circular economy, the aim is to make the best possible use of society's resources for as long as possible, simply explained by the 3 R's: Reduce, Reuse and Recycle. This can be done through the high utilisation of raw materials, reducing waste, emissions and the use of energy, as well as by reusing and recycling products. One of the basic principles is eco-design; to design products in a way that ensures that materials can be recovered more efficiently and to view waste as a resource.

High raw materials utilisation, including efficient utilisation of sidestreams and cascading use, are cornerstones of a circular economy. In this context, cascading means that the sidestream from one process is used as feedstock for the next. In this way, we gain more value-added by utilising the raw material for multiple products rather than producing just one product. The value-added and environmental contributions (including climate benefits) in this concept, is higher than utilising the wood for only energy purposes.

4.1 CASCADING USE

Cascading use can both materialise within a cluster of companies and within an integrated production set-up.

In Norwegian forest-based industries, the whole log of wood is utilised for products. Wooden construction material is the main driver for harvesting trees in Norway. The most valuable part of the tree is used for this purpose. One fourth of the wood entering the sawmill becomes residuals in the form of chips to our industry. The remaining part of the tree and the residual wood chips from the sawmills are raw materials for Borregaard's sustainable, high value products.



Borregaard's biorefinery is in itself an extraordinary cascading operation where wood, which consists of fibres, lignin and sugars, is converted into cellulose and a variety of other valuable products. The sidestreams from the cellulose production is first utilised in the production of bioethanol before the rest is converted into lignin-based biopolymers. Parts of the lignin are also used in the production of biovanillin, and parts of the cellulose are converted into cellulose fibrils. Some sidestreams from production are also sold to other industries, which in turn use them as raw materials in their production. Knot pulp, which is removed from the cellulose and utilised for packaging materials and bark for soil conditioning, are examples of such utilisation. The sidestreams that cannot be utilised for products are converted into biogas or biomass used for energy in the production processes.

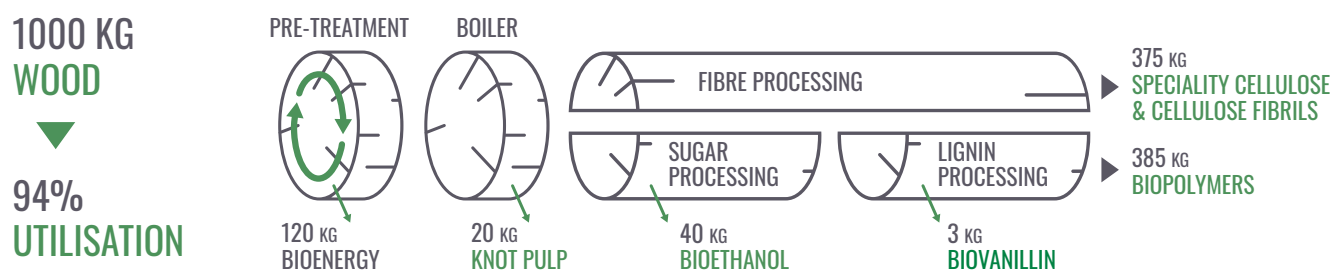
By using sidestreams to produce valuable biochemicals and biomaterials, we secure high resource efficiency of the renewable raw material sourced, which is key to the low-carbon circular bioeconomy.

Borregaard's most important raw material, Norway spruce, is harvested from certified forests. Our focus is on sourcing wood from nearby forests by sustainable transportation, in which health and safety, emissions and costs are considered. In this way, Borregaard, together with external suppliers and customers, is part of a complex and well-established cascading system for bio-based products, intermediate products and sidestreams. In other words, the Norwegian forestry sector and Borregaard's biorefinery are built on the principles of both cascading and circular use.

Borregaard contributes to strengthen circular value chains and promote circularity by offering sustainable solutions. Some of our products are used in sectors that have a high use of resources and where the potential for circularity is high, such as within electronics, batteries, vehicles, packaging, plastics, textiles, construction, food, water and nutrients. We promote circularity by offering sustainable solutions within these areas. Considering that our products are based on a renewable, non-toxic raw material, they represent no negative impact when the end products are recycled.

4.2 HIGH RAW MATERIALS UTILISATION

The concept of utilising all parts of the harvested logs to valuable products, such as building materials in sawmills and our biobased chemicals, contributes to a high raw material utilisation. Borregaard's biorefinery concept also demonstrates high raw material utilisation where 94% of the sourced wood is utilised, of which 82% is turned into commercial products and 12% is used for energy.



85-90% of Borregaard's sales revenues came from the biorefinery concept in 2022.

5. POLLUTION PREVENTION AND CONTROL

Beyond low-carbon products and circularity, the Taxonomy addresses other environmental attributes of products and incentives, for instance, the substitution of substances of concern. As Borregaard's products are inherently non-toxic, we consider the Taxonomy as potentially accelerating the demand for some of our products, for example our cellulose fibrils product, Exilva, and some of our biopolymers going into agriculture.

In certain applications, the products we manufacture are less polluting substitutes for other existing chemicals classified as hazardous. Our biochemicals have comparable, and sometimes better, functionality than the existing hazardous alternatives.

6. DO NO SIGNIFICANT HARM (DNSH) CRITERIA

Based on the initial assessment, Borregaard's biorefinery satisfies the general DNSH criteria for climate change mitigation.

ENVIRONMENTAL TARGETS	ASSESSMENT
Climate Change Adaption	Risk is assessed in Climate Scenario report. The impact of the adaption risk and how it is mitigated is described in the TCFD report for 2022, see Borregaard website (Sustainability documentation).
Sustainable use and protection of water and marine resources	Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving good water status and good ecological potential. The risk identified has been addressed, organic matter (measured as COD) in the water discharge impact the water quality in the River Glomma negatively. A management plan to reduce impact is communicated and sent to the environmental authorities and other relevant stakeholders. The River Glomma is monitored in accordance with the requirements and standards in the EU Water Framework Directive and the data is publicly available.
Transition to a circular economy	No generic DNSH criteria
Pollution, prevention and control (regarding use and presence of chemicals)	<p>Borregaard comply with REACH regulation.</p> <p>Borregaard has procedures to ensure that all new chemicals subject to labelling requirements are assessed for possible substitution by a dedicated committee. The existing portfolio of chemicals is also subject to a periodic substitution review.</p> <p>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 1 July 2019</p>
Protection and restoration of biodiversity and ecosystem	<p>Impact from felling of wood is assessed: In 2022, we bought 98% certified wood, whilst the remaining 2% was controlled in accordance with the PEFC and/or FSC standards. Borregaard's production units outside Norway receive lignin raw material from adjacent pulp mills which source FSC and/or PEFC certified or controlled wood. Borregaard's use of certified wood implies that we do not purchase:</p> <ul style="list-style-type: none"> • Illegally harvested wood • Wood harvested in violation of traditional and human rights • Wood from forests in which high conservation values are threatened by management activities • Wood from forests being converted to plantations or non-forest use; and • Wood from forests in which genetically modified trees are planted <p>The impact of the adaption nature-related risk and how it is mitigated is described in the TNFD report for 2022, see Sustainability documentation - Borregaard.</p>

7. MINIMUM SAFEGUARDS

Borregaard meets the minimum safeguards and the OECD Guidelines on Multinational Enterprises in addition to the ILO convention. Borregaard has joined the UN's Global Compact initiative.