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Environment

Climate impact

The impact
Billerud has both a direct and indirect impact on the climate throughout the value chain. Our mills are energy intensive, but we strive to use our resources as efficiently as possible and have, to a large degree, replaced fossil fuels with biofuels. We work to reduce direct emissions from our own operations as well as indirect emissions from example purchased goods and services. We also enable customers to lower their carbon footprint through our recyclable products made of renewable material.

Billerud is committed to implementing measures within all of our operations and to limiting emissions to air in accordance with operating licenses and environmental regulations. We are also committed to utilizing the best available technology.

Our efforts to mitigate climate change are based on the strong belief that climate and sustainability efforts are crucial for the future success of the company, its employees, customers, other stakeholders, and society in general. We have identified climate impact as one of three focus areas (along with safety first and materials for the future) that are strategically vital for our future competitiveness and already in 2018 we set Science Based Targets, which will be renewed in 2024.

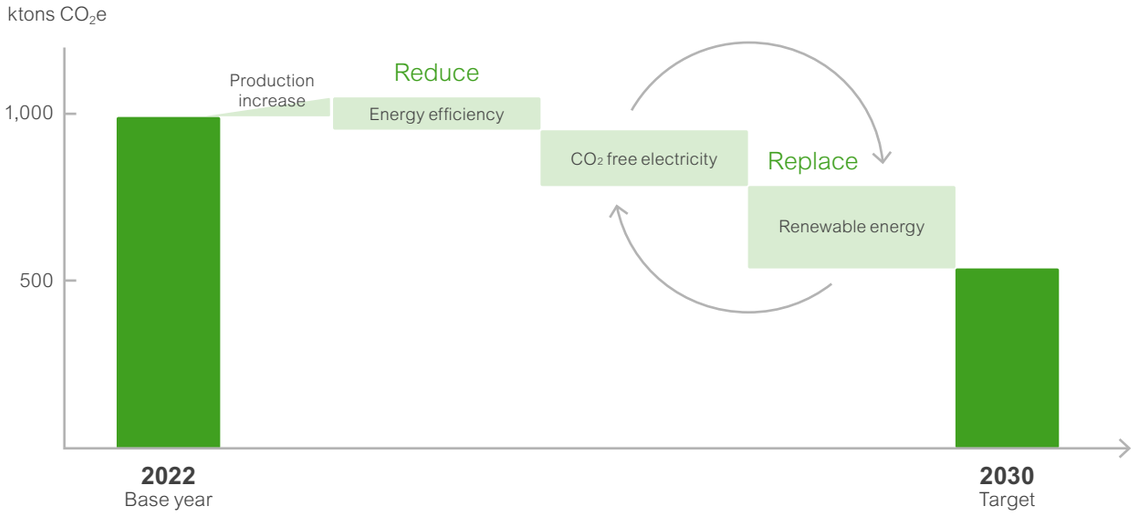
Policies
Our climate efforts are governed by the Group Sustainability Policy. The Billerud Sustainability Policy states that Billerud will strive to minimize its impact on the planet, act responsibly and serve as a role model with respect to environmental considerations. The policy is supplemented by underlying directives, such as the Group Directive Environment that provides more detailed rules on Billerud's environmental work.

Actions
In 2023, we revised our scope 1-3 calculations (also covering year 2022) for Billerud as a whole to cover both Region North America and Region Europe. This change follows our completion of the integration of Verso, a US-based company acquired by Billerud in 2022. Even though Billerud's operations are largely fossil fuel-free, particularly in our European operations, we continue to eliminate the remaining emissions through a number of investments and actions. Our long-term goal is to achieve a carbon footprint at our North American mills that is best in class in North America and as close as possible to the footprint at our European operations.

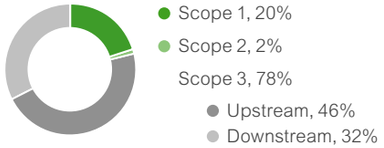
We have updated our greenhouse gas emission reduction targets and we will continue to develop roadmaps with 2022 as the new baseline year. Targets will be submitted to the Science Based Targets initiative (SBTi) during 2024 and are subject to verification by the SBTi. In 2024, we will also set a target of net zero emissions.

Roadmap to reach our scope 1 and 2 by 2030

Europe and North America



Distribution of CO_2e, 2023, %



Scope 1 and 2
Our scope 1 and 2 were revised to address additional areas and we have high ambitions in North America where there is greater potential for energy improvements and decarbonization than in Europe. This includes phasing out coal and tire-derived fuel from North American operations. Efforts are currently underway to substitute fossil fuel with biofuel. The dependence on oil and gas is higher at our North American operations where about 28% of our energy consumption is fossil-fuel based in our mills. Our mills in Europe are 98% fossil-fuel free.

In our efforts to reduce the greenhouse gas emissions related to purchased energy, we purchase CO_2e Emission Free Energy Credits (EFECs) for our North American mills. In 2023, 60% of our purchased electricity was covered by EFECs, which led to a reduction of emissions from fossil fuels.

In 2023, we inaugurated a new recovery boiler at our Frövi mill. The SEK 2.6 billion boiler investment runs entirely on biofuel and will contribute to lowering emissions to air, as well as improving our resource and energy efficiency. The recovery boiler is a vital part of the chemical recovery process carried out at the Frövi mill and extensive training was held for employees during the year.

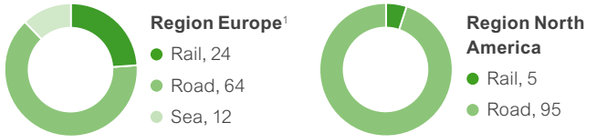
Scope 3
In addition to revising our scope 1 and 2 calculations, we also revised scope 3 to include both North America and Europe. In 2024 we will work to see how we can lower emissions through, for example, working closely with our suppliers, and upstream and downstream transport.

We use renewable and non-renewable chemicals in our manufacturing and during the year we confirmed chemicals as a continued area with a high climate impact. One focus will be to work together with our suppliers to reduce emissions from chemicals by, for example, finding substitutes with lower environmental impact.

Transport is another area of focus, and we actively encourage the transition to a fossil fuel-free fleet by continuing to choose more sustainable modes of transport and monitoring developments in technology and fuel, railway expansion and the electrification of roads. During 2023 we initiated a project to reduce and consolidate terminals and reduce the proportion of vehicle transports in our downstream transports from the European mills.

The majority of Billerud's inbound transports of wood raw material are by road. For outbound transport, Billerud has greater opportunities to steer towards fossil-free alternatives as transport from the mills to our customers is well suited for rail. Our ambition is to decrease the proportion of outbound land transports by road and to increase the proportion by rail. The target is to increse the outbound land transports conducted by rail to 75% by 2030 in Europe. In 2023, 70%[2] (70[2]) of the outgoing land transports from our European mills traveled by rail, so we are well on our way to achieving our 2030 target. Our long-term goal is to have zero greenhouse gas emissions from outgoing transports by 2050.

Transport to production units, 2023, %



Transport from production units, 2023, %

1 Revised calculations with an extended scope
2 Revised calculations regarding sea transport

Carbon capture and collaborations
Billerud completed a feasibility study on a joint venture with the Viken Skog in Follum, Norway, to establish production of bleached chemi-thermomechanical pulp (BCTMP). The project is aligned with the Norwegian government's ambition to increase the country's sustainable industry based on forest and wood resources. The joint venture would secure BCTMP and wood supply for Billerud's board products. The project includes the production of biogas and uses excess heat for district heating.

Together with Viken Skog, Billerud is investigating the possibility to produce high-quality BCTMP with a low carbon footprint. The project opens up an opportunity to implement bioenergy carbon capture and utilization or storage technology (bio-CCUS). The technology can substantially help in the efforts to mitigate climate change. In another bio-CCS project, Billerud is working with Luleå University of Technology in Sweden to investigate ways to store the captured CO_2 in bedrock. If successful, this solution could be applied to several pulp and paper sites with similar geological conditions.

Targets and metrics

Definition	Outcome 2023	Target 2030
Reduction of direct and indirect GHG emissions (scope 1 and scope 2)[1], %	-15	-42
Reduction of indirect GHG emissions (scope 3)[1], %	-13	-25

1 Revised calculations for scope 1-3 with new set baseline 2022 including our operations in Europe and North America. Results refer to market-based methodology for scope 2

Comment on outcome
The outcome for 2023 showed a reduction of emissions in scope 1 and 2, one main reason being decreased fossil fuel usage in North America. The result also showed a reduction of emissions in scope 3, partly due to reduced volumes of materials such as chemicals and pulp. Less business travel and overall less waste generated in operations also had an effect, among other things.

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	Retrospective		
	2022 (base year)	2023	% 2023/2022
Scope 1 GHG emissions			
Gross scope 1 GHG emissions (tCO_2e)	928,263	778,627	-16%
Scope 2 GHG emissions			
Gross location-based scope 2 GHG emissions (tCO_2e)	429,655	389,370	-9%
Gross market-based scope 2 GHG emissions (tCO_2e)	91,118	88,671	-3%
Significant scope 3 GHG emissions			
Total Gross indirect (scope 3) GHG emissions (tCO_2e)	3,458,852	3,006,061	-13%
1 Purchased goods and services	1,371,336	1,127,905	-18%
2 Capital goods	140,000	137,179	-2%
3 Fuel and energy-related activities (not included in scope 1 or scope 2)	206,274	131,262	-36%
4 Upstream transportation and distribution	385,770	363,813	-6%
5 Waste generated in operations	2,393	2,041	-15%
6 Business traveling	1,179	704	-40%
7 Employee commuting	5,300	5,522	4%
8 Upstream leased assets	N/A	N/A	–
9 Downstream transportation	289,050	318,878	10%
10 Processing of sold products	750,272	657,067	-12%
11 Use of sold products	N/A	N/A	–
12 End-of-life treatment of sold products	307,000	261,424	-15%
13 Downstream leased assets	N/A	N/A	–
14 Franchises	N/A	N/A	–
15 Investments	279	266	-5%
Total GHG emissions (tCO_2e)			
Total GHG emissions (location-based) (tCO_2e)	4,816,770	4,174,058	-13%
Total GHG emissions (market-based) (tCO_2e)	4,478,233	3,873,359	-14%

GHG intensity per net revenue	2022	2023	% 2023 / 2022
Total GHG emissions (location-based) per net revenue[1] (tCO_2e/SEKm)	113	101	-10%
Total GHG emissions (market-based) per net revenue[1] (tCO_2e/SEKm)	105	94	-11%

1 See page 142 for financial figure

Biogenic emissions	2022	2023
Biogenic emissions (tCO_2e)	6,939,377	5,834,000

Comments

Revised calculations for scope 1-3 to cover both Region Europe and North America with new baseline 2022.

Billerud follows the standards provided by GHG Protocol (GHG Corporate Accounting and Reporting Standard, the GHG Protocol Scope 2 Guidance and the Corporate Value Chain Scope 3 Accounting and Reporting Standard). We apply the operational control approach, and our scope covers both the parent company and subsidiaries. The emissions include CO_2, N_2O, HFCs PFCs, SF_6 and NF_3. Our scope 2 emissions are reported in accordance with both the location-based and market-based approach.

We use an activity-based methodology for scope 1-2 and a hybrid-based methodology for scope 3, using a variety of activity-based and spend-based data. Spend-based data has been applied to scope 3.2 and partly to scope 3.1. Estimations are made in alignment with the GHG Protocol. No exclusions have been made. We use emission factors in line with global standards, with a majority originating from DEFRA, EPA and Ecoinvent. No calculation tool was used.

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EU Taxonomy disclosure

The European Union has introduced the EU taxonomy as part of the action plan on financing sustainable growth. For 2023, Billerud is required to report on taxonomy alignment for the two overarching environmental objectives *Climate change mitigation, Climate change adaptation,* and eligibility for the four environmental objectives *Sustainable use and protection of water and marine resources, Transition to a circular economy, Pollution prevention and control,* and *Protection and restoration of biodiversity and ecosystems*.

Identifying and assessing taxonomy eligible activities
Relevant economic activities for Billerud have been assessed based on the Taxonomy Directive (EU 2020/852) and related delegated acts, hereafter "the taxonomy". Billerud's main economic activities, production of paper and board, are not included in the current version of the taxonomy.

The threshold used for assessing relevant economic activities is that it generates external revenue, net sales in the consolidated income statement. Internal consumption that does not generate external revenues has not been included in the taxonomy eligible environmental economic activities. Economic activities related to the latter listed five objectives have not been deemed relevant due to the fact that they don't generate external revenues, operating expenses, or investments. The assessment identified four relevant economic activities described below.

A yearly analysis is made with the relevant departments within Billerud to make sure that the activities fulfil the requirements for alignment, both regarding significant contribution and principles regarding Do No Significant Harm. Compliance with Minimum Safeguards are supported by Billerud steering documents, including the Code of Conduct, Supplier Code of Conduct, Group Sustainability Policy, Group Health and Safety Policy, and Group Environmental Directive. Billerud has not been convicted in any legal cases related to human rights, corruption, taxation, or unfair competition during the year.

Accounting policy – denominator
Total turnover for the Group equals net sales (Note 2) in the consolidated income statement according to IFRS.

Total Capex, in accordance with the taxonomy definition, are investments in tangible and intangible assets in the consolidated statement of cash flows and through business combinations and new and modified leasing contracts in Note 13 Right of Use Assets.

Total Opex, in accordance with the taxonomy definition, consists of the following items:

- Short term and low value leases according to Note 13, Right of Use Assets.
- Maintenance and Repair of Property, Plant and Equipment accounted for as other external costs in the consolidated income statement.

Forest management
The economic activity described in the taxonomy focuses mainly on forest owners. Only a small fraction of Billerud's wood supply comes from fully owned forests. However, for a share of the wood supply, Billerud has been engaged in and had some influence and insight over the forest management practices related to Bergvik Skog Öst's forests. The external revenues from this part of the wood supply are also deemed relevant from a taxonomy perspective. The main support for this conclusion is practice of the forestry plans.

The external turnover includes sale of wood to sawmills and other forestry companies, and forestry services from Bergvik Skog Öst forests and fully owned forests. The external revenues that are included as taxonomy aligned is a non-complex transaction and there is no risk for double counting.

No Opex and Capex relating to the taxonomy definition of forest management have been identified.

Cogeneration of heat/cool and power from bioenergy and production of heat/cool using waste heat
Billerud's production units produce large amounts of steam and electricity. At our production unit in Gävle there is a joint arrangement with Bomhus Energi AB, which supplies district heating to external parties and our production unit in Gävle.

External turnover include 50% of total net sales of Bomhus Energi AB, accounted for as net sales in the consolidated income statement. Opex is related to maintenance and repair in Bomhus Energi AB, of which 50% are included in the consolidated income statement as Other external costs.

Capex is related to capital expenditures in Bomhus Energi AB, of which 50% are included in Note 11 Property, Plant and Equipment on the row Investments.

Bomhus Energy AB is a standalone company and there is no risk of double counting. There are no closely related activities that are included in this taxonomy reporting.

Freight rail transport
Billerud's fully owned subsidiary, ScandFibre Logistics AB, operates freight rail transports for its own and other forestry industry companies' outbound transports. ScandFibre Logistics AB operates under the Rail 22 standard, which is assessed to be in line with the alignment requirements.

External turnover in ScandFibre Logistics AB, related to freight rail transport is included in the net sales in the consolidated income statement.

Opex is the proportion of short-term leases of railway carriages and repair of them, in relation to the external turnover and total turnover in ScandFibre Logistics AB. Opex is accounted for as Other external costs in the consolidated income statement.

Capex is the new leasing contracts during 2023, and is included in Note 13, Right of Use Assets.

ScandFibre Logistics AB is a standalone company and there is no risk of double counting. There are no closely related activities that are included in this taxonomy reporting.

Acquisition and ownership of buildings
Billerud has office leases accounted for as Use of Right Assets in Note 12, that is taxonomy eligible. Billerud activates investments in owned buildings in the fixed assets register. No evaluation if they are taxonomy environmentally sustainable activities (aligned) has been made.

Nuclear and fossil gas related activities

	Nuclear energy related activities	
1	The undertaking carries out, funds or has exposures to research, development, demonstration and deployment of innovative electricity generation facilities that produce energy from nuclear processes with minimal waste from the fuel cycle.	NO
2	The undertaking carries out, funds or has exposures to construction and safe operation of new nuclear installations to produce electricity or process heat, including for the purposes of district heating or industrial processes such as hydrogen production, as well as their safety upgrades, using best available technologies.	NO
3	The undertaking carries out, funds or has exposures to safe operation of existing nuclear installations that produce electricity or process heat, including for the purposes of district heating or industrial processes such as hydrogen production from nuclear energy, as well as their safety upgrades.	NO
	Fossil gas related activities	
4	The undertaking carries out, funds or has exposures to construction or operation of electricity generation facilities that produce electricity using fossil gaseous fuels.	NO
5	The undertaking carries out, funds or has exposures to construction, refurbishment, and operation of combined heat/cool and power generation facilities using fossil gaseous fuels.	NO
6	The undertaking carries out, funds or has exposures to construction, refurbishment and operation of heat generation facilities that produce heat/cool using fossil gaseous fuels.	NO

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Taxonomy – Turnover

Proportion of turnover from products or services associated with taxonomy-aligned economic activities – disclosure covering year 2023

Financial year 2023		2023		Substantial contribution criteria						DNSH criteria (Does Not Significantly Harm)									
Economic Activities (1)	Code (2)	Turnover (3) SEKm	Proportion of Turnover, year 2023 (4) %	Climate Change Mitigation (5) Y; N; N/EL	Climate Change Adaptation (6) Y; N; N/EL	Water (7) Y; N; N/EL	Pollution(8) Y; N; N/EL	Circular Economy (9) Y; N; N/EL	Biodiversity (10) Y; N; N/EL	Climate Change Mitigation(11) Y/N	Climate Change Adaptation (12) Y/N	Water (13) Y/N	Pollution (14) Y/N	Circular Economy (15) Y/N	Biodiversity (16) Y/N	Minimum Safeguards (17) Y/N	Proportion of Taxonomy-aligned (A.1.) or -eligible (A.2.) turnover, year 2022 (18) %	Category enabling activity (19) E	Category transitional activity (20) T
A. TAXONOMY-ELIGIBLE ACTIVITIES																			
A.1 Environmentally sustainable activities (taxonomy-aligned)																			
Forest management	CCM 1.3	433	1.0%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	Y	Y	Y	Y	Y	0.9%		
Cogeneration of heat/cool and power from bioenergy	CCM 4.20	177	0.4%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	Y	Y	-	Y	Y	0.4%		
Production of heat/cool using waste heat	CCM 4.25	22	0.1%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	-	Y	Y	Y	Y	0.0%		
Freight rail transport	CCM 6.2	438	1.1%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	-	Y	Y	-	Y	1.1%		
Turnover of environmentally sustainable activities (taxonomy-aligned) (A.1)		**1,070**	**2.6%**	**2%**	**0%**	**0%**	**0%**	**0%**	**0%**	**-**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**2.4%**		
Of which enabling			%	%						-	-	-	-	-	-	-	%		
Of which transitional			%	%						-	-	-	-	-	-	-	%		
A.2 Taxonomy-eligible but not environmentally sustainable activities (not taxonomy-aligned activities)																			
				EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL										
Turnover of taxonomy- eligible but not environmentally sustainable activities (not taxonomy-aligned activities) (A.2)		**-**	**0,0%**	0	0	0	0	0	0								0.0%		
A. Turnover of taxonomy-eligible activities (A.1+A.2)		**1,070**	**2,6%**	%	%	%	%	%	%								2.4%		
B. TAXONOMY-NON-ELIGIBLE ACTIVITIES																			
Turnover of taxonomy- non-eligible activities		40,154	97.4%																
TOTAL		**41,224**	**100%**																

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Taxonomy – Capex

Proportion of Capex from products or services associated with taxonomy-aligned economic activities – disclosure covering year 2023

Financial year 2023		2023		Substantial contribution criteria						DNSH criteria (Does Not Significantly Harm)									
Economic Activities (1)	Code (2)	Capex (3) SEKm	Proportion of CapEx, year 2023 (4) %	Climate Change Mitigation (5) Y; N; N/EL	Climate Change Adaptation (6) Y; N; N/EL	Water (7) Y; N; N/EL	Pollution(8) Y; N; N/EL	Circular Economy (9) Y; N; N/EL	Biodiversity (10) Y; N; N/EL	Climate Change Mitigation(11) Y/N	Climate Change Adaptation (12) Y/N	Water (13) Y/N	Pollution (14) Y/N	Circular Economy (15) Y/N	Biodiversity (16) Y/N	Minimum Safeguards (17) Y/N	Proportion of Taxonomy-aligned (A.1.) or -eligible (A.2.) Capex, year 2022 (18) %	Category enabling activity (19) E	Category transitional activity (20) T
A. TAXONOMY-ELIGIBLE ACTIVITIES																			
A.1 Environmentally sustainable activities (taxonomy-aligned)																			
Forest management	CCM 1.3	0	0.0%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	Y	Y	Y	Y	Y	0.0%		
Cogeneration of heat/cool and power from bioenergy	CCM 4.20	4	0.1%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	Y	Y	-	Y	Y	0.0%		
Production of heat/cool using waste heat	CCM 4.25	0	0.0%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	-	Y	Y	Y	Y	0.0%		
Freight rail transport	CCM 6.2	1	0.0%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	-	Y	Y	-	Y	0.0%		
Capex of environmentally sustainable activities (taxonomy-aligned) (A.1)		**5**	**0.1%**	**0.1%**	**0%**	**0%**	**0%**	**0%**	**0%**	**-**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**0.0%**		
Of which enabling			%	%						-	-	-	-	-	-	-	%		
Of which transitional			%	%						-	-	-	-	-	-	-	%		
A.2 Taxonomy-eligible but not environmentally sustainable activities (not taxonomy-aligned activities)																			
				EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL										
Acquisition and ownership of buildings	CCM 7.7	610	18.1%	%	%	%	%	%	%								2.1%		
Capex of taxonomy- eligible but not environmentally sustainable activities (not taxonomy-aligned activities) (A.2)		610	18.1%	%	%	%	%	%	%								2.1%		
A. Capex of taxonomy-eligible activities (A.1+A.2)		615	18.2%	%	%	%	%	%	%								2.1%		

B. TAXONOMY-NON-ELIGIBLE ACTIVITIES

Capex of taxonomy- non-eligible activities	2,763	81.8%
TOTAL	**3,378**	**100%**

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Taxonomy – Opex

Proportion of Opex from products or services associated with taxonomy-aligned economic activities – disclosure covering year 2023

Financial year 2023		2023		Substantial contribution criteria						DNSH criteria (Does Not Significantly Harm)									
Economic Activities (1)	Code (2)	Opex (3) SEKm	Proportion of OpEx, year 2023 (4) %	Climate Change Mitigation (5) Y; N; N/EL	Climate Change Adaptation (6) Y; N; N/EL	Water (7) Y; N; N/EL	Pollution(8) Y; N; N/EL	Circular Economy (9) Y; N; N/EL	Biodiversity (10) Y; N; N/EL	Climate Change Mitigation(11) Y/N	Climate Change Adaptation (12) Y/N	Water (13) Y/N	Pollution (14) Y/N	Circular Economy (15) Y/N	Biodiversity (16) Y/N	Minimum Safeguards (17) Y/N	Proportion of Taxonomy-aligned (A.1.) or -eligible (A.2.) Opex, year 2022 (18) %	Category enabling activity (19) E	Category transitional activity (20) T
A. TAXONOMY-ELIGIBLE ACTIVITIES																			
A.1 Environmentally sustainable activities (taxonomy-aligned)																			
Forest management	CCM 1.3	0	0.0%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	Y	Y	Y	Y	Y	0.0%		
Cogeneration of heat/cool and power from bioenergy	CCM 4.20	0	0.0%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	Y	Y	-	Y	Y	0.0%		
Production of heat/cool using waste heat	CCM 4.25	16	0.7%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	-	Y	Y	Y	Y	0.9%		
Freight rail transport	CCM 6.2	130	5.9%	Y	N/EL	N/EL	N/EL	N/EL	N/EL	-	Y	-	Y	Y	-	Y	6.2%		
Opex of environmentally sustainable activities (taxonomy-aligned) (A.1)		**146**	**6.6%**	**6.6%**	**0%**	**0%**	**0%**	**0%**	**0%**	**-**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**7.1%**		
Of which enabling			%	%						-	-	-	-	-	-	-	%		
Of which transitional			%	%						-	-	-	-	-	-	-	%		
A.2 Taxonomy-eligible but not environmentally sustainable activities (not taxonomy-aligned activities)																			
				EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL	EL;N/EL										
Opex of taxonomy- eligible but not environmentally sustainable activities (not taxonomy-aligned activities) (A.2)		**-**	**0.0%**	%	%	%	%	%	%								0.0%		
A. Opex of taxonomy-eligible activities (A.1+A.2)		**146**	**6.6%**	%	%	%	%	%	%								7.1%		
B. TAXONOMY-NON-ELIGIBLE ACTIVITIES																			
Opex of taxonomy- non-eligible activities		2,060	93.4%																
TOTAL		**2,206**	**100%**																

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Climate-related information in accordance with TCFD

Background
The Task Force on Climate-related Financial Disclosures (TCFD) is an initiative under which companies can voluntarily opt to report on how climate risks and opportunities may affect future profitability. By analyzing and reporting in line with TCFD's recommendations, Billerud gets a better understanding of how the company is affected by climate-related events, both in terms of risks and opportunities.

This analysis then forms the basis for strategic considerations and is also an important part of increasing transparency to make it easier for investors and other stakeholders to make informed decisions and a fair assessment of Billerud's long-term opportunities for profitable growth.

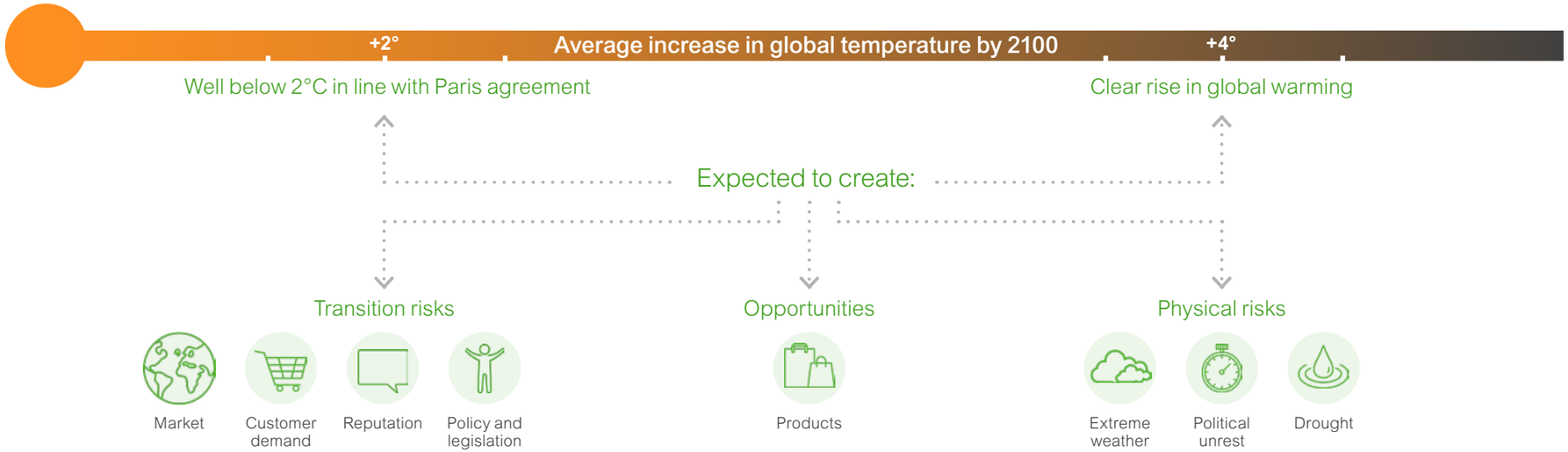
Climate is a subject of high priority in Billerud, both from the perspective of how we as a company have an impact on the climate, as well as from the perspective of how the climate affects us in terms of risks and opportunities.

Many of these risks are driven by macro trends such as climate change, political developments, changing market demand and stricter sustainability requirements from both legislators and other stakeholders. Recent years' rapid contextual changes regarding climate-related issues, in combination with internal changes as well as the acquisition and integration of the US-based company Verso into the Billerud Group, place increased demands on the understanding and management of climate-related risks and opportunities.

Billerud's analysis of climate-related risks and opportunities is based on the Paris Agreement to keep the temperature increase well below two degrees and the IPCCs four-degree scenario (RCP 8.5) which is based on "business as usual".

A supplementary assessment of both physical risks and transition risks as well as opportunities is available in Billerud´s response to CDP (www.cdp.net).

The assessment was conducted by leading representatives for the business following the recommendations of the TCFD. The result after assessing the financial effects of risks and opportunities linked to these two scenarios, shows that the climate-related opportunities exceed the climate-related risks in both scenarios. This is due to an increased market



	Transition risks		Opportunities		Physical risks	
Risks and opportunities	• Changing customer behaviors • Stigmatization of sector	• Increased costs for raw material • New technical solutions	• Increased demand for sustainable products • Carbon capture	• Increased collection and recycling of products • Optimized production efficiency	• Disruptions in the supply chain • Rising temperatures leading to disturbed harvests	• Increased risks for fire or flooding
Financial impact	• Increased operational costs	• Reduced sales	• Increased sales and results	• Reduced operational costs	• Increased operational costs	• Reduced sales
Potential preventive action	• Actively communicate the benefits of our sector	• Establish new ways of working	• Clear focus on new business	• Industry cooperation on recycling	• Geographical purchasing strategy	• Preventive actions installed to secure production

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potential in both scenarios. In the well below two degrees scenario, the transitional risks as a result of policy measures and changed market behavior are somewhat higher, while the four-degree scenario is considered to result in more significant exposure to physical climate-related risks due to a higher degree of climate change.

Material opportunities
Increased focus on climate-related issues can lead to increased demand for bio-based products. This opportunity can materialize as a result of political measures, increased awareness among consumers and changed preferences on the market in general. To meet the growing demand for sustainable packaging solutions, Billerud is working in close collaboration with customers and partners to develop innovative solutions that can capture new market potential.

Demand for carbon capture and storage (CCS) and carbon capture and usage (CCU) is believed to increase rapidly in the next few years as states and companies are set to meet their climate targets. Through Bio-CCS and Bio-CCU our industry has a significant business opportunity to develop new business based on helping other actors achieve their climate targets. Billerud is now investigating this opportunity in more depth.

Increased focus on production efficiency will result in reduced greenhouse gas emissions and lower costs.

Material risks
Transition risks are generally expected to occur before physical risks.

Wood and pulp account for around a third of Billerud's operating costs. A price increase in this segment therefore constitutes a significant risk. The climate-related aspects that affect this risk are both transitional risks and physical risks. The growing interest in the forest as a resource for energy, materials and carbon storage is a transitional risk that drives increased demand and potentially higher prices for wood raw materials. Physical risks as a result of climate change, such as increased pest infections and increased frequency of droughts and forest fires, can affect availability and thus the price of the wood raw material.

In order to reduce the risk associated with the supply and price of wood raw material, the European Wood Supply unit focuses on optimizing the value chain and building long-term relationships with suppliers. We also increasingly take on climate adaption measures to reduce physical climate risks in forest areas managed by Billerud, for example through cooperating with contractors to minimize rutting damages due to changes in soil condition and to utilize site adapted forestry management to increase long-term pest resiliency.

When the climate is changing with increased temperatures and increased frequency of severe weather events, operational interruptions due to physical climate effects on our production units constitute a significant climate-related risk. Our operations may be subject to flooding, water shortages or other disturbances. If a production unit is shut down due to weather events, it may affect Billerud's sales volume. Preventive actions to reduce the risk of such scenarios have high focus in all parts of Billerud.

Governance
Climate-related risks and opportunities in Billerud are governed on a strategic level by the Board of Directors and on an operational level by the CEO, Group Management Team and EVP Sustainability & Public Affairs. The Board of Directors continuously manages climate-related risks, opportunities and impacts as part of the work with strategic issues concerning operations, investments and acquisitions. Climate-related issues are also a recurring agenda item at the company's board meetings. For example, the Board of Directors annually reviews the Group Sustainability Policy (including climate issues) and monitors progress linked to the company's targets for energy efficiency and fossil-free production.

The CEO is responsible for the ongoing overall operational management of Billerud's business operations in accordance with instructions and regulations established by the Board. This includes the ultimate operational responsibility for climate-related issues. The Sustainability and Public Affairs function is responsible for all climate-related issues such as analyses, follow-up and reporting as well as monitoring global developments, trends and regulations linked to climate issues.

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Resource efficient production

The production processes for pulp, paper, and paperboard are energy intensive and Billerud's mills have a direct impact on the environment through greenhouse gas emissions and emissions to air, water effluents and waste generation. We also consume energy and raw materials such as cellulose fibers and chemicals in our processes and they have an indirect impact on the environment through their production and transportation. We have an indirect impact on the environment through the emissions from transportation of our products. We strive for continuous improvement, running efficient operations while minimizing our negative environmental impact on the communities and the environment.

We work towards minimizing our negative environmental impact through investments in new technologies and systematically working with continuous improvements. In Europe, representatives from each mill collaborate through energy and environment networks related to compliance, coordination and knowledge sharing. These networks are comprised of engineers and environmental and energy managers from the mills who meet regularly to share insights and issue monthly reports. In addition to the networks, we initiated monthly meetings between environmental and energy managers in North America and Europe during 2023.

Policies, certifications and regulations

Our work to address the environment and energy use is governed by the Group Sustainability Policy. The policy is supplemented by underlying directives, such as the Group Directive Energy and Group Directive Environment that provide more detailed rules on Billerud's sustainability work. Billerud's Sustainability Policy states that Billerud will strive to minimize its impact on the planet, act responsibly and serve as a role model with respect to environmental considerations.

We mitigate environmental risks in our operations by following a third-party certified environmental management system which provides structured working methods to comply with official requirements and legislations. Our mills in Sweden are both ISO 14001 and ISO 50001 certified. The Pietarsaari and Quinnesec mills are ISO 14001 certified. We also intend to certify the Escanaba and the Wisconsin Rapids facilities in the future.

All our production units are regulated by permits. Production permits issued by governmental authorities define the specific environmental conditions for compliance and are monitored by regulatory agencies. We strive for continual improvement and lowering our emissions to the environment. Each production unit is legally responsible for ensuring compliance with environmental laws and regulations and to monitor environmental performance.

Our Swedish mills comply with the EU legislation with decided Best Available Technology-Associated Emission Level (BAT-AEL), corresponding to mills with BAT. These BAT-AELs are updated regularly as permissible emission levels become stricter. Billerud reports the outcome to the authorities annually. Our North American mills comply with the Environmental Protection Agency (EPA); Environment, Great Lakes, and Energy (EGLE); Wisconsin Department of Natural Resources; and local environmental regulations through waste regulations, air and water permits.

Energy

The impact

Our production processes are energy intensive and while we generate much of our own electricity needs internally, we are also affected by the geopolitical situation and a volatile energy market. The supply and cost of electricity and gas in Europe improved in 2023 compared to 2022 due to mild, rainy and windy weather, and a general industry slowdown resulting in lower demand for energy. We do however, in the long-term, face a global challenge as the need to replace and extend the existing energy grid with renewable energy increases.

In Europe, all electricity that is produced internally or purchased is covered by Guarantees of Origin (GoOs), and in the US we purchased Emission-Free Energy Certificates (EFECs) corresponding to 60% of the total purchased volume in 2023. About 38% of our electricity needs were generated in-house at our European operations, while the rest was purchased from the grid. In our North American operations, up to 69% of our electricity consumption was self-generated in 2023. For purchased steam and district heat in Pietarsaari, Billerud also purchases GoOs to ensure that the steam and district heat is produced from fossil free fuels.

Use of fuel, 2023, %

Region Europe
- Self-generated biofuels, 85
- Purchased biofuels, 13
- Purchased fossil fuels, 2

Region North America
- Self-generated biofuels, 67
- Purchased biofuels, 5
- Purchased fossil fuels, 28

Actions

Each year we invest in projects and maintenance that increase our energy efficiency. Our new recovery boiler in Frövi uses 100% fossil-free biofuel and will contribute to, among other benefits, lower emissions to air, improved energy efficiency, and greater flexibility in production.

During the year, a new, more efficient evaporator was installed at our Gruvön mill that will further optimize the overall steam usage at the mill, resulting in reduced greenhouse gas emissions.

We have increased our efforts to supply our surplus energy to the district heating networks close to our mills in Sweden. In 2024, our mill in Gävle, which is connected to the local district heating network, will also be connected to the district heating network in the town Sandviken through a 20 kilometer district heating line.

During 2023, the Quinnesec mill had a third party (Clean Tech Partners) conduct an energy assessment audit that offered many ways to reduce energy usage, and impact steam and water usage in a positive way. Seven energy savings projects were conducted during the year and more are being developed for 2024. The completed projects are expected to contribute to a reduction in steam demand for 2024. By reducing its package boiler run time in the winter by 50%, the mill also reduced its consumption of natural gas.

Quinnesec has become part of the voltus program, whereby the plant can be called upon to reduce or shift its electricity use in response to overly high grid stress, for example during a heatwave. Being a part of the program generates a profit for the mill, while also allowing the mill to be part of the solution should a short-term energy shortage arise.

At Escanaba, our most energy intensive mill, we have started the journey towards using more biofuels and reducing the North American mill's dependency on fossil fuels. The Escanaba mill completed the installation of two new heat exchangers which will capture waste heat from the process sewer and reuse it in the production process. This will reduce the amount of steam used, resulting in lower greenhouse gas emissions.

Pollution

The impact

We aim to keep pollution and our negative impact on the local environment and community to a minimum. Our mill operations are regulated through production permits in line with local legislation. Unexpected disturbances in the production process could give rise to noise, odors or enhanced emissions to air and water that affect the areas surrounding the mills. Transports to and from the mills, in addition to our employees traveling to and from work, also affects the environment. Billerud strives to make a positive impact on the communities in which we operate and by offering a range of channels/forums we aim to pursue a constant dialogue with local communities and residents.

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Actions
In 2023, we undertook a number of activities to mitigate the impact of pollution from our mills. At our mill in Karlsborg, we replaced washing equipment in 2022 which, in 2023, resulted in a lower load of water and organic oxygen-demanding matter to the external treatment plant. Plans are underway at the Karlsborg mill for a significant dredging of the wastewater treatment plant in 2024 that will keep the treatment plant running efficiently to reduce emissions to the recipient. The new recovery boiler at the Frövi mill will have a major impact on the neighboring community by reducing dust and SO_2 emissions as well as reducing odors.

Since Billerud's acquisition of the Quinnesec and Escanaba mills in North America, efforts have been underway to reduce the amount of sulphur emissions to air at the mills. This has resulted in a reduction in odor which has had a positive impact on the local community.

The installation of two new heat exchangers at the mill in Escanaba, which will capture waste heat from the process sewer, will reduce water usage during the summer months when supply is often lower. During the summer months, the wastewater is diluted by water from the nearby lake to reduce the temperature in the wastewater treatment plant to maintain the microorganisms in the biotreatment sector. By putting the waste heat back into the process, the process sewer effluent temperature will be decreased eliminating the practice of overflowing the reservoir.

Water and effluents
The impact
We are committed to minimizing the impact of our water use and our impact on water quality. Surface water is mainly withdrawn for our production processes and returned to waterways. Sedimentation basins, biological treatment and chemical treatment, are among the techniques we use to eliminate contaminants from the wastewater before it is returned to the waterways. Billerud's production units are all located close to waterways so we can utilize the surface water without exerting a significant impact on the flow of the water. Apart from the surface water there is a minor usage of groundwater and, in some instances, municipal water. In 2023, the total outcome was 0.2% and 0.1% respectively.

There is no significant water consumption in the pulp and paper manufacturing process. We withdraw the water mainly to wash pulp in several stages at the mill through digesting, washing, bleaching and dilution of the fiber flow to the paper and board machines. Water is reused several times throughout the process before going back to the effluent. Water is also withdrawn to be used as a coolant in heat exchangers because of its excellent heat transfer properties. The cooling water is uncontaminated and therefore safe to return to the waterway without any further treatment/purification. 2-5% of the water that is withdrawn is not released back to the source. This is primarily attributable to evaporation and the retained water content of our finished products.

According to our water risk assessment, none of our production units are in an area rated as "High" or "Extremely High". One production unit is in an area rated "Medium-High" and the others in areas rated "Low" or "Low-Medium". During specific weather events our production units risk experiencing a water restriction, which could lead to a negative impact on production. For the purpose of this reporting, we have applied the WRI's Aqueduct Global Water Tool (https://www.wri.org/aqueduct).

In Sweden, production permits and related environmental conditions are subject to the EU Water Directive, including principles on non-deterioration. Production permits are granted based on environmental impact assessments that include the status of habitats and ecosystems as well as consultation with local communities and other stakeholders. The environmental conditions of the permits specify emission levels to water that are monitored through control programs.

Actions
All Swedish production units are members of a local water management association where, together with affected stakeholders including supervisory authorities, we collaborate on issues relating to the recipient's status, such as monitoring and management. In 2023, a water conservation team at the Quinnesec mill focused on changing behaviors regarding water usage, for example, ensuring tanks are not overflowing, increasing operator rounds during startups to catch open valves, and shutting off hoses. The team will continue to meet in the future to implement further ways to reduce water usage.

All of our mills measure and track their wastewater flow with the aim to set up local goals for water usage. This process has begun in Sweden, with the ambition for 2030 to have significantly reduced our water usage by reducing the wastewater flow to the water treatment plant by 10%. We have also set a short-term goal for a 1% reduction by the end of 2024. This will result in a positive impact on the function of the treatment plant, with potential to further reduce emissions of organic matters and nutrients. Over the coming years we plan to review and integrate our Finnish and North American mills in these ambitions.

Water discharge
The reported water discharge is process wastewater. This is purified at on-site treatment plants and then returned to the recipient. The total water intake is also reported, including wastewater, cooling water and consumed water. Water discharge from non-production units, for example, sales offices, is considered insignificant. There was no water discharge in areas with water stress as stated in GRI 303-1. The most significant substances reported as emissions to water are: Chemical Oxygen Demand (COD) or Total Organic Carbon (TOC), Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Organically Bound Chlorine (AOX), Total-Nitrogen (N) and Total-Phosphorous (P).

Water withdrawal
We report on our water withdrawal for surface water, municipal water and groundwater. Our water withdrawal is 100% freshwater. No data collection and reporting method has been established for produced water. According to an assessment performed in 2016, 2-3% of the total used water comes from wood fiber, external produced pulp and chemicals. There is no water withdrawal from areas with water stress as stated in GRI 303-1. Water usage is reported by each production unit based on a measurement and/or calculation according to established control programs. Water extraction from non-production units, for example, sales offices, is considered insignificant.

Chemicals
The impact
Billerud is committed to protecting the environment and public health. We strive to minimize the consumption of chemicals in our production, substitute high environmental impact chemicals, and reinforce demands on chemical suppliers to provide safer alternatives. We closely monitor and optimize the use of chemicals, such as in the bleaching process, where we are currently identifying which chemicals have the greatest environmental impact. We also conduct research to investigate new chemicals and opportunities to recycle and reuse certain chemicals and phase out chemicals for reasons such as changes in legal or health and safety requirements.

Actions
In 2023, we engaged in a number of activities to minimize the use of chemicals in our operations. For example, we reduced and permanently suspended anthraquinone (AQ) in Escanaba, a digester additive that increases the positive yield of pulp resulting in a reduction of chemicals used for bleaching and consequently reducing process costs. The Escanaba mill also reduced its use of coagulant in refined mechanical pulp (RMP) by half in 2023.

We work continuously with our suppliers to find alternative chemicals with a lower emissions to reduce the hazardous effect on health and the environment. For example, we favor chemicals that have been produced with renewable energy and only choose suppliers who can provide us with sufficient information on any hazardous substances, such as carcinogenic, mutagenic, and reprotoxic (CMR) chemicals in their products.

Billerud participates in several industry forums and collaborates within the industry and with our suppliers regarding chemical usage and alternative solutions. For example, Billerud is a member of Normpack, a collaboration within the packaging industry to increase the safety of materials that come into contact with food. This forum also addresses legislation, the phasing out of certain chemicals, and finding alternatives.

Reuse and waste
The impact
The production of pulp, paper, and paperboard requires raw materials such as wood, chemicals, and energy. Billerud strives to utilize these resources in the most efficient way possible. We aim for circularity in our products and in our production processes. For example, most of our energy comes from the fiber residues in our manufacturing process, whereby the cellulose fibers in the digester process are extracted using cooking liquor containing inactive chemicals as well as fiber residues. When incinerating the concentrated cooking liquor in the recovery boiler we recover and reuse the chemicals as well.

Actions

There are many examples of how we work with waste and waste recovery on an ongoing basis. In the production process, the significant material flow of waste and waste recovery can be described as follows:

- Bark from wood logs is used in solid biofuel boilers for energy production.
- In the recovery process the cooking chemicals are recycled and energy is recovered from wood residues.
- Turpentine is a by-product from the pulping process, and we supply it to other industries.
- Soap is another by-product that can be traded to an external manufacturer or processed into crude tall oil within the mills. Crude tall oil can be used as an energy source internally or traded to biorefineries that, for example, produce renewable fuels and biobased chemicals.
- Paper and paperboard material waste is dissolved and returned to the production process. The paper and paperboard production also provides residues from coating chemicals that can be used as cover material for landfills after external processing.
- Fiber and bio sludges are separated from the wastewater and are either incinerated for energy recovery or used for soil improvement.

In 2023 we purchased new equipment at our mill in Skärblacka to handle sludge from our treatment plant. The equipment enhances the dryness which provides opportunities to deliver the material externally where it can be used for soil improvement. The dryer sludge also leads to better energy recovery if incinerated.

We conducted trials in 2023 to convert the organic biosludge recovered from our treatment plants in Skärblacka and Rockhammar to biochar, which can be used as biofuel within our mills. Biochar can also be used to replace fertilizer to improve soil or used as an absorbent for water treatment or metal recycling.

Our Quinnesec mill uses over 90% of its wastewater treatment plant residues in an outreach program that benefits the local farms in the community by reducing the need for fertilizer. At the same time, this has resulted in a reduction in the amount of waste going to landfill. The Escanaba mill uses approximately 80% of its wastewater treatment plant residues for similar schemes in the community.

Significant amounts of waste generation to landfill at the production units are green liquor dregs from the chemical recycling processes and ashes from the solid biofuel boilers. The most significant source of hazardous waste are the oil residues from, for example, oil separators. All waste (including hazardous waste) that is not managed at the production site is sent to approved external waste management firms. Approval is also required for all hazardous waste transporters. Waste generation and waste management at the production sites are included in the annual environmental reporting provided to the supervisory authorities. Billerud reports the waste data categorized as process waste to landfill or hazardous waste. Waste data is reported in dry tons, except for hazardous waste. Waste data is measured through our own weighting or invoicing data.

Targets and metrics

Definition	Outcome 2023	Target 2023
Region Europe		
Energy consumption, MWh/ton product	5.6	5.1
Emissions of fossil CO_2 in the manufacturing process, kg/ton product	28.1	27
Region North America		
Energy consumption, MWh/ton product	8.0	7.4
Emissions of fossil CO_2 in the manufacturing process, kg/ton product	491	410

Comment on outcome

Energy consumption per ton product increased both in Region Europe and Region North America in 2023 due to market-related curtailments, to 5.6 (5.3) respectively 8.0 (7.5). The annual targets were thus not met. Emissions of fossil CO_2 per ton product in Region Europe and Region North America also increased in 2023 to 28.1 (27.7) respectively 491 (459), due to production events and because of market-related curtailments, and thus the annual targets were not reached.

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	2022			2023		
Energy consumption and mix[1]	**Billerud total**	**Region Europe**	**Region North America**	**Billerud total**	**Region Europe**	**Region North America**
(1) Fuel consumption from coal and coal products (MWh)	46,545	0	46,545	3,513	0	3,513
(2) Fuel consumption from crude oil and petroleum products (MWh)	361,730	328,362	33,368	357,014	305,364	51,650
(3) Fuel consumption from natural gas (MWh)	2,450,816	0	2,450,816	2,025,528	0	2,025,528
(4) Fuel consumption from other fossil sources (MWh)	135,836	0	135,836	0	0	0
(5) Consumption of purchased or acquired electricity, heat, steam, and cooling from fossil sources (MWh)	1,131,009	0	1,131,009	845,844	3,995	841,849
(6) Total fossil energy consumption[2] (MWh)	**4,125,935**	**328,362**	**3,797,573**	**3,231,899**	**309,359**	**2,922,540**
Share of fossil sources in total energy consumption (%)	**16.9%**	**2.1%**	**44.8%**	**13.8%**	**2.0%**	**38.7%**
(7) Consumption from nuclear sources[3] (MWh)	**1,974,629**	**1,874,629**	**100,000**	**3,381,478**	**3,214,284**	**167,194**
Share of consumption from nuclear sources in total energy consumption (%)	**8.1%**	**11.8%**	**1.2%**	**14.5%**	**20.4%**	**2.2%**
(8) Internal biofuel (MWh)	18,110,173	12,327,561	5,782,611	17,114,457	12,090,920	5,023,537
(9) Purchased biofuels (MWh)	2,740,801	1,984,275	756,526	2,279,438	1,886,486	392,952
(10) Purchased steam and district heat from renewable resources including biomass (MWh)	223,581	223,581	0	206,753	206,753	0
(11) Sold energy i.e. secondary and primary (MWh)	924,845	924,845	0	1,010,672	1,010,672	0
(12) Biofuel used for electricity production and sold energy (MWh)	4,169,844	2,212,802	1,957,042	2,911,082	1,966,090	944,991
(13) Internally generated electricity (MWh)	2,259,865	1,400,617	859,248	1,916,818	1,218,812	698,006
(14) Internally generated electricity with bio GoO electricity[4] (MWh)	1,259,687	1,259,687	0	33,193	33,193	0
(15) Fuel consumption on site, brutto (MWh)	23,845,900	14,640,198	9,205,702	21,783,131	14,285,951	7,497,180
(16) Net fuel consumption5 (MWh)	19,676,056	12,427,396	7,248,659	18,872,049	12,319,860	6,552,189
Share of renewable sources in total energy consumption (%)	**75.0%**	**86.2%**	**54.0%**	**71.7%**	**77.7%**	**59.1%**
Share of fossil free sources in total energy consumption (%)	**83.1%**	**97.9%**	**55.2%**	**86.2%**	**98.0%**	**61.3%**
Total energy consumption (MWh)	**24,405,891**	**15,926,222**	**8,479,668**	**23,335,322**	**15,774,091**	**7,561,232**

1 The table presents energy use for Region Europe and Region North America. Onsite, Billerud uses mostly bioenergy in our boilers and a small amount of fossil fuels. We also purchase electricity from the grid as well as produce electricity in our back pressure facilities. In Region Europe some waste heat is sold as district heat and primary heat
2 Total fossil energy consumption shows all fossil fuels used in boilers and lime kiln
3 At the time of writing not all bio GoOs have been sold due to update delays in the Swedish Energy Authorities trading platform. If all bio GoOs are not sold in Region Europe the amount of internally used bio GoOs will increase. Region Europe's electricity is fossil free
4 Internally generated electricity is not included in the total due to that the GoOs are sold
5 Net fuel consumption is the total fuel used in the boilers and lime kiln onsite, including purchased electricity, subtracting biofuels used for electricity production

Energy intensity per net revenue	2022	2023	% 2023 / 2022
Total energy consumption from activities in high climate impact sectors per net revenue from activities in high climate impact sectors[1] (MWh/SEKm)	573	566	-1.2%

1 See page 142 for financial figure

	Year 2023
Non-renewable energy production (MWh)	3 231 899
Renewable energy production (MWh)	18 551 232

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	2023			2022			2021	2020
	Billerud total	Region Europe	Region North America	Billerud total[1]	Region Europe	Region North America[1]	Billerud total[7]	Billerud total[7]
Production								
Board, paper and pulp, ktons	3,604	2,816	788	3,831[1]	3,017	814[1]	3,129	3,047
Materials used								
Wood, thousand m^3 sub	13,193	9,835	3,358	15,660[1]	9,959	5,701[1]	10,100	10,351
Pulp, purchased externally, ktons	326	301	24	372[1]	334	38[1]	375	300
Pulp, purchased internally, ktons	124	96	28	182[1]	129	53[1]	148	160
Chemicals (renewable)[2], ktons	85.4	67.1	18.3	95.9[1,2]	72.9	23.0[1,2]	74.3	74.1
Total renewable materials[2], ktons	**13,728**	**10,299**	**3,429**	16,310[1,2]	10,495	5,815[1,2]	**10,697**	**10,885**
Chemicals (non-renewable)[2], ktons	643	411	232	735[1,2]	452	283[1,2]	407	420
Total materials used[2], ktons	**14,371**	**10,710**	**3,660**	17,044[1,2]	10,946	6,098[1,2]	**11,105**	**11,306**
Air emissions								
Sulphur (S), tons	467	347	120	666[1]	352	314[1]	276	371
of which diffuse sources, tons	156	156	0.05	217[1]	217	0[1]	166	277
Nitrogen oxides (NO_x), tons	4,878	2,749	2,129	4,672[1]	2,833	1,839[1]	2,891	3,050
Dust, tons	717	523	195	771[1]	569	202[1]	509	604
Water withdrawal								
Surface water, million m^3	251	176	76	241[1]	183	59[1]	186	190
Groundwater, million m^3	0.40	0.00	0.40	0.97[1]	0.00	0.97[1]	0.00	0.00
Municipal water, million m^3	0.26	0.26	0.00	0.27[1]	0.27	0.00[1]	0.31	0.40
Total water withdrawal, million m^3	**252**	**176**	**76**	**243**[1]	**183**	**60**[1]	**187**	**191**
Emissions to water								
Process water[3], million m^3	195	125	70	185[1]	131	54[1]	135	141
COD (chemical oxygen demand)[4,5], tons	28,150	28,150	–	28,544[1,4]	28,544[4]	–[1]	29,065[4]	28,249
TSS (total suspended solids), tons	4,154	3,154	1,001	5,066[1]	4,095	971[1]	3,830	3,078
BOD (biochemical oxygen demand)[5], tons	486	–	486	660[1]	–	660[1]	–	–
Organically bound chlorine (AOX), tons	301	129	172	288[1]	128	160[1]	131	146
Nitrogen (N), tons	431	394	37	452[1]	433	19[1]	446	454
Phosphorus (P), tons	74	43	30	81[1]	53	28[1]	49	47
Waste								
Process waste, tons	178,506	67,837	110,669	151,418[1]	66,773	84,645[1]	61,503	90,292
Hazardous waste[6], tons	925	924	0.36	967[1]	966	1[1]	1,803	1,201

1 Region North American have reported from the date of the acquisition (1 of April 2022) to the end of the year 2022
2 Reported amount of chemicals revised for Region North America 2022
3 Cooling water not included
4 Revised data (COD) for Europe 2022 and 2021 (Frövi 2021 and 2022, Pietarsaari 2022)
5 In Region North America BOD is regulated in production permits while in Region Europe the corresponding compounds is regulated as emissions of COD
6 Different definitions of hazardous waste in Region North America and Region Europe
7 Before the acquisition of Verso

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Materials for the future

The impact
We are committed to producing recyclable, reusable or compostable paper and board with a low carbon footprint. We are also committed to a packaging and paper future where sustainability goes hand in hand with our commitment to high quality and performance. Our product development work is focused on an approach that supports the circular economy, low climate impact initiatives and high product safety. All new materials that Billerud develops should be more sustainable than what is currently available and have a positive impact on the entire value chain.

Billerud products are well aligned with the new circular economy action plan that is a part of the European Green Deal. As part of the European Green Deal, the European Commission proposed a regulation on packaging and packaging waste that aims to increase recycling and reuse and reduce waste. Through our continuous sustainability efforts over many years, we remain a step ahead in our materials development, putting Billerud in a strong position among customers and other stakeholders. At the same time, ever stricter rules mean that Billerud faces a constant challenge to remain prepared and able to meet future legislation that affects our industry.

Policies, certifications and regulations
Our work with materials is governed by the Group Sustainability Policy. The policy is supplemented by underlying directives, such as the Group Directive Environment that provides more detailed rules regarding Billerud's sustainability work. We continuously update our policies and directives in line with current rules and regulations.

Demands on materials and articles intended for direct or indirect contact with food are high and managing product safety is thus fundamental for Billerud. Billerud's approach to product safety is governed by the Operations, Quality and Procurement policy. The product safety group, which comprises representatives of all the production units, ensures that regulations, legislation and other requirements are met. The technical customer support functions are responsible for registering grievances and complaints about products and other product-related management, which may apply to the company's product liability.

Billerud's products comply with the European Framework Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food. Since there is currently no harmonized legislation on paper and board within the EU, Billerud follows the German legislation by applying the BfR recommendations. The American FDA legislation is also applied outside the EU. In addition, certain products comply with other demands, such as the Chinese standards on materials in contact with food. Some grades are designed to fulfill medical standards for paper material. This ensures that Billerud's products are safe under intended conditions of use. Our European mills are FSSC 22000 certified. Region North America has initiated the certification process for both Food Safety and Quality.

In 2023, no breaches of legislation or voluntary codes of practice occurred regarding health and safety, product information and labeling or market communication. No fines related to product responsibility were imposed.

Actions
Recyclability
After mapping of our product portfolio in Europe, we have determined that all our European packaging materials are recyclable according to the external PTS recyclability method. We plan to undertake a full review of the recyclability of our North American products over the coming years.

Product development
Billerud has a common innovation process for all materials to ensure transparency in projects and innovations, and that we are fulfilling all the necessary criteria to meet the sustainability requirements. We aim for high-performance materials that are as resource efficient as possible, enabling customers to use less material in their packaging and reduce their carbon footprint. For example, in one of Billerud's 2023 launches we improved the coating concept to enable a carbon footprint reduction compared to the coating in an existing product.

We have prioritized research related to the development of advanced barriers to replace the current plastic-based barriers. Our research focused primarily on barriers for liquid packaging board and kraft paper. A challenge is to develop a recyclable barrier that can solve packaging issues relating to handling, moisture, light and oxygen. We have already made strides in this area with our Recyclable Flow Wrap, a barrier coated paper that replaces plastic film for flow wrap applications for improved circularity and lower greenhouse gas emissions. Barrier development is a continued key priority in the future.

In collaboration with RISE Research Institutes of Sweden, our BoxLab has developed a valuable tool for the industry that calculates the long-term performance of corrugated board packaging. The tool can predict the critical stacking strength of a corrugated package for longer times and in high humidity. The tool is part of our True Performance concept where we take time, climate and load into consideration when determining a material's true performance. This can enable customers to reduce their packaging material consumption, resulting in lower cost and a lower carbon footprint.

Billerud and RISE are also working together to create a durable fiber bag that is lightweight yet reusable (up to about 50 times based on our own tests). Improving the reusability of paper products would eventually replace the need for plastic bags. Another project with RISE focuses on enabling circular and biobased packaging with the goal to develop business modules and technical solutions that enable circular approaches along the value chain. For this project, Billerud has been contributing with knowledge, experience and our renewable materials.

Alliances
Billerud works through collaborations to solve the future challenges facing the industry such as increasing the recyclability of packaging products. The company is a member of Treesearch, a Sweden-based collaboration platform on new materials from the forest. Our dialogues with decision-makers often take place in coordination with industry associations such as the Swedish Forest Industries Federation or Confederation of European Paper Industries (CEPI) and Alliance for Beverage Cartons and the Environment (ACE).

CEPI has started a project called 4evergreen, which seeks to optimize the circularity of fiber-based packaging. 4Evergreen launched part one of the Recyclability Evaluation Protocol for standard recycling mills, which is a new European method that can be applied in the paper industry to evaluate packaging's recyclability. Billerud is also part of a working group that is doing testing on complex packaging. The results are used for preparing guidelines on technical and practical recycling, collecting and sorting for de-inking and specialized recycling mills. Billerud works on similar issues within the EU also through our involvement in EXTR:ACT, a European platform to increase the recycling of beverage cartons and similar fiber-based multi-material packaging.

Billerud recently started to work in the European CEN standardization working group TC 261/SC4/WG3 with the target to prepare two packaging standards: Definitions and principles for design-for-recycling of packaging; and Process and criteria to evaluate the recyclability of packaging.

EPDs and LCAs
To support its environmental claims, Billerud commissioned independent research institutes such as RISE to conduct life cycle assessments on our products. These assessments, which took place from 2016-2022, take into consideration the entire product life cycle, from raw material production to the disposal or recycling of the finished packaging.

During 2023, we worked to produce environmental product declarations (EPDs) for our products produced in Region Europe and can now provide EPDs for many of these products. With an EPD, customers can compare a product's performance from an environmental perspective through the product life cycle. Customers can also use our product EPDs to calculate the environmental impact of their finished packaging, use the values for their scope 3 calculations, or compare our data with a competitor's paper product. All our data is verified by an independent third party, approved by the International EPD System.

Targets and metrics

Definition	Outcome 2023	Target 2023
Proportion of Billerud's packaging paper that is certified recyclable[1], %	100	100
Proportion of production units certified in line with food safety standards[1], %	100	100

1 Target and outcome apply to the European operations

Comment on outcome
100% of our European packaging paper is certified recyclable. This means that we reached our target for 2023, which was 100%. 100% (100) of our production units in Region Europe are certified in line with food safety standards, reaching our goal of 100% for 2023.

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Sustainable wood supply

The impact
Renewable raw materials from the forest are our most important resources. Sustainable forestry, whereby the social and biological assets of forests are preserved, is necessary to ensure a wood supply for years to come.

We source our wood fiber from responsibly managed forests. Billerud does not source from high conservation value forests, illegally harvested wood sources, conflict areas, genetically modified forests, forest land converted to other land use, or where human rights are violated. We reduce our risk by sourcing wood fiber from low-risk countries. The wood is sourced as close to our mills as possible, which reduces the transportation impact. Harvesting is carried out in accordance with applicable laws and regulations and whenever Billerud fells a tree, we use it as effectively and intelligently as possible. Those parts of the trunk that have the broadest diameter and highest quality are delivered to the sawmill, while the thinner parts are sent to our paper and board production facilities. Bark and other byproducts are used as fuel in the company's mills.

Policies and certificatios
In addition to the Billerud Code of Conduct, there are several Group policies and directives that govern our work. Our directives are related to, and aligned with, the Operations, Quality and Procurement Policy; the Responsible Business Policy; and the Sustainability Policy. National laws and regulations for forestry set the minimum standard for Billerud. We are third-party certified to chain of custody standards set by the Forest Stewardship Council® (FSC®)[1], Programme for the Endorsement of Forest Certification (PEFC)[2], and in North America, the Sustainable Forestry Initiative (SFI®). Billerud's due diligence system ensures that all purchases follow the procedures set out by FSC® Controlled Wood, Controlled Sources in PEFC Chain of Custody, and comply with the EUTR and US Lacey Act timber legislations.

97.9% of our wood suppliers in Europe (with a purchase value over a certain threshold) signed Billerud's Supplier Code of Conduct. In North America, where we initiated the process of signing the Supplier Code of Conduct in 2023, the corresponding figure was 42.2%.

Actions
Around 74% of our wood fiber in Europe was sourced from Swedish forests, with the rest coming mainly from Norway, Finland and the Baltic countries. In our North American operations, 96% of the wood supply came from the area surrounding our mills, namely Michigan and Wisconsin, and a small proportion, 4%, came from Canada.

[1] FSC-C004906, FSC-C020000, FSC-C108771, FSC-C108782, FSC-C014984, FSC-C023846

[2] PEFC/05-33-114, PEFC/05-23-68, PEFC/05-31-78, PEFC/05-33-136, PEFC/05-33-135, PEFC/05-33-137, PEFC/29-31-92

In total, Billerud purchased 13.6 (15) million cubic meters of wood fiber in 2023, of which 10.8 (11.5) million cubic meters was for our European operations and approximately 2.8 (3.5) million cubic meters was for our operations in North America. We continued to work closely with our highly valued wood suppliers but purchased less material compared to previous years due to the general market slowdown in 2023 and higher inventories among our customers. These higher inventories relate partly to overstocking in the post-pandemic period.

Ensuring a stable wood supply
Billerud has long-term sourcing partnership contracts and close collaboration with forestry companies, forest owners and sawmills, which enables us to meet the demands for a continuous supply of sustainable, cost-efficient wood fiber and ensure sustainable forestry.

Of Billerud's fiber volume in the Swedish mills in 2023, around 78% was supplied by approximately 90 sawmills, forest owner associations and large forest companies, and based on supply agreements. Around 22% of this fiber volume was harvested in Sweden by our own forestry management organization on the lands of small, private forest owners and the Bergvik Skog Öst forest holding.

Some of the small forest owners have chosen to certify their forests through membership in Billerud's group certification which includes PEFC and FSC® certification. This group currently consists of 258 (223) members and covers a total managed productive forest area of approximately 108,000 (104,400) hectares of forest land.

Bergvik Skog Öst comprises 360,000 hectares in central Sweden. Our forestry management efforts, which will end in 2024, include all harvesting, forestry measures, and practical issues related to this forest holding. We have a long-term agreement to purchase 1 million cubic meters of wood annually from Bergvik Skog Öst.

We do not conduct forest land management in our North American operations, where about half of our wood fiber purchases are made on the open market and half is purchased through long-term contracts with suppliers. All of Billerud's fiber volume in North America is supplied by 275 sawmills, independent logging companies, and large industrial forest owners, based on supply agreements.

Sustainable sourcing
Billerud has procedures and guidelines to avoid purchasing raw material from illegal felling operations, from forests with high conservation values, from regions with serious social conflicts, and where felling leads to deforestation.

For the forests that we manage in Sweden, we monitor operational indicators for biodiversity and strive to continuously enhance landowner awareness. In 2023, we offered forest owners training on harvesting methods in line with the objectives for Continuous Cover Forestry. This is an approach to sustainable forestry whereby forest stands are maintained in a permanently irregular structure that is created and sustained through the selection and harvesting of individual trees. We also raised awareness and held training on Closer to Nature Forestry, a concept proposed in the EU Forest Strategy for 2030, with the aim of improving the conservation values in European forest management.

Fiber origin[1], 2023, %

Region Europe
- Sweden, 74.3
- Norway, 9.8
- Finland, 7.6
- Baltic region, 7.0
- Other[2], 1.3

Region North America
- USA, 96
- Canada, 4

1 Including market pulp
2 Brazil, Uruguay and Canada

All Billerud wood suppliers in North America receive mandatory training in best management practices for water quality, biodiversity and occupational health and safety. The suppliers are required to continue this education annually to maintain their certification as a Qualified Logging Professional.

Protecting biodiversity
As part of our forest management efforts in Europe we take measures to protect valuable habitats so that naturally occurring plants and animals can continue to live in the forest. These measures include the following:

- When felling, all the dead trees are left, and high stumps are created to protect and resupply dead wood in the forest, which insects, fungi and small animals need in order to survive.
- Clearing and thinning operations are planned to provide more room for remaining trees to grow.
- To protect the ecology around watercourses and other sensitive biotopes, "buffer zones" are created and retained where necessary.
- Deciduous trees are encouraged, which assists animals and other wildlife, and can also help forests withstand storms better, for example.
- Individual endangered species are protected. For example, we are working with the lady's slipper orchid, nests for northern goshawks and the creeping lady's-tresses.

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- In FSC®-certified forestry, at least 10% of the productive forest land area is set aside for conservation or social purposes.
- Conservation burning is carried out to promote fire-dependent biodiversity.

In line with our commitment to protect endangered species, Billerud has partnered for many years with the Swedish Society for Nature Conservation and provides financial support to protect the endangered white-backed woodpecker. We also support efforts to improve conditions for the pool frog and have conducted research into the best type of habitat for its survival.

In Region North America, Billerud maintains a close connection with the forest and land managers though SFI® Fiber Sourcing Standard certification. As an SFI® program participant, Billerud is a significant financial and in-kind contributor to SFI® Implementation Committees (SICs) in Michigan and Wisconsin where the bulk of our wood fiber purchases are made. SICs are represented by forestry professionals from local forest product companies, professional associations, universities, government agencies, landowner associations, and conservation groups that work together to promote sustainable forestry. This is achieved by sponsoring grants for forest research and educational programs for schoolchildren, landowners, and loggers, as well as developing resources and tools for land managers.

Since 2022, SIC members in Michigan, Wisconsin and Minnesota have worked collaboratively to develop and maintain a regional assessment for biodiversity in sourcing fiber from Forests of Exceptional Conservation Value. The assessment aims to identify globally at-risk species and ecosystems that may be positively or negatively impacted by forest management activities. This information is then used to develop training material for foresters and loggers. The aim is to increase their awareness and offer mitigation guidance for ecosystems and species such as the Karner blue butterfly and Northern long-eared bat.

Targets and metrics

Definition	Outcome 2023	Target 2023
Proportion of domestic wood supply[1], %		
Region Europe	99.5	96
Region North America	100	96
Group-certified forest owners (FSC® and PEFC)[2], no.	258	250

1 Domestic wood supply: Wood sourced from Europe to our European operations. Wood sourced from USA and Canada to our North American operations. Excluding market pulp
2 Target and outcome apply to the European operations

Comment on outcome
The proportion of domestic wood supply was 99.5% (99.3) in Region Europe. The corresponding figure in Region North America was 100% (100). The target for the year, 96%, was thus reached in both regions.

Since 2005 we have had a goal to increase the number of Group-certified private forest owners each year, based on short-term and long-term targets. Our goal for 2023 was to raise the number of private forest owners certified through Billerud to 250 and by the end of the year we had 258 (223). During the year, Billerud certified 39 new forest owners.

Forest owners and timber suppliers, 2023	Bergvik Skog Öst AB	Certified small-holders	Marma Skog
Forest land EU/FAO, ha	318,000	92,400	26,300
Low productive forest land set aside, ha	21,300	8,400	1,800
Productive area voluntary set aside, ha	22,100	7,100	6,500
Area left for nature conservation on harvest site, ha	18,300	5,900	2,500
Forest formally set aside, ha	2,200	minor	2,700
Total area of forest set aside, %	20	23	51

Biodiversity indicators	2023	2022	2021
Follow-up of considerations, about 60 sites			
Acceptable sites in terms of consideration for social values, such as trails and tracks	100	100	97
Quality of nature conservation and cultural considerations in follow-up:			
Sites without rutting with a major or moderate impact >85%	93	90	88
Sites with acceptable buffer zones >90%	100	90	100
Acceptable buffer zone area, %	100	92	99
Acceptable handling of sensitive habitats >85%	97	94	96
Acceptable sensitive habitat area, %	98.5	98.8	99.6
Correct handling of high stumps >95%	91	92	97
Average no. of high stumps/ha	4.6	4.9	4.8
Correct handling of green/living/preservation trees >90%	96	93	97
Correct handling of open areas >85%	97	98	98
Correct handling of cultural relics >90%	95	100	100
Acceptable handling of individual cultural relics, %	99	100	100
Correctly handled ancient relics 100% (0, 1 and 2 means handled correctly)	100	100	100
Acceptable handling of individual ancient relics, %	100	100	100

The table above shows some of the results of the monitoring of operational indicators for biodiversity in our own forest management in Sweden 2021-2023.