

2021

# Green bonds

Rereporting



# Foreword

In 2017, Sveaskog made a decision on a new green framework. The principles behind the framework are called the “Green Bond Principles” and aim to promote investment in projects that provide environmental sustainability. Sveaskog’s framework has been reviewed by Det Norske Veritas — GL.

In 2017, SEK 1 billion was issued under the framework. In 2018, Sveaskog did not issue any new green bonds, but in April 2019, a total of SEK 1.1 billion was issued, and in 2020, a further total of SEK 1.7 billion was issued.

This year, 2021, Sveaskog has issued SEK 1.1 billion in green bonds. There was a lot of interest, and the bonds were primarily placed with investors from Sweden and Finland.

Limiting global warming is one of the greatest challenges of our time. In this context, standing timber and the use of wood have an important role to play in counteracting climate change.

As Sweden’s largest forest owner, with 14 per cent of the productive forest land, Sveaskog endeavours to increase forest growth through sustainable forestry, which creates more wood raw materials that can replace fossil-based materials and increases the uptake of carbon dioxide in the atmosphere.

With their natural properties, forestry and wood raw materials have a key role in the development towards a sustainable, bio-based society.



14%

of Sweden’s productive forest land  
is owned by Sveaskog



# Climate benefits of standing timber

The importance of climate change and how we should tackle it are issues that are growing in importance both in Sweden and internationally, which affects the view of forestry and the forest as a raw material. The global climate agreement COP21, which the countries of the world agreed on in Paris in December 2015, describes the use of the forest as a success factor in limiting the global temperature increase to two degrees and preferably keeping it below 1.5 degrees. The IPCC also highlights the importance of sustainable forestry in efforts to counter climate change (IPCC, 2019, IPCC 2021). Measures highlighted as important for the forestry sector include replanting, reforestation of deforested areas and increased use of sustainably produced bioenergy, which is entirely in line with the Swedish forestry model.

Every year, Sveaskog's forests contribute a net uptake of just over 6 million tonnes of carbon dioxide, and the harvested raw materials from Sveaskog's forest contribute an estimated substitution benefit in the same order of magnitude. The company's forests buffer much of Sweden's domestic climate emissions, while our wood raw materials are used for products that are phasing out our fossil dependence. In this way, Sveaskog is contributing significantly to Sweden's goal of net zero emissions by 2045 and the ambition of becoming the world's first fossil-free welfare state.

The climate benefits of the forest are threefold:

- 1) The annual change in the carbon stock in tree biomass and land.
- 2) Harvested Wood Products (HWP), the stock change in forest products, i.e. the annual change in the carbon stock in society when wood raw materials are used for various products such as sawn materials, boards and paper.

- 3) A third significant climate benefit is the substitution effect that occurs when forest products replace fossil-based materials, also referred to as displacement.

With continued investments in increased growth, Sveaskog estimates that growth in our forests will increase, with increased timber stocks as a result. At the same time, we expect to increase timber extraction. This means that the overall climate effect of our operations will increase further and with it Sveaskog's contribution to society's climate goals.

## Annual change in carbon stock on forest land

Sweden's forests are growing, and they absorb more carbon dioxide than they emit. This is why the forest is a carbon sink. Since the early 20th century, stocks of standing timber in the Swedish forests have doubled, while extraction of wood raw materials has also doubled. This is partly a result of Sweden introducing reforestation legislation early on, and partly through continuously improved forest management that results in increased growth. Today, Sveaskog's regeneration felling is about 60–65 per cent of the annual growth, which means that the carbon stock in Sveaskog's forests is constantly increasing. By investing in long-term sustainable forestry, carbon stocks in Sveaskog's forests can continue to increase for many years to come, while the company can continue to supply climate-smart products and energy.



Sveaskog's forests buffer for ten per cent of Sweden's domestic climate emissions.



“By looking at the entire chain from forest to industry and consumption, some estimates can be made as to **how large emissions can be avoided with a harvested cubic meter of wood raw materials.**”

## Stock change in forest products in society

When wood raw materials are used for various products, the carbon stock in the forest is moved out into society. Long-lived products from the wood raw materials are referred to as HWP (Harvested Wood Products) and form part of Sweden's national reporting to the UN Climate Convention. About half of the volume of raw materials harvested in the forest goes to the pulp industry and half goes to the sawmills. Half of sawlogs become something other than solid wood products; chips go to the pulp industry, and sawdust and bark become biofuels. Correspondingly, about half of the raw materials that go to the pulp industry become something other than pulp, e.g. bioenergy for the production of electricity and heat, but also biofuels, chemicals and textiles; see Figure 1. This means that approx. 50 per cent of the total wood raw materials harvested from the forest are used for sawn materials, boards, paper and pulp, while the remaining amount is converted to bioenergy.

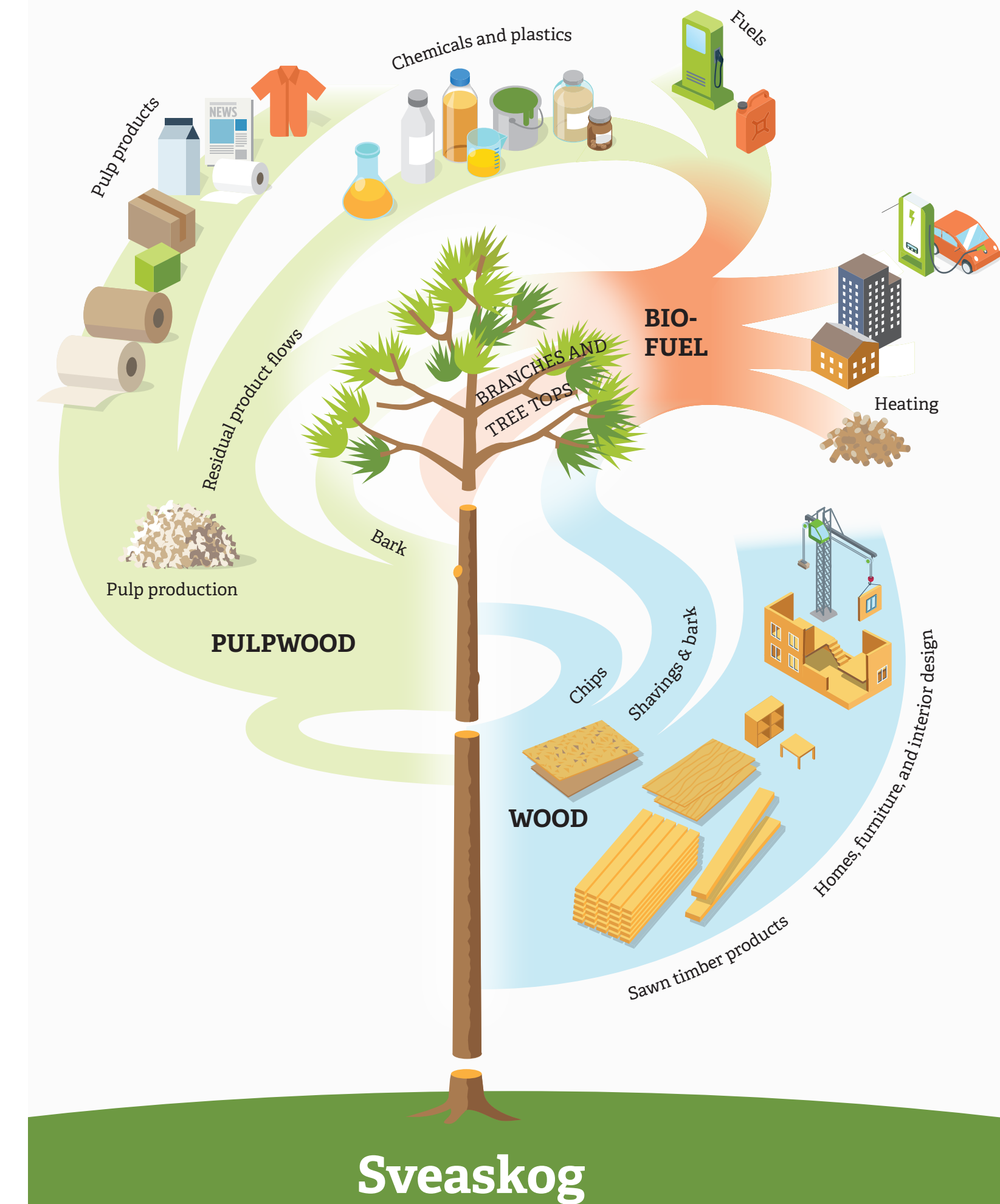
### Displacement — The substitution effect

By looking at the entire chain from forest to industry and consumption, some estimates can be made as to how high emissions can be avoided using a harvested cubic meter of wood raw materials. This offers a

perspective on how effectively a harvested cubic metre contributes to counteracting climate change. There is no standardised way of calculating the substitution benefit, but assumptions about this are based on all forest products having a substitution effect, i.e. if the product does not exist, it is replaced by another product with carbon dioxide emissions that were not previously included in the atmospheric cycle. Furthermore, it is assumed that an increased supply of forest products does not mean increased consumption, but that the forest products replace or contribute to replacing coal, oil, natural gas and cement. Based on how the wood raw materials are used in Sweden, becoming sawn products, board materials, paper and cardboard as well as biofuel, this thus entails a reduction in fossil emissions through substitution or displacement, which is an additional and major climate benefit from the forest industry.

Sveaskog's green bond issue of SEK 1.1 billion from March 2021 has financed sustainable forestry and development projects aimed at increasing the climate benefit of forests and wood raw materials, and reducing energy consumption or the use of fossil resources. The following pages indicate the projects to which the bonds have been allocated.

**Figure 1.** Use of wood raw materials with residual product flows.  
Source: Sveaskog.





# Sustainable forestry

Using the forest sustainably increases growth and thus also carbon dioxide sequestration. Sveaskog's current investments in sustainable forestry according to the Swedish forestry model are divided into the following projects:

## Forestry

### Planting

For every tree felled on Sveaskog's land, three new seedlings are planted to ensure regeneration. Well-executed regeneration is the first important step in ensuring the quality and value of the new forest. With the new plant in the soil, carbon dioxide once again begins to accumulate in the forest stand. Every year, Sveaskog plants just over 40 million new seedlings.

### Cleaning

Through cleaning, the stand development is controlled so that the best trunks with the highest quality have room to develop optimally. The purpose of the cleaning is to optimise the growth of the trunks that are left behind by removing competing trees, but cleaning also opens up the forest, thus making it more attractive for outdoor activities after a few years. Cleaning is normally performed once or a couple of times before the stand turns 30.

### Thinning

Thinning further improves the quality of trees left behind. The goal of thinning is to optimise the proportion of timber, i.e. the proportion of wood that can later be used for long-lived products such as sawn timber. Tree trunks harvested during thinning are primarily used for pulpwood, but also timber and bioenergy.

Sveaskog's total investment for forest management during the period April 2020 to March 2021 amounted to SEK 708,513 thousand, of which SEK 493,027 thousand was financed via green bonds.

**Main environmental benefit:** Increased carbon dioxide sequestration.

## Fertilisation

Fertilisation is an effective way of increasing growth and thus also carbon sequestration. Usually a forest stand is fertilised 10–15 years before felling and the increased growth is estimated to be between 10–20 m<sup>3</sup> per hectare, corresponding to an increased carbon dioxide sequestration of between 10–20 tonnes of CO<sub>2</sub> per hectare. In 2020, Sveaskog fertilised a total of 6,885 hectares, which will thus generate an additional carbon sequestration of between 60,000–130,000 tonnes.

Sveaskog's total investment for fertilisation during the reporting period amounted to SEK 21,923 thousand, of which SEK 15,256 thousand was financed via green bonds.

**Main environmental benefit:** Increased carbon dioxide sequestration.



Regeneration felling

All forests sequester carbon dioxide, but tree growth decreases with age, and thus also their ability to sequester additional carbon dioxide. Managed forest therefore contributes the greatest climate benefit in the long term as high growth persists. If you also take into account the substitution benefit of all the products from wood raw materials that replace fossil energy and energy-intensive building materials, the climate benefit of the managed forest is considerable.

Every year, Sveaskog performs thinning and regeneration felling on approximately 40,000 hectares or approximately one per cent of our land.

Sveaskog works actively to prevent a negative environmental impact during felling and aims to ensure that 99 per cent of all felling takes place without a serious impact on conservation and cultural values. Before each felling, a conservation value assessment is carried out and environmental considerations are planned in detail. In all forestry measures, environmental considerations are taken into account, including water's edge zones, the leaving behind of valuable trees/ groups of trees, and biotopes requiring consideration. On average, 12–14 per cent is left behind as an environmental consideration during felling.

Sveaskog's total investment for regeneration felling during the reporting period amounted to SEK 705,570 thousand, of which SEK 491,000 thousand was financed via green bonds.

**Main environmental benefit:** HWP (stock change in forest products) and Displacement (substitution benefit).

Nature conservation

An important component of sustainable forestry is nature conservation work. With regard to the forms of nature conservation work, Sveaskog has developed its own strategy. We work with multiple tools at different scales, ranging from environmental considerations during felling to areas set aside for high conservation value forests and large contiguous landscapes that we call ecoparks. Sveaskog works both to preserve high conservation values and to reinforce and recreate conservation values. The latter we do through active conservation management measures.

Sveaskog has already made a big investment in nature conservation by designating ten per cent of the productive forest land area below the tree line as high conservation value forests, and it has also established 37 ecoparks. In total, 28 per cent of Sveaskog's forest land is excluded from timber production. In 2020, we have, among other things, carried out deciduous forest and grazing habitat restorations, recreated wetlands and removed obstacles to migration in watercourses in order to strengthen and recreate conservation values.

A large proportion of all Swedish streams and rivers have been cleared for log driving or power extraction. This has had a major negative impact on the ecological values in these waters. In the Mörrumsån river and its tributaries, we have seen the almost explosive recovery power inherent in ecologically functional restoration.

Sveaskog's total investment for nature conservation during the reporting period amounted to SEK 14,884 thousand, of which SEK 10,330 thousand was financed via green bonds.

**Main environmental benefit:** Reinforced conservation values.

During restoration measures, ecological functions are recreated and the conditions for the fauna of the watercourses are improved; an example after biological restoration in the Mörrumsån river is pictured.







## Research and development

Sveaskog collaborates in its development projects with various players, e.g. from universities, forestry and the transport industry. The projects usually run over several years and Sveaskog's investments in the projects during the reporting period are reported below. In total, Sveaskog's investments for these projects amounted to TSEK 11,606, of which TSEK 11,400 was financed via green bonds.

### Somatic embryogenesis

Somatic embryogenesis (SE) is a method of vegetatively propagating the best plant material that comes from the breeding. This means that you can be selective on the breeding front and thus provide the market with the absolute best forest cultivation material much earlier than through traditional mass propagation. It also means that an unlimited number of new embryos can be produced from a single seed. Sveaskog has been instrumental in the development of SE seedlings for a number of years and the goal is now to automate the process of propagation. The cultivation of these micro-plants is significantly more environmentally efficient compared to traditional plant breeding because up to six times as many plants can fit in a greenhouse, which saves energy.

Sveaskog's total accrued cost during the reporting period amounted to SEK 7,465,000.

**Main environmental benefit:** Lower energy consumption.

### Effekt 20

Effekt 20 is an extensive inventory programme in six of Sveaskog's 37 ecoparks. In collaboration with researchers from Lund University and the Swedish University of Agricultural Sciences, we evaluated how nature conservation initiatives have affected the presence of saproxylic beetles and forest bird species in the ecoparks. By comparing the ecoparks with reference areas over time, the programme aims to evaluate the effect of nature conservation initiatives in the landscape.

Sveaskog's total accrued cost during the reporting period amounted to SEK 1,370,000.

**Main environmental benefit:** Increased knowledge of effective nature conservation measures.



SE seedlings contribute to the efficient and environmentally friendly cultivation of seedlings in greenhouses.

### Industry-leading consideration inventory

Sveaskog's goal is for 99 per cent of forestry activities related to felling to be carried out without major environmental impact. This goal is evaluated through annual inventories taken by the Swedish Forest Agency that examine the management of so-called environmental considerations taken during felling, such as water's edge zones, areas with ecological qualities not being felled and cultural environments being taken into account. This evaluation then forms the basis for the continued development of good environmental considerations. In the last two years, Sveaskog has succeeded in implementing 98 per cent of all forestry activities without major environmental impact.

Sveaskog's total accrued cost during the reporting period amounted to SEK 2,162,000.

**Main environmental benefit:** Increased knowledge of effective environmental considerations in forestry.

### Auto2

The working environment for machine operators who operate harvesters, tillers and forwarders is physically stressful, both in terms of noise and uneven terrain. Driverless and remote-controlled forwarders would mean an improved working environment for many machine operators. Auto2 is a technology development project financed by Vinnova and the forestry industry in which numerous universities and forestry and machinery companies are collaborating, including Sveaskog. The project includes both partial and full automation of the machines. If the cabs can be decommissioned, this will also mean lighter machines, which in turn means lower ground impact.

Sveaskog's total accrued cost during the reporting period amounted to SEK 330,000.

**Main environmental benefit:** Improved working environment and reduced ground impact.





Forestry is transport-intensive and therefore Sveaskog works on projects that enable larger and longer transports.

Damaged forest

In Norrbotten and Västerbotten, large areas of damaged young forests have been observed. These younger forests have been affected by several different types of damage, mainly game grazing and fungal infestations. In some cases, the damage is so extensive that the requirements for reforestation are not satisfied. Forest damage causes lost growth and lower timber qualities, which results in poorer resource utilisation. It is therefore a priority for Sveaskog to deal with the damaged forests. As a first step, an extensive young forest inventory has been taken, and Sveaskog is participating in research projects linked to the problem along with the Forestry Research Institute of Sweden, the Swedish University of Agricultural Sciences and the Swedish Forest Agency, among others. The next step is to devise a plan of action to deal with the damaged forests.

Sveaskog's total accrued cost during the reporting period amounted to SEK 93,000.

**Main environmental benefit:** Increased growth and therefore increased carbon dioxide sequestration.

Larger and longer vehicles

Forestry is transport-intensive and therefore Sveaskog works with projects that enable larger and longer transports, partly to reduce transport costs and partly to reduce fuel consumption and thus carbon dioxide emissions. One such project is the Större Travar (Bigger Stacks) project, where trucks with the capacity to load more are used so that the total weight amounts to 74 tonnes compared with the traditional 60–64-tonne trucks. With En Trave Till (One More Stack) vehicles, the transport capacity can be further expanded to 90 tonnes. Studies show a reduction in fuel consumption, and thus also carbon dioxide emissions, of between 8–14 per cent compared to ordinary trucks. Such a reduction in fuel consumption corresponds to reduced carbon dioxide emissions of 6,000–10,000 tonnes annually for Sveaskog.

Sveaskog's total accrued cost during the reporting period amounted to SEK 123,000.

**Main environmental benefit:** Reduced use of fossil fuels.

Flowcut

Sveaskog, in collaboration with researchers, forestry companies and contractors, is running the Flowcut project, which aims to develop a technology that makes it profitable to utilise wood raw materials from deciduous tree felling. The goal is to achieve profitable thinning in dense, neglected stands, and a successful project would mean that we can utilise some of the raw materials that are otherwise often cleaned and left in the forest. This would increase the supply of biofuel that can be used to replace fossil resources.

Sveaskog's total accrued cost during the reporting period amounted to SEK 63,000.

**Main environmental benefit:** Reduced use of fossil resources.



Damage from both game grazing and resin top disease in young pine forest.





## Financing and refinancing forest land acquisition

Sveaskog is Sweden's largest forest owner with a land holding of almost 4 million hectares (2020). All our forest land is certified according to the forest certifications FSC® and PEFC™. In this way, we contribute to promoting sustainable forestry in the world.

The FSC is a voluntary international system and is the only forest certification that is broadly supported by the global environmental movement. FSC-certified forestry provides financial returns but also takes into account environmental values and social conditions. Biodiversity, ecologically valuable environments and ancient monuments are protected. Employees are offered contractual and safe working conditions. The Sami and the general public are given insight and the opportunity to influence. Particular consideration is taken in forestry activities affecting Sami cultural sites, reindeer grazing areas or important recreational areas. PEFC is similar to the certification rules developed by the FSC but is more adapted to family forestry.

Sveaskog continuously acquires new forest land which is then always FSC and PEFC certified. In this way, sustainable use of the forest

and forest land is ensured. The acquired forest land is also covered by Sveaskog's environmental goals, which means that our voluntary set-asides have been expanded corresponding to 20 per cent of the acquired productive forest land. With green bonds, we can both finance new forest land acquisitions but also refinance loans for previous acquisitions. During the period April 2020 to March 2021, Sveaskog acquired a total of 861 hectares of forest land at a price of SEK 81 million. The certified forest land constitutes the absolute largest share of Sveaskog's balance sheet.

Sveaskog's total investment for acquisition of forest land during the reporting period amounted to SEK 81 million, of which SEK 79 million was financed via green bonds.

**Main environmental benefit:** FSC and PEFC certification of forest land.



# Summary of Sveaskog's green projects

## Sustainable forestry

### Market area North

Project name	Project category according to framework	Total investment (SEK)	Total accrued costs (SEK) allocated to green bonds as at 31/03/2021	Proportion of projects financed by green bonds (%) as at 31/03/2021
Forestry	Sustainable forestry	335,456,703	233,431,595	70
Fertilisation	Sustainable forestry	7,565,964	5,264,867	70
Regeneration felling	Sustainable forestry	297,421,927	206,964,637	70
Nature conservation	Sustainable forestry	6,091,565	4,238,889	70

Main measurable environmental benefit as a result of the financing

A net uptake corresponding to 3,185,000 tonnes of carbon dioxide.

### Market area South

Project name	Project category according to framework	Total investment (SEK)	Total accrued costs (SEK) allocated to green bonds as at 31/03/2021	Proportion of projects financed by green bonds (%) as at 31/03/2021
Forestry	Sustainable forestry	373,055,943	259,595,481	70
Fertilisation	Sustainable forestry	14,357,335	9,990,725	70
Regeneration felling	Sustainable forestry	408,152,371	284,017,753	70
Nature conservation	Sustainable forestry	8,752,877	6,090,795	70

Main measurable environmental benefit as a result of the financing

A net uptake corresponding to 1,715,000 tonnes of carbon dioxide.

### All of Sveaskog

Project name	Project category according to framework	Total investment (SEK)	Total accrued costs (TSEK) allocated to green bonds as at 31/03/2021	Proportion of projects financed by green bonds (%) as at 31/03/2021
Forestry	Sustainable forestry	708,512,646	493,027,076	70
Fertilisation	Sustainable forestry	21,923,300	15,255,593	70
Regeneration felling	Sustainable forestry	705,574,298	490,982,391	70
Nature conservation	Sustainable forestry	14,844,442	10,329,684	70

Main measurable environmental benefit as a result of the financing

A net uptake corresponding to 4,900,000 tonnes of carbon dioxide.







Research and development

Project name	Project category according to framework	Total accrued costs (SEK) allocated to green bonds as at 31/03/2021	Proportion of projects financed by green bonds (%) as at 31/03/2021	Main measurable environmental benefit as a result of the financing
Somatic embryogenesis	Research and development	7,400,000	99	Lower energy consumption
Effekt 20	Research and development	1,300,000	95	Increased knowledge of effective nature conservation measures
Industry-leading consideration inventory	Research and development	2,100,000	97	Increased knowledge of effective environmental considerations in forestry
Auto2	Research and development	330,000	100	Improved working environment and reduced ground impact
Larger and longer vehicles	Research and development	120,000	98	Reduced use of fossil fuels
Flowcut	Research and development	60,000	95	Increased access to biofuel that could replace fossil resources
Damaged forest	Research and development	90,000	97	Increased growth and therefore increased carbon dioxide sequestration

Financing and refinancing property acquisitions

Project name	Project category according to framework	Total investment (SEK)	Total accrued costs (SEK) allocated to green bonds as at 31/03/2021	Proportion of projects financed by green bonds (%) as at 31/03/2021	Main measurable environmental benefit as a result of the financing
MA South	Acquisition of forest land	71,000,000	69,500,000	98	FSC and PEFC certification of 653 ha forest land
MA North	Acquisition of forest land	10,000,000	9,800,000	98	FSC and PEFC certification of 163 ha forest land

Summary

Green bond issues 2021	1,100,000,000
Investment in sustainable forestry	1,009,300,000
Investment in research and development	11,400,000
Financing property acquisitions and refinancing	79,300,000
Remaining funds not invested	–



# Report adopted at meeting of Sveaskog’s Green Bond Committee

Stockholm, 9 March 2022

Kristina Ferenius,  
Chair

Anders Jakobsson

Olof Johansson

Cecilia Östlund







# Appendix 1. Climate benefit calculations

The carbon balance of the forest is determined by several different processes. Via photosynthesis in green plants, carbon dioxide is absorbed from the atmosphere and converted into carbohydrates. Some of the absorbed carbon dioxide is released again via the respiration required for metabolic needs in trees and other plants. While the trees grow, some carbon is allocated down to the ground via the roots and when conifers and cones fall down to the ground. Dead organic matter is gradually broken down by different organisms, which leads to carbon dioxide being emitted back into the atmosphere.

In the managed forest, there is a factor of importance to the carbon balance, the actual harvesting of trees. This means that part of the growth is taken out in the form of wood raw materials, which are then used for consumption in society. If we assume that the wood products would be replaced by something else that has a fossil origin or is based on cement, we can estimate a substitution benefit that the harvested wood raw material provides, also called displacement.

However, in the report on the climate benefit that Sveaskog's forest and forestry have contributed to, only the climate benefit brought about by the net growth is taken into account. Since Sveaskog only felled 63 per cent of the annual growth, the carbon stock in the standing forest increased. Neither the carbon stock in the ground nor the substitution benefit has been included, which means that the climate benefit of the forest and the wood raw materials is underestimated.

The reporting period runs from April 2020 to March 2021. Growth calculations are made for the full year 2020 as the growth season is usually March to October.

To calculate the amount of carbon sequestered by Sveaskog's forests during the year, the following formula has been used:

$$\text{Total carbon sequestration (tonnes)} = \text{Net growth (m}^3\text{fo)} \times \text{BEF} \times \text{CF}$$

Where,  
Net growth = The change in standing timber stock (m³fo)  
BEF = Biomass Expansion Factor, conversion figures to determine total biomass expressed in dry weight  
CF = Carbon Fraction, carbon in dry wood

**Table 1.** Using parameters to calculate carbon content.

Tree species	CF (tonnes C tonnes dry weight.-1 )	BEF
Pine	0.51	0.7
Spruce	0.51	0.8
Source	(IPCC, 2006)	(Lehtonen, et al. 2004)

The following formula has been used to convert carbon sequestration into carbon dioxide sequestration:

$$\text{Total carbon dioxide sequestration (tonne)} = \frac{\text{carbon sequestration (tonnes)} \times \text{CO2 molecule weight}}{\text{C molecule weight}}$$

In 2020, the net growth on Sveaskog's entire land holding was 5.2 million m³fo, which corresponds to a carbon dioxide sequestration of 7 million tonnes. The bonds have financed 70 per cent of forestry activities recognised as green projects within the framework of sustainable forestry. Therefore, 70 per cent of the total climate benefit with net growth as a result of financing is also reported.



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