

Wood Resource Policy 2030

Strategy, Objectives and Wood Action Plan 2021–2026



Schweizerische Eidgenossenschaft
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Wood Resource Policy 2030

Strategy, Objectives and Wood Action Plan 2021–2026

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Authors

Ulrike Pauli-Krafft, Claire-Lise Suter Thalmann, Christian Aebischer, all Wood Action Plan programme management, FOEN

Consultants

Paul Steffen, Vice-Director (FOEN), Michael Reinhard, Head of Forest Division (FOEN)
Daniel Zürcher, Deputy Head of Economics and Innovation Division, FOEN, Alfred W. Kammerhofer, Head of Timber Industry and Forest Management Section (FOEN)
Andreas Keel, Director, Holzenergie Schweiz; Daniel Furrer, Swiss Association of Master Carpenters and Furniture Makers (VSSM); Daniel Ingold, Director, Cedotec, Lignum Office romand; Heinz Beer, Board Member, Holzbau Schweiz; Jean Rosset, Representative, Conference of Cantonal Forest Directors; Roland Wiederkehr, Board Member, Lignum Holzwirtschaft Schweiz; Urban Brüttsch, Deputy Director, WaldSchweiz; Urs Luginbühl, Holzindustrie Schweiz (HIS)

FOEN Contacts

Michael Reinhard, Tel. +41 58 46 96911,
michael.reinhard@bafu.admin.ch
Alfred W. Kammerhofer, Tel. +41 58 46 30308,
alfred.kammerhofer@bafu.admin.ch

Text, editing

diktum.ch, Mike Weibel, Zurich

Content Consultants

Martin Riediker, former President, NRP 66: Resource Wood
Bernhard Pauli, Head of Forestry Department, School of Agricultural, Forest and Food Sciences (HAFL)
Hans Rupli, former President, Holzbau Schweiz
Ivo Gasparini, Forest Division (FOEN)

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Abstracts

The Wood Resource Policy supports Switzerland's sustainable development strategy. It makes significant contributions to forest, climate, energy and regional policy and other sectoral policies, and also to the Sustainable Development Goals of the UN. The Federal Office for the Environment (FOEN) is the lead agency for this policy. It is implemented with relevant partners mainly through the Wood Action Plan with its two priority areas: Swiss wood value added and Climate-Appropriate Buildings, and the cross-cutting themes: Communication and Innovation.

Keywords:

Wood Resource Policy, Wood Action Plan, sustainable wood supply, resource-efficient wood use, cascade use, innovation, communication, forestry and timber value-added networks, bio-economy, bio-based development

Die Ressourcenpolitik Holz (RPH) unterstützt die Strategie der nachhaltigen Entwicklung der Schweiz. Sie leistet signifikante Beiträge zur Wald-, Klima-, Energie- und Regionalpolitik und zu weiteren Sektoralpolitiken wie auch zu den nachhaltigen Entwicklungszielen der UNO. Dem Bundesamt für Umwelt (BAFU) kommt dabei die Führungsrolle zu. Zur Umsetzung dient in Zusammenarbeit mit Partnern insb. der Aktionsplan Holz (RPH) mit den zwei Schwerpunkten «Wertschöpfung Schweizer Holz» und «Klimagerechte Bauten» sowie den Querschnittsthemen «Kommunikation» und «Innovation».

Stichwörter:

Ressourcenpolitik Holz, Aktionsplan Holz, nachhaltige Holzbereitstellung, ressourcen-effiziente Holzverwertung, Kaskadennutzung, Innovation, Kommunikation, Wertschöpfungsnetzwerke Wald und Holz, Bioökonomie, biobasierte Entwicklung

La politique de la ressource bois soutient la Stratégie pour le développement durable 2030. Elle apporte une contribution substantielle à différentes politiques sectorielles, en particulier les politiques forestière, climatique, énergétique et régionale, ainsi qu'aux Objectifs de développement durable des Nations Unies. Placée sous l'égide de l'Office fédéral de l'environnement, la politique de la ressource bois est mise en œuvre en collaboration avec des partenaires, notamment au moyen du plan d'action bois. Ce dernier s'articule autour des priorités «Valeur ajoutée du bois suisse» et «Construction respectueuse du climat» et des thèmes transversaux «Communication» et «Innovation».

Mots-clés :

Politique de la ressource bois, plan d'action bois, façonnage durable du bois, valorisation efficace de la ressource bois, utilisation en cascade, innovation, réseaux de valeur ajoutée des forêts et du bois suisse, bioéconomie, développement biosourcé

La politica della risorsa legno sostiene la strategia per lo sviluppo sostenibile della Svizzera. Fornisce importanti contributi per la politica forestale, climatica, energetica e regionale, altre politiche settoriali come pure per il raggiungimento degli obiettivi di sviluppo sostenibile dell'ONU. L'Ufficio federale dell'ambiente (UFAM) assume in tal ambito il ruolo guida. Per l'attuazione in collaborazione con i partner si appoggia in particolare sul piano d'azione Legno, che pone l'accento sui due punti chiave «Valore aggiunto del legno svizzero», «Edilizia rispettosa del clima» e sui due temi trasversali «Comunicazione» e «Innovazione».

Parole chiave:

politica della risorsa legno, piano d'azione Legno, messa a disposizione duratura del legno, valorizzazione del legno rispettosa delle risorse, utilizzo a cascata, innovazione, comunicazione, rete di creazione di valore aggiunto bosco-legno, bioeconomia, sviluppo su base biologica

Foreword

A cubic metre of wood grows every three seconds in the Swiss forests; over an area covering 32% of Switzerland. Naturally, without artificial fertilisers. Wood is a renewable and climate-neutral resource which can make a vital contribution to Switzerland's transformation from a fossil-based to a bio-based society and economy. This is why the Swiss Confederation, under the leadership of the Federal Office for the Environment, has been committed to the sustainable supply and efficient use of wood from Switzerland's forests since 2008 through the Wood Resource Policy. It builds on federal forest policy for a coherent policy inside and outside the forests.

The climate warming poses far-reaching challenges for the environment, society and increasingly the economy too. Large quantities of damaged wood increase. There is a disparity in wood supply and demand. Yet timber construction is booming in Switzerland. Buildings in wood have found their way into the cities and are an integral part of today's built environment. The properties of wood allow sustainable development and densification of communities.

The Wood Resource Policy supports the federal climate and energy policy, because large-scale substitution of high-emission and energy-emission construction materials with domestic timber construction materials reduces Switzerland's carbon footprint. The public sector has an important role to play here as it defines building standards, formulates procurement guidelines, commissions construction projects and provides tax incentives. Because Switzerland's forestry, timber and energy wood industry is an important economic factor in the rural and mountain regions, increased use and processing of wood is also consistent with the federal and cantonal New Regional Policy and Spatial Development Policy.

The Wood Action Plan is the most important instrument for implementation of the Wood Resource Policy. Evaluations show that the Wood Action Plan made a substantial contribution towards attaining the objectives of the Wood Resource Policy and also to sub-objectives of other sectoral policies.

It is pleasing that in this phase other federal offices apart from SECO and the FOE see synergies between their policies and the Wood Resource Policy, such as in procurement and the Confederation's housing, cultural and spatial development and agricultural policies. In future the Wood Resource Policy will continue in partnership. It also wants to be open to new stakeholders helping to further use of wood from the forests of Switzerland.

Katrin Schneeberger
Director Federal Office for the Environment (FOEN)



Timber is eminently suitable for the addition of storeys and densification due to its low specific gravity. A new roof in a building in Lausanne (Vaud).

Summary

Introduction

A third of Switzerland's land area is covered by forest. One of the most important natural resources of the country grows here: the climate-neutral and renewable raw material wood. The forest management and wood harvesting are both done in a way which protects the ecosystem and is sustainable. Fertiliser is not used in Swiss forests, which are predominantly natural, and wood is only harvested where it regrows. Wood remains the main source of income for the forestry enterprises.

Positioning

The Wood Resource Policy forms a separate action programme which supports the objectives of the Forest, Climate and Energy Policy and the Sustainable Development Goals (SDGs). It falls within the global context of different megatrends and contributes to various sectoral policies of the Confederation.

As the lead agency, the FOEN actively promotes cooperation with other federal agencies, the forestry, timber and energy wood sector, the cantons and other stakeholders promoting the use of Swiss wood.

Vision

Wood will be a characteristic component of architecture and interior design in the future and will have a positive effect on quality of life. This will be driven by a sector which is committed to building a society based on renewable resources. Its operations are environmentally and socially compatible, regionally rooted and nationally and internationally competitive. The wood from Swiss forests is used in full and reused repeatedly.

Main objective

The Wood Resource Policy makes a major contribution to the objectives of the Forest, Environment, Climate and Energy Policy and promotes the sustainable development of Switzerland.

With its cooperative, sustainable and market-led approach, the sector is effectively developing the Swiss forestry and timber added value chain.

Objectives

The Wood Resource Policy pursues three objectives:

1. To increase the use of Swiss wood and wood-based products.
2. To supply, process and use wood and wood-based products from Switzerland sustainably and in line with demand at all stages.
3. To secure the competitiveness of the forestry, timber and energy wood industry through innovation.

Wood Action Plan

The implementation programme for the resource policy is established for six more years and supports innovative projects which boost and develop the use of Swiss wood (Article 34a and b Forest Act). It responds to current challenges, such as the increased incidence of damaged wood due to storms, drought and beetle infestation, by focusing on new areas of exploitation and use such as wood-based bioproduct plants.

Priority areas

The focus of the Wood Action Plan is on the two priority areas of Swiss Wood Value-Added Chain and Climate-Appropriate Buildings.

The Wood Action Plan promotes communication projects on the two priority areas. Innovation forms an important element in implementation of the programme.

Organisation

The FOEN manages and controls the Wood Action Plan. An advisory committee comprising representatives of the forestry, timber and energy wood industry, other federal authorities, the cantons, nature conservation and environmental protection organisations, the property sector and communications provides guidance on strategic issues. A committee of experts assists with evaluation of project applications.



This sessile oak (Quercus petraea) in the managed forest near Olten (Solingen) is a home for woodpeckers and ground dwelling species.

1 Facts and Figures

Switzerland's forests...

- cover a third of its land area
- contain over 500,000,000 trees
- consist of nearly 70% coniferous and 30% broadleaf trees
- grow by an area the size of Lake Zug annually or the size of 15 football pitches daily
- produce more than one cubic metre of wood per head of population every year
- are among the largest in Europe with standing wood stocks of 350 cubic metres per hectare
- have seen less wood harvested than regrows for decades
- are under pressure due to storms, heat, drought and parasites caused by climate change
- belong to some 250,000 different owners, 3,500 of them public and 244,000 private
- half their area shelters communities and traffic infrastructure
- are habitats for around 20,000 animal and plant species, i. e. around half the native species

Swiss wood...

- grows for 80–120 years on average before being harvested
- thrives naturally without fertiliser or substances harmful to the environment
- produces a one metre square cube every three seconds
- is harvested in quantities of 5 to 6 million cubic metres annually
- is now made up at low levels of 40% of young beech trees, which will therefore be the dominant species in Switzerland's forests in 40 to 60 years' time
- one cubic metre of energy wood replaces 200 to 300 litres of light heating oil
- now supplies 12% of the heat energy generated in Switzerland
- is suffering reduction in quality due to climate change and needs new pathways for exploitation of the weak timber assortments
- is the main source of income for the domestic forestry enterprises
- is lightweight and ideal for building densification of cities and conurbations
- is now found in nearly 10% of new builds

Switzerland's carbon footprint...

- gains triple benefits from forests and wood (Three Ss)
 - sequestration of carbon in the forests
 - storage of carbon in wood products
 - substitution of fossil building materials and fuels with wood
- rule of thumb: 1 cubic metre of wood stores 1 tonne of CO₂

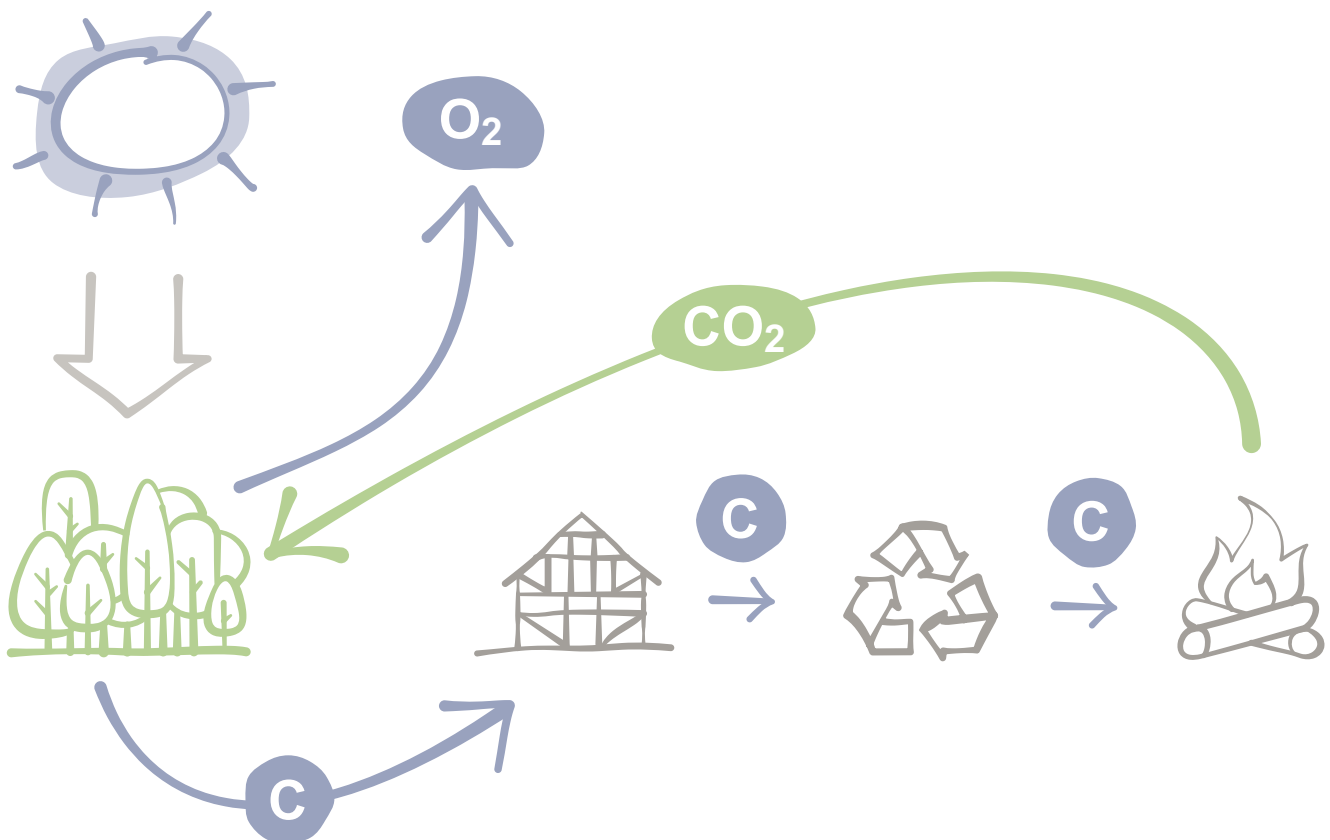
The Swiss forestry, timber and energy wood industry...

- employs around 95,000 people, many of them in peripheral regions
- generates approximately CHF 6,000,000,000 in added value, or 1% of gross domestic product, annually
- offers around 15,000 apprenticeships in over 20 different occupations
- employs 6% of women in forestry and 16% in the timber sector
- suffers from some disconnected value-added chains and needs to redevelop lost processing stages
- is losing value added from wood processing because about one-fifth of the round wood harvested is exported
- recorded domestic wood consumption of 11.2 million cubic metres in 2018
- makes approximately the same contribution to GDP as renewable energy or the primary production in agriculture excluding downstream value-creation chains
- achieves 7 times more value-added or 7 times more jobs in material use than in energy use

Figure 1

The carbon cycle

The greenhouse gas carbon dioxide (CO_2) is converted during photosynthesis in the presence of solar radiation. Oxygen (O_2) is released into the atmosphere and carbon (C) is stored in the wood. At the end of its life cycle, for example, the wood is burned and CO_2 is released back into the atmosphere. Wood is therefore CO_2 -neutral over its entire life cycle.





*Beech (*Fagus sylvatica*) is excellent for load-bearing structures due to its great strength. Fagus Suisse has built a production centre for hardwood processing at Le Breuleux (Jura).*

2 Introduction

Wood is an important natural resource which grows in the forests of Switzerland. A third of its land area produces this renewable, climate neutral, natural product which can be used as a material (construction materials, paper/cellulose, chemicals) or a fuel source (heat, electricity, fuel). Wood could also increase in importance in the future as a source of carbon for the chemical and pharmaceutical industries.

With greater prosperity, pressure on the natural resources is increasing both within and beyond Switzerland's borders – as is the population's need for unspoilt nature, security and good health. The Resource Policy aims to support the optimum use of resources. The FOEN uses the terms "resource policy" and "environmental policy" as synonyms. The Wood Resource Policy formulates guardrails for sustainable harvesting and efficient use of wood as a raw material while taking into account the different interests relevant to the forests, the objectives of the Climate and Energy Policy and sustainable development and the economic concerns. A bioeconomy strategy for Switzerland could also support the transformation from a non-renewable economy and society to one based on renewable resources.

The standing timber stocks in the Swiss forests are increasing constantly. The reasons are the small-scale forest ownership structure, the supply behaviour of the forest owners, the high harvesting costs arising from the nature of the forest terrain and the weak demand for certain wood assortments, particularly in hardwood. Making optimum use of a resource means exploiting its potential to the full. For this reason, it is deemed necessary for the Swiss Confederation to commit to the sustainable harvesting and use of Swiss wood. With a view to translating this commitment into targeted action, in 2008 the federal authorities formulated the Wood Resource Policy under the leadership of the FOEN and in close cooperation with the relevant sectoral policy makers and the Swiss forestry, timber and energy wood sector. It was updated in 2013, 2016 and 2020.

Since 2009, the Wood Resource Policy has been implemented through the Wood Action Plan. The priority here is on the environmentally and economically rational use of wood. Use cascades or cycles which prioritise material use over energy use are particularly advantageous from the perspective of resource efficiency and economic desirability. However, Switzerland lacks processing capacity in certain individual areas for seamless cascade use. In the case of wood used as a fuel, the aim is to achieve these pathways with high overall efficiency.

For a long time, consumers believed that the wood products on offer in Switzerland were made from Swiss wood. This is largely the case with energy wood, but is only true in half of the cases of the material use of wood, such as furniture or construction products. In recent years, the forestry and timber sector and the Wood Action Plan have focused on Swiss wood so that more of the added value is obtained in Switzerland. The FOEN uses the term Swiss wood to mean wood which is grown in the Swiss forests. Swiss wood does not mean the sector brand.

The evaluations carried out towards the end of each programme phase (2009–2012, 2013–2016, 2017–2020) and the feedback from the stakeholders affected show that the objectives defined for the Wood Resource Policy were the right ones. In terms of the period up to 2030, the objectives have been adapted to focus on strengthening the forestry and timber value-added networks. The main strategy is still to contribute to resolving current social policy challenges, particularly in relation to Switzerland's Climate, Energy and Regional policy. To implement these objectives, the Wood Action Plan will be continued from 2021–2026.



A third of private forests are in agricultural ownership. Around 80,000 farms own about 125,000 ha of woodland.

3 Megatrends

Long-term global forces for change called Megatrends unleash profound social, natural and technical upheavals. In the last four years, special editions and events on the subject of Megatrends – Wood City have taken place, supported by the Wood Action Plan.

In terms of the construction market, the key megatrends relate to technology, society and ecology. This is already apparent now in a shift towards small apartments, increasing user density and low-cost living.

What are megatrends?

Megatrends are the main drivers of change. They are effective in the long term and can have an impact over decades. A megatrend influences the political and economic position of entire sectors, organisations and countries.

In 2019 the Council for Spatial Development (ROR), on behalf of the Federal Council, assessed the possible effects of megatrends on Switzerland's spatial development and issued recommendations.

Eight megatrends are significant for the Wood Resource Policy.

Globalisation

Globalisation is a process in which trade in goods and services, the markets and production become more transparent between countries. It becomes simpler and cheaper to exchange goods, capital, people and technology. Globalisation brings great advantages for Switzerland: in recent years it has actually benefitted more than any other country. Switzerland has one of the world's most closely networked economies. No other country has seen its per capita income rise as fast as Switzerland as a result of the growing global networking.

As an industrial product, wood is exposed to the global market. However, values such as "home" and "identity" are gaining ground. This is manifest in the higher status now given to vernacular architecture, local heritage assets and unspoiled landscapes.

Digitalisation

Digitalisation means the conversion of analogue data to digital formats. Digital networking along the value-added chains and the full life cycle of market performance offers great economic opportunities for industry. They range from higher productivity through innovation in products and services to new business models and processes. Digitalisation makes Industry 4.0 possible. Unlike previous technology-driven revolutions, it does not involve a single system, but a combination of different methods and digital technologies and networking of people, products, machines, systems and enterprises to develop new potential.

The Building Information Modelling (BIM) was strongly influenced by timber construction.

Demographic change

The global population will rise to 9.3 billion by 2050, so that a third more people will be living on the planet than in the year 2000. By then there will also be more people aged 60 than aged 15 in the world for the first time. The percentage of over 64 year olds increased from 5.8% in 1900 to 18.1% in 2017 and by 2040 will make up a quarter of the population at 25.6%, according to the FSO population scenarios.

This demographic change requires renovation of properties and adaptation to the different needs. The demand for suitable housing concepts will increase. Timber construction, with its modular and flexible design, can play a role here.

Urbanisation

Since 2008 most of the world's population has lived in cities. The figure will be five billion by 2030. Many new megacities with more than ten million inhabitants will emerge.

Switzerland's urbanisation level, which is the percentage of the population living in cities, is already 85% and will continue to grow.

Wood, and timber construction, has also become more urban in recent years. Outstanding buildings have been constructed in wood, particularly in urban areas.

Individualisation

The trend towards individualisation which had already begun in the 1980s has intensified. Traditional relationships within society such as social class, religion and gender have lost their importance. Many duties previously performed by the family are now largely passed on to society – often the State – (e.g. childcare and care of the elderly). In the urban centres in particular, the traditional family model will be increasingly replaced over time by partnerships and new forms of household. In today's multi-option society, individuals see themselves as faced with apparently endless choices, which many find overwhelming.

At the same time, there is a renaissance in cooperatives for energy projects or housing developments. Many modern timber buildings have been constructed by housing cooperatives in recent years.

Climate change

Rising temperatures are leading to increased storms and heavy rain, heat and drought. In the past 30 years the temperatures in alpine regions have increased by nearly twice the global average. Climate models indicate that towards the end of the 21st century summer droughts in Switzerland will be more frequent, more intense and will

last longer. Heavy precipitation is likely to be more severe, but low winter temperatures will be rarer.

In the forests, this will lead to changes in the tree species and therefore in the wood supply. The pace of change is so great that the existing species have no time to adapt and the quality of the wood from some species is already declining. With chemical methods, these assortments can be used for new wood materials.

Scarcity of resources

Population growth is leading inevitably to a greater demand for finite, and also renewable, resources. Economical use of the resources is essential. The principle of the circular economy is logical in relation to finite resources. As for the renewable resources, sustainable use is the priority. This has been the practice of the Swiss forestry industry for over 100 years.

The pressure on land in the urban regions requires solutions which conserve resources. Spatial development is calling for inward and upward intensification. With its low specific gravity, wood is ideally suited for greater build density in the cities.

Ecologisation

Since cities are responsible for 70% of all greenhouse gas emissions but only occupy 2% of the land mass, it is important for buildings to be sustainable as urbanisation continues. Green office buildings are equipped with sustainable energy technologies, contain concepts to reduce waste and use natural light, in order to improve the economic, social and ecological performance of the property.

From production to dismantling, incineration and ultimate disposal, the materials most suitable for this are those with low pollutant levels such as natural wood.

Conclusion

Global trends and the worldwide population growth are driving the global demand for renewable materials. Bio-based products can be renewable as well as recyclable. Globalisation and digitalisation allow the world to move closer, but only virtually. A return to the local – as a counter-trend to globalisation – is occurring at all levels. Economically, products manufactured in their regions are becoming more appealing to consumers. Politically, more attention is being paid to local regulations.



Nothing is wasted: the tiniest particles and process waste (sawdust) are reused by Swiss Krono in Menznau (Lucerne). In a rational product life cycle, and finally for energy generation.

4 Positioning

Legal basis

The Forest Act (SR 921) forms the legal framework for the Wood Resource Policy. This policy and its implementation are based, in particular, on Article 34a on the sale and use of timber: “The Confederation promotes the sale and use of sustainably produced wood, in particular through the support of innovative projects.”

The following articles of the Forest Act are also relevant: Art 1, let. c on the maintenance of forest functions; Art. 20 on the forest management principles; Art. 31 on research and development; Art. 33 on surveys; Art. 34b on federal buildings and installations with sustainably produced wood.

Significance

The Wood Resource Policy is a federal action programme. The FOEN acts as lead agency for this policy and assumes responsibility for the implementation of the Wood Action Plan in particular, in coordination with the relevant stakeholders. They include, in particular, the Federal Office of Energy (SFOE), the Federal Office for Spatial Development (ARE), the State Secretariat of Economic Affairs (SECO), the Federal Office for Agriculture (FOAG), the Federal Office for Culture (FOC), and the Federal Housing Office (FOH), the Swiss forestry, timber and energy wood industry, the cantons, the relevant universities, the property sector and the environmental associations.

The Wood Resource Policy is an autonomous, user-driven policy. It has numerous overlaps with other sectoral policies (see Fig. 1). It is most closely associated with the Forest Policy, Objectives and Measures 2030, with which it is closely integrated. It particularly addresses the objectives of the Forest Policy relating to sustainable timber production and defines compatible objectives for the sustainable exploitation of Swiss wood. This is necessary for a coherent policy, especially on hardwood which now has an increasing share as climate warming and drought advance. In the last ten years, however, the

proportion of hardwood used directly to produce energy has risen to around 70%. The intention behind implementation of the Wood Resource Policy is therefore to contribute to finding other value-creating uses in preference to energy applications.

System boundaries

The system boundaries of the Wood Resource Policy extend from the forest – supplier of the resource – through the entire value-added chain (material, chemical, energy) to the use (final consumption), including end-of-life recycling or energy use (cascade cycle).

The Wood Resource Policy is based on Art. 77 of the Federal Constitution and the utility function of the Swiss forests defined in Art. 1c of the Forest Act, and on the conviction that for Switzerland’s sustainable development, local, renewable resources should be used wherever economically rational. In the light of the other forest functions and other environmentally-relevant factors, there could be some potential for conflict which would then necessitate balancing of interests. The Resource Policy is also intended as a framework for this. Balancing of interests with the Biodiversity Policy, Soil Policy and Air Pollution Control Policy of the FOEN, for example, may be necessary.

Forest Policy

Objective 1 of the Forest Policy aims to fully exploit the potential offered by sustainably harvestable wood. The use of wood, a renewable resource, improves Switzerland’s carbon footprint (by storage of carbon in installed timber and substitution of fossil fuels and non-renewable materials), helps job creation in peripheral regions, contributes to protection of the environment in regional economic cycles and can create synergy effects with the policy for promotion of biodiversity and make an important contribution towards a circular economy and bio-based economic development (bioeconomy). But this potential is not

fully exploited. For decades now, less wood is harvested than regenerates – particularly in private woodland and mountain forests. Hence Switzerland has one of the highest volumes of standing wood in Europe. This weakens the stability of the forests in relation to climate change.

Biodiversity Policy

As the forests are home to around 40% of Switzerland's animal and plant species, a balance has to be found between natural forest development, very valuable habitats, ecological infrastructure and timber production. Fortunately, the results of National Forest Inventory (NFI) 4 show that overall Switzerland's forests are a relatively natural ecosystem. They usually regenerate naturally. Non-natural spruce monocultures have continued to decrease on the Central Plateau. The proportion of introduced tree species is still very small in nearly all the regions. Many NFI indicators show the Swiss forests ranked first in Europe. The Biodiversity Policy aims at a reserve area of 10% in the forests by 2030, 4% more than at present.

Soil Policy

The forest floor has a variety of functions and brings great benefits, including for humans: filtering of clean drinking water, protection from flooding and runoff, supply of water and nutrients to the trees and plants and high carbon storage. In 2020 the Federal Council adopted the Swiss National Soil Strategy and a package of measures to protect soil as a sustainable resource. For economic and health and safety reasons, sustainable use of wood as a raw material requires efficient processes with modern forestry equipment. However, it is important to assess the long-term consequences of mechanised wood harvesting on the forest floor and to constantly develop the quality management so that its total sustainability is maintained. The increasingly frequent frost-free winters represent a challenge. Since no chemicals are used for management in the Swiss forests, the forest floor is not exposed to pollution of this kind, but the high inputs of atmospheric nitrogen are a problem.

Air Pollution Control Policy

Wood burning generates around 12% of Switzerland's heat production and causes a substantial proportion of its particulate emissions, though large automatic burners now generate hardly any emissions. But at the same time, energy wood comes from a renewable, climate-neutral source, which supports the National Climate and Energy Policy. These contradictory effects can be balanced by appropriate requirements for wood burners and their inspection.

Landscape and Parks Policy

There are various interfaces with the Landscape and Parks Policy: in terms of the forest as an element with landscape relevance and in terms of wood through sustainable timber production, regional value-added and cultural imprint. The Swiss Landscape Concept updated in 2020 defines concrete goals for the forests which are also integrated in the Wood Resource Policy.

Waste Policy and the circular economy

Switzerland generates over 17 million tonnes of waste annually from building conversion and dismantling. Currently only a tiny proportion of the usable components are reused in other projects. To reduce the loss of embodied energy and raw materials, reuse must be consolidated and reinforced in the construction process. An objective included in the Wood Resource Policy is to keep wood in the material cycle for as long as possible, with high value-added and due consideration of health factors, until it is finally reduced to ash.

Climate and Energy Policies

The two policies are closely linked. Their aim is to increase energy efficiency and the proportion of renewable, climate-neutral energy sources. In August 2019, the Federal Council decided that by 2050 Switzerland's greenhouse gas emissions should not exceed what can be absorbed by natural and technical storage; this means net zero emissions by 2050.

The forest and wood resources can contribute to Swiss climate policy in three different ways: sequestration in the forest, storage effect through wood harvesting and use in durable timber products and substitution for more energy-intensive materials (three Ss: Sequestration in the forest, Storage in timber products and Substitution with wood). As a renewable and climate-neutral material for construction and energy, wood supports the objectives of both policies in the key buildings sector, particularly on embodied energy, energy efficiency of building systems and greenhouse gas emissions. Over the full life cycle, the CO₂ emissions from timber buildings are only half those of solid concrete or brick buildings. Large numbers of energy-efficient buildings are built entirely of timber or have timber facades and roof elements, because almost the entire wall and roof thickness can be used for insulation.

New Regional Policy

This is aimed at improving competitiveness and value-added, primarily in the rural areas and mountain regions where the Swiss forestry, timber and energy wood sector represents an important local economic factor. Industry is a priority area, specifically the promotion of Regional Innovation Systems (RIS). Since 2020 greater focus has also been placed on the issue of 'digitalisation', and specific 'New Regional Policy pilot measures for the mountain regions' should help these regions to realise their economic potential even more effectively.

Spatial Development Policy

This aims to achieve 'inward settlement development', characterised by high-quality built environment densification, particularly in cities and conurbations. Wood and prefabricated timber systems are light and flexible building materials, making them ideal for the purpose.

Sustainable Development Strategy (SDS)

Since 1997 the Federal Council has set out its policy intentions for implementation of sustainable development in Switzerland in a strategy. Agenda 2030 and its sustain-

able development goals (SDGs) form the reference framework for the Sustainable Development Strategy 2030.

Agricultural Policy

Forestry and agriculture have many common features. About 35% of Switzerland's land area is productive farmland, slightly more than the forested land. Agriculture – like forestry – belongs to the primary sector. An agribusiness generally also includes woodland. And there are agribusinesses which also offer forestry products such as district heating or Christmas trees.

Housing Policy

The Housing Support Act supports not-for-profit housing associations with low-interest, repayable loans. The main conditions are energy criteria, the Swiss Sustainable Building Standard SNBS und freedom from mobility barriers. Timber is often used in not-for-profit housing construction on sustainability grounds.

Architecture Strategy (Baukultur Policy)

The Wood Resource Policy has numerous overlaps with the Confederation's high-quality architecture objectives. From cultural heritage to innovation, this applies whenever building and engineering or professional skills are involved. In its Vision, the Wood Resource Policy seeks wood to be a formative part of the Swiss architecture and interior design culture. This dovetails perfectly with the Architecture Strategy (Baukultur policy) 2020.

Public procurement

The new legal basis for public procurement BöB supports the objectives of a sustainable economy, by also incorporating quality and sustainability criteria, and not just price considerations, in the procurement of goods and properties. The wood industry supports the new legislation and is committed to its targeted application.

The Coordination Conference for Public Sector Construction and Property Services (KBOB) unites Switzerland’s public clients.

The KBOB specialist Sustainable Building group drafts recommendations which have to take account of environmental protection, social needs and economic efficiency throughout the life cycle in construction works. Among the recommendations appearing in 2020 was “Sustainable Timber Construction”.

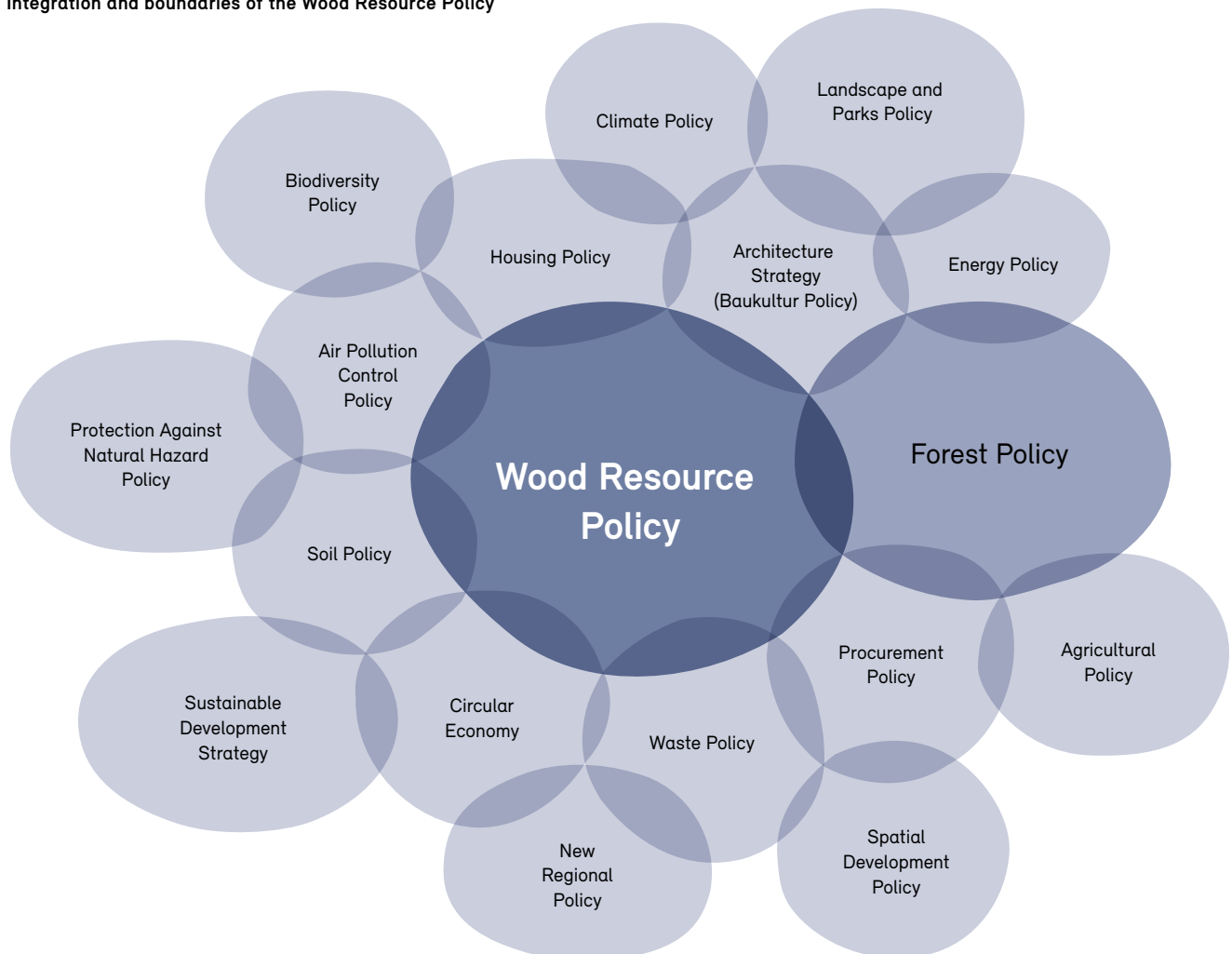
Further strategies and concepts

The Wood Resource Policy can also make significant contributions to Green Economy and Cleantech issues.

With the new Timber Trade Ordinance, Switzerland has produced a regulation equivalent to that of the European Union (EU) and fulfilled a parliamentary mandate. The core of the regulation is a new obligation for those placing wood-based and timber products on the market for the first time: They must prove that they have acted with the requisite care. There is also a connection with the Economic National Supply (BWL) which also protects energy supplies in times of crisis. Energy from wood is a relevant factor here.

As regards federally owned buildings, the Federal Office for Buildings and Logistics (FOBL) ensures that sustainably produced timber is promoted in construction and procurement, in accordance with Article 34b of the Forest Act.

Figure 2
Integration and boundaries of the Wood Resource Policy



The interfaces with stakeholders from research and practice are also being actively addressed. The broadly-based network Swiss Wood Innovation (S-WIN) should be mentioned representatively. All the main universities of applied science, universities and the forestry and timber industry are represented in this network. It supports research and development activities in all areas of the value-added chain with targeted knowledge and technology transfer. Information is also collated from the Resource Wood national research programme (NRP 66) and integrated in the programme.



Wood is a renewable, climate-neutral raw material. It stores carbon in products, substitutes for other materials and fuels with high embodied energy and acts as a carbon sink (sequestration) in the forest.

5 The Swiss forestry, timber and energy wood industry

Forestry

Unlike the timber industry, forestry operates according to long production periods. Whereas the forest is managed in 80 to 120 year cycles, trends in and demand for wood-based products sometimes change every year. This makes it all the more challenging to make decisions now about the configuration of a future forest which will protect all the functions long term and will also service future demand from the timber market. In addition, the impacts of climate change on the forests are a further source of uncertainty for the Swiss forestry and timber industry. Higher quantities of damaged wood are occurring, globally as well as in Switzerland, due to storms, drought, heat and above all the resultant beetle infestation, which are putting severe pressure on the timber market both domestically and around Europe. In 2019 the spruce wood volume infested by the spruce bark beetle doubled in one year to 1.4 million cubic metres, which is the second highest ever recorded.

In this field of tension, the optimum ratio of coniferous and broad-leaved species and of grades and assortments is necessary, along with continuous forest renewal, so that Switzerland's forests remain vital and resilient and there is demand for timber for domestic processing. The forest and wood value added chain can only be functional in Switzerland in the long term if supply and demand are balanced.

The forested area of Switzerland has increased continually for over 150 years. The increase has occurred primarily in the Alps and Prealps, where abandoned alpine meadows revert to forest. The alpine region is also where the standing volume has mainly increased, but stocks, particularly of spruce, have fallen on the highly developed Central Plateau. Economically, spruce remains the most important species and makes up nearly half the timber harvested. In the young forests, however, beech is increasing its share significantly and will be the dominant species in the Swiss forests in the future. In hard-

wood, the energy wood assortment has risen constantly in the last ten years to over 70%. The opposite is true of softwood, where round wood has a 70% share. At around 350 cubic metres of standing wood per hectare, the Swiss forests continue to be among the richest in Europe. This is partly due to the high incidence of large dimensioned timber, which is as high as 80% in many places. The older the tree stocks, the greater the risk of loss of stability and the lower the timber quality.

Climate change also has negative effects on Switzerland's forests. It is also happening so rapidly that it is doubtful whether the forests can adapt and keep fulfilling their diverse functions without human intervention. The Swiss climate has already warmed by 1.9°C since the beginning of industrialisation. This warming is increasing the elevation of the vegetation zones by 500 to 700 metres. In future, therefore, more deciduous trees will flourish in lower lying mountain forests where conifers are currently dominant. Rising temperatures and more frequent droughts during the vegetation period are putting the trees under stress, increasing the risk of forest fires and encouraging infestation by harmful organisms. Among the species affected is the spruce, which suffers greater bark beetle infestation in times of sustained drought. For a long time, forest owners promoted the spruce at lower levels where there would naturally have been broad-leaved or mixed woodland. As the climate warms, spruce will become rarer at lower levels in future, but more drought-tolerant species such as the sessile oak will find conditions becoming better and better. The last few years have been plagued by heat and drought and have shown that beech trees also suffer significantly. The forestry and timber industry is thus facing a particular challenge, because on the one hand Switzerland's forests and their important product – wood – can make valuable contributions by storage of CO₂ in line with the Climate Policy, but on the other hand the forests are themselves severely impacted by climate change.

The numerous, very small, privately-owned areas of woodland make efficient management difficult. Wood harvesting is an important factor for just a fifth of the 245,000 or so private woodland owners. Two-thirds of the Swiss forests belong to 3500 public bodies. 92% of them manage the forest, the majority themselves. Their primary goal is to maintain a healthy and stable forest. Wood production is also important – alongside good drinking water and biodiversity. According to the latest analyses by the National Forest Inventory (NFI), cultivation intensity has fallen continuously overall in recent years. 21% of the forested area is considered to be unmanaged. The forests in the lowlands of the Central Plateau and the Jura are intensively managed and maintained, but less so or sporadically in the high regions of the Prealps and the Alps. One reason is the high management costs. Since the 1980s, most of Switzerland's forest enterprises have been in deficit. Political influences also mean that the costs of operation cannot always be covered. In many cases, the staffing, equipping and structuring of municipal forest enterprises are not based only on management considerations and business-oriented action.

Society's different expectations, particularly of the forest as a place for recreation, are sometimes in conflict with efficient management.

Timber industry

In 2018, LIGNUM, the umbrella association of the forestry and timber sector, with the support of the FOEN, founded the organisation Swiss Wood Marketing (MSH). The objective of MSH is for Swiss wood to be used more. Initially, in 2019 the successful campaign “#WOODVETIA – Campaign for more Swiss wood” was transferred to the MSH campaign “Woodvetia – The land of wood diversity”. Then, with the brand Swiss Wood, MSH positioned the provenance more broadly – to include environmental factors. In recent years, the Swiss forestry and timber industry (1st and 2nd processing stages) has only benefited to a limited extent from the good initial position on the construction market and the boom in timber construction. The round wood segment is flat or growing slowly and the number of sawmills has been decreasing slightly but constantly for years. The reasons include the lack of com-

petitiveness of the forestry and timber industry compared with its European rivals. However, the wood industry has improved considerably in the production of semi-finished products, especially glulam.

A close look at the timber market shows that about 900,000 cubic metres of wood were built into Swiss single and multi-family dwellings and public and commercial buildings in 2016. In 2009 the volume was 750,000 cubic metres, which represents an increase of around 20% in seven years. Between 2012 and 2016 it was in public buildings and multi-family dwellings where use of wood increased.

Overall, the carpentry and timber construction sectors are showing positive growth. In the construction industry they have taken over the leadership and implementation of digital manufacturing. They have well-honed skills in the design, manufacture and installation of their products. They have mature and efficient digital manufacturing technologies. In timber construction in particular, they have developed attractive, high-volume market segments such as multi-storey timber construction, which is significantly increasing the demand for glulam structural timber and wood-based materials. Compared with the product quality and the investment required, however, the margins are unsatisfactory and the structures of some enterprises are too small scale in these sectors.

Positive growth in the quantity of wood processing appears possible if the demand for Swiss wood-based products continues to increase and the wood industry can meet the demand by further investment in processing capacity and services. Increased production of semi-finished products ultimately also helps the forest owners.

The continuance of the paper and wood-based materials industry in the value-added chain is of great importance strategically, because a sawmill cannot profitably exist without income from sales of wood residues. If large industrial wood processors disappear, the whole system starts to unravel. As an example, Pavatex has produced high-quality insulation materials, with over 50% of Switzerland's production, since 1936. Production has now moved from Cham, Switzerland to France. Another example is Boorregaard, the former cellulose plant at

Attisholz. 400,000 tonnes of wood were processed here annually, representing about 15% of the total quantity harvested in Switzerland at the time. When it closed, these hardwood volumes were switched to direct use as fuel. Attempts have been made over recent years to make structural members out of hardwood, as in the House of Natural Resources of the ETH. Since 2020 FAGUS SUISSE AG has been producing components made of beech for structural timber construction, semi-finished products and solid timber boards for furniture and interior fittings at Les Breuleux (Jura). The establishment of potential new uses such as small organic product plants may offer new opportunities for the Swiss forestry and timber industry.

Energy wood industry

In recent years there has been a continual increase in energy wood production and demand. According to forestry statistics, 1.9 million cubic metres of wood for energy (37% of the total harvest) were harvested in the Swiss forests in 2019. About half the wood comes from forests, the rest being obtained from woodland fragments, wood residues from the sawmills, waste timber or waste paper. According to the wood energy statistics, in 2019 around 5 million cubic metres of wood were used for energy, producing over 10 terawatt hours of net energy.

The energy wood share of total fuels in 2019 was 12% at final consumption and comprised nearly 5% of the total final consumption; in motor fuels the share is 0%. In recent years energy wood has generally experienced steady growth, from raw material to heat and power production.



At the inauguration event at the end of July 2017, Federal Councillor Alain Berset expressed how the Origen tower-shaped theatre embodied resilience, robustness, solidarity and stability. The wooden tower stood on the Julier pass at Bivio (Graubünden) until 2020.

6 Wood Resource Policy 2030

Vision

- **Wood is a formative element of the Swiss architectural and living culture and quality of life.**
- **The wood from Swiss forests is used in full and reused repeatedly.**
- **The Swiss forestry, timber and energy wood industry is committed to the development of a renewable resource based society.**
- **The forestry and timber value-added networks are environmentally and socially compatible, regionally based and nationally and internationally competitive.**

The Swiss forests and their wood and the associated sectors in the Swiss forestry, timber and energy wood industry dovetail perfectly with Switzerland's sustainable development strategy. The vision of the Wood Resource Policy 2030 is focussed on central elements which contribute to this.

Wood is the oldest construction and energy material used by Man. From the mid-20th century, there was a move away from energy wood use and generally towards fossil fuels with higher energy density and lower prices. Since the beginning of the 21st century, heat is again being increasingly generated from energy wood, and logs have been superseded by wood chips and pellets in modern biomass burner systems.

Processed wood is a cultural asset which is displayed in traditional wood carvings, rural buildings and bridges and church roof timbers. From the 19th century wood began to be replaced by masonry as a building material – particularly in the cities. Since the start of the millennium it has experienced a renaissance, principally because its environmental and technical benefits are increasing in importance. The material has a broad spectrum of uses, particularly in the context of building densification, and its range is constantly being extended to include many high-performance construction components. Wood is conquering the city. And wood is no longer just associated with the work of craftsmen, it has found its way into engineering. Free form and shell structures in timber make this clear; they are now outstripping other materials.

The 2015 revision of the Swiss fire regulations triggered strong growth in multi-storey construction using timber. In general, however, the timber share of structural materials in new builds, extensions and conversions is currently under 20% in Switzerland. Here the vision sets the course clearly for a future-proof, sustainable Swiss architecture and design culture with wood. The obligation is placed on the Confederation itself, as purchaser. Under Art. 34b, Forest Act, it has to commit to the use of sustainably produced wood in its own buildings and installations where appropriate. The Swiss forestry, timber and energy wood industry wants to be positioned as a reliable partner to help shape the goal of a sustainable Switzerland. The renewable forest and wood resources available to it make it ideal for the task. Cellulose, lignin and hemicellulose have such versatile properties that they can be used as bases and materials for almost all applications of daily life. To exploit these opportunities, it is necessary for the traditional processing chains to be open to new players and for these new networks to comply with all three dimensions of sustainability. Also needed are innovative approaches on products, processes and business models, so that effective use is made of this valuable raw material as fully as possible over multiple product cycles.

As the Swiss forestry, timber and energy wood industry is based in the regions, it makes important contributions to value creation in the rural areas and hence to all the spatially relevant sectoral policies. This should remain the case and be reinforced in future. This means that Switzerland accepts its sustainability responsibility nationally and strengthens the Swiss regions and self-sufficiency, particularly in relation to energy. The potential is there, because wood consumption in Switzerland is double the volume harvested in the Swiss forests. The gap in wood volume and processed products is filled by imports. But not all the exporting countries have comprehensive forest legislation which implements sustainability in all three dimensions at a comparably high level to that of Switzerland. It is regrettable that large volumes of raw wood are exported (623,000 cubic metres) such that no value added is generated within the country. Sawn timber from abroad totalled 375,000 cubic metres in 2019.

Main objectives

- **The Wood Resource Policy makes a great contribution to the objectives of the Forestry, Environmental, Climate and Energy Policy and promotes the sustainable development of Switzerland.**
- **Through sustainable, cooperative and market-led action at all stages, the value-added potential of the Swiss forests will be fully exploited.**

The main objective formulates the strategy of the Wood Resource Policy. It is a question of making valuable contributions to other sectoral policies and the interaction between all the stakeholders, and of exploiting the value-added potential of the Swiss forests and their most important product – Swiss wood – in the way that is best for the environment, the economy and society.

At the forefront are the contributions to the Forest Policy, with which it is most closely thematically linked and the objectives of which it pursues coherently at exploitation level. The Wood Resource Policy attains increased relevance through its contributions to the Climate, Energy and Environmental Policy placed higher on the political agenda. All the spatially relevant sectoral policies such as the Spatial Development Policy and the Regional Policy are also affected by the objectives of the Wood Resource Policy.

To ensure that the value-added potential of the Swiss forests and wood can be best utilised in the long term, and with a large contribution to the sectoral policies mentioned, three criteria are important for stakeholder behaviour: sustainable, cooperative and market led.

Sustainable behaviour and operation in the Swiss forests is defined by the Forest Act. The same requirement applies outside the forests, on the processing side. The approach to cascade use or the circular economy can serve as a yardstick here.

Horizontal and vertical cooperation is the order of the day, due to the small-scale structure of the Swiss forestry and timber industry and the international and national competition. The market-led approach at all stages of processing is necessary so that Swiss wood can assert itself more effectively on national and international markets.

Objectives

1. **The use of Swiss wood and wood-based products shall increase.**
2. **Wood and wood-based products from Switzerland shall be supplied, processed and used sustainably and in line with demand at all stages.**
3. **Innovation shall ensure that the forestry, timber and energy wood industry is competitive.**

The Wood Resource Policy 2030 defines three objectives with targets and indicators (see Annex 2) to be achieved by 2030. The quantified targets represent the current state of knowledge, which will be regularly reviewed and updated. The three objectives are defined and explained in more detail below.

Objective 1

Objective 1 defines a clear quantity goal in terms of the bio-based transformation: Wood shall increase its share compared with non-renewable resources in all areas of application (material, chemical, energy), particularly if the environmental benefit is greater overall.

It relates mainly to all the construction uses of wood, as this is where by far the greatest quantity potential exists (see Targets, Annex), together with a great opportunity for the Climate and Energy Policy. About 45% of final energy use in Switzerland is for construction of buildings, heating and cooling and supply of hot water. The buildings sector generates about a third of Switzerland's CO₂ emissions. This makes it one of the most resource intensive sectors, and it emits large quantities of gases which are harmful to the environment and climate.

Wood benefits energy-efficient construction (such as under the Swiss Sustainable Building Standard SNBS), because it is a building material with better thermal insulation properties than others and it results in less embodied energy during production. Wood is also a renewable and climate-neutral raw material which can be a substitute for energy-intensive materials. A high degree of prefabrication and the low dead weight of timber components make it an ideal material for the inward densification advocated by the Spatial Development Policy.

Wood is increasingly in demand for housing construction. The challenge now is to increase the share of wood from Switzerland's forests through the necessary investment in new processing capacity by the wood industry. Positive volume growth is possible if sufficient processing capacity is available, Swiss wood is marketed more effectively and the demand for glulam structural timber and wood-based materials can be better met on the domestic market. This requires an unbroken, nationally and internationally competitive forestry and timber value-added chain which is also open to new players and markets.

The Energy Strategy 2050 advocates higher efficiency and greater use of renewable energies. With an initial package of measures, the Confederation aims to reduce the average final energy consumption per head per year by 16% by 2020 and by 43% by 2035 compared with the level in the base year 2000. As replacement for the power from the nuclear plants, electricity is to be produced nationally from renewable sources. In the opinion of the FOEN, 25 TWh of renewable energy can be achieved by expansion and exploitation of potential sources.

Wood is the most important indigenous raw material for heat generation. According to wood energy statistics, around 5 million cubic metres of wood from Swiss forests are used for energy every year. In 2019 the 600,000 wood burning systems covered 12% of the national heat requirement and 4.7% of the total energy requirement. Wood is a carbon neutral fuel which saves the atmosphere about 10% of Switzerland's total CO₂ emissions. Power generation – combined with heat production – represents just half a percent of the electricity generated in Switzerland.

To prevent particulate emissions having a detrimental effect on environmental compatibility, the new Ordinance on Air Pollution Control (OAPC) entered into force on 1 June 2018. Its objective is to gradually increase stocks of burners with lower carbon monoxide and particulate emissions.

Because the wood resources listed are limited, energy wood must be used as effectively as possible and with maximum energy efficiency and maximum fossil fuel substitution effect. The Confederation's energy policy position gives high priority to clean and efficient heat production

and heat and power production with high overall energy efficiency and annual utilisation efficiency. Transport fuel supply has only achieved lower overall efficiency to date and is 0%. In recent years, the conversion losses in energy use have gradually fallen, even though the overall efficiency is low with plants which also produce electricity.

In terms of the energy wood harvest, it is a challenge to manage the nutrients found in needle and branch material in particular. Needle and fine branch material is generally left in the forest.

The primary connection with the bioeconomy is in chemical use. This also includes plants in the paper, cellulose and starch industry, some of which have been in operation for decades. For instance, in the 19th and 20th centuries sugar as well as cellulose was produced from wood in Switzerland. In Ems, 3,500 tonnes of glucose were produced annually from wood until 1960. Cellulosefabrik Attisholz AG, founded in 1881 in the canton of Solothurn, was processing 400,000 tons of wood annually in 2008, which represented about 15% of the Swiss wood harvest or one third of the industrial wood. The plant was closed in 2008 by the Norwegian company Borregaard AG. A point worth noting is that although Attisholz AG produced cellulose as its principal product, it also used the spent sulphite liquor for the production of ethanol, yeast and lignosulphonates and produced hydrogen. When entire product lines disappear, the effects are felt throughout the system, because the value-added chain is broken, which ultimately diminishes the regional value-added chain. The revival and expansion of chemical use must be escalated, particularly in the knowledge that climate change is having significant impacts on the forest and wood resources. This is an important forward-looking mission which aims to extend the options for use of the damaged wood which is increasingly occurring. The implementation of the Wood Resource Policy should generate some impetus for this.

Objective 2

Objective 2 defines the criteria underlying the supply and production of Swiss wood and products made from it: To supply 'sustainable' and 'demand led' wood means that it is produced economically and is environmentally and socially compatible, that the productivity of the forest

location is maintained and that the forest continues to fulfil all its legally enshrined functions. Sustainable processing and use mean that resources are used efficiently by achieving the maximum value added and at the same time the negative impacts on the environment are minimised throughout use. The aim should be use cascades or material cycles.

The purpose of demand-led supply and processing is to balance supply and demand at the different stages of processing. For the forestry, timber and energy wood industry, this means that species of trees that are climate stable, suited to the location and economically usable are promoted. For wood-based value creation, it means market-led focus of the offering.

The biggest gap – but also the greatest potential – is offered by supply to the timber construction industry of glulam cross sections from Swiss wood and production. It is estimated that the domestic consumption of glued laminated timber is about three times higher than the domestic production. There is great potential here for Switzerland's sawmill industry in the supply of input materials for glulam cross sections and integrated reprocessing to glued products. The obstacles include the lack of affordable industrial land and funds for a technology switch. Suppliers and customers must work together to resolve these barriers to progress. Coordinated interaction by the associations and enterprises in the wood sector, along with the sectoral policies, is also necessary so that better conditions for local, competitive added value can be created.

Objective 3

Innovation stands for permanent development and the introduction of new methods, products and services and organisation and management systems, and for successful acquisition and development of new markets. In globalised markets it becomes the main foundation for sustainable competitiveness. This challenge can only be overcome long term by highly flexible, knowledge-based enterprises. Technical innovations make a particularly important contribution to economical use of the resources or their substitution.

Due to its small-scale structure, the Swiss forestry and timber sector is often unable to raise and invest suffi-

cient funds for research and development from its own resources. Implementation of the Wood Resource Policy should help to provide good conditions for innovation, for example by supporting applied research and development, knowledge transfer and an innovation friendly environment.

The top priority here is to press ahead with digitalisation of the industrial and service operations (Industry 4.0). The contribution of wood as a resource to the biobased transformation of the economy and society cannot be achieved without innovation and the right framework.



The Bois de Chêne at Genolier (Vaud) is an inviting place for a walk, where those seeking relaxation will experience wood as a raw material in its original form.

7 Wood Action Plan 2021–2026

The Wood Action Plan (WAP) is the most important instrument for implementing the Wood Resource Policy. It has two focal themes and two cross-cutting themes (see figure). The FOEN can support projects on these central themes.

Its implementation is a joint mission by the Confederation and its partners. They mainly include other federal and cantonal sectoral policies, the Swiss forestry, timber and energy wood industry and other stakeholders committed to the use of Swiss wood and wood-based products. Most of the projects are financed jointly.

Findings

The Wood Action Plan 2017–2020 has undergone external evaluation. The evaluation concludes that the WAP should be continued. With over 100 projects realised, it has made a vital contribution to achievement of the objectives of the Wood Resource Policy (WRP). The WAP 2017–2020 was well positioned in concept and target driven in implementation. It has realised a great deal, particularly in the priority area of eco-friendly construction and refurbishment and has contributed to a positive perception of wood as a resource.

For the phase starting in 2021, it is recommended that the WAP and the WRP should both address important overarching and sector-specific developments. These include strengthening and developing value added networks relevant to Swiss wood, adaptation and implementation of Industry 4.0 for the Swiss forestry and timber industry and positioning of wood as a resource in the context of the Swiss Climate Policy and a future Bioeconomy Strategy. So that this can be achieved to maximum effect, greater use should be made of synergies with other sectoral policies and funding institutions by cooperating with stakeholders from other sectors on specific topics or projects. Findings from the WAP should be circulated more widely by investing more resources in knowledge transfer and promoting channels for information exchange between the projects.

Principles

All state funding must be based on economic principles. Alongside these, national political concerns (the public interest) always constitute an important element of a funding policy. According to the Swiss Federal Constitution (Article 103), state funding instruments may also be required on the basis of a political assessment, if the self-help measures available to the private stakeholders are deemed insufficient to handle the structural transformation in the economy. Funding is therefore in a constant state of tension between economic efficiency and political necessity. Against this background, the structure of the funding instruments is of great importance: They should result in minimal distortion of economic competition.

Overall, the Wood Action Plan focuses on accompanying and supporting measures. These mainly include:

- Education, information and knowledge transfer
- Awareness raising, cooperation, harmonisation and coordination
- Applied research and development
- Implementation projects
- Regulatory instruments to increase the use of wood.

In summary, the following principles apply to implementation of the Wood Resource Policy:

- Joint mission: The objectives of the Wood Resource Policy can only be achieved if all the relevant stakeholders contribute. Hence the implementation of the measures defined in the Wood Action Plan represents, in particular, a joint mission shared by the Confederation and cantons, the Swiss forestry, timber and energy wood industry and other stakeholders committed to the use of Swiss wood and wood-based products. This cooperation shall be intensified.
- Strategic role: The Confederation coordinates implementation. It highlights the future challenges relevant to the use and exploitation of wood as a resource, provides information and supplies the decision-making bases.
- Focus on priorities: The resources will be concentrated on the instruments and measures that make the great-

est possible contribution to achieving the objectives and are geared towards marketable solutions.

- Rolling planning: The Wood Resource Policy is conceived as an open and dynamic policy which takes changing framework conditions and new developments into account. Similarly, the Wood Action Plan must also be regularly reviewed and updated.
- Avoiding distortion of competition: The focus of the measures and instruments lies on the pre-competitive and sector-wide context. Projects with proximity to the market are also needed to increase the competitiveness of the Swiss forestry and timber industry and the value added with Swiss wood.

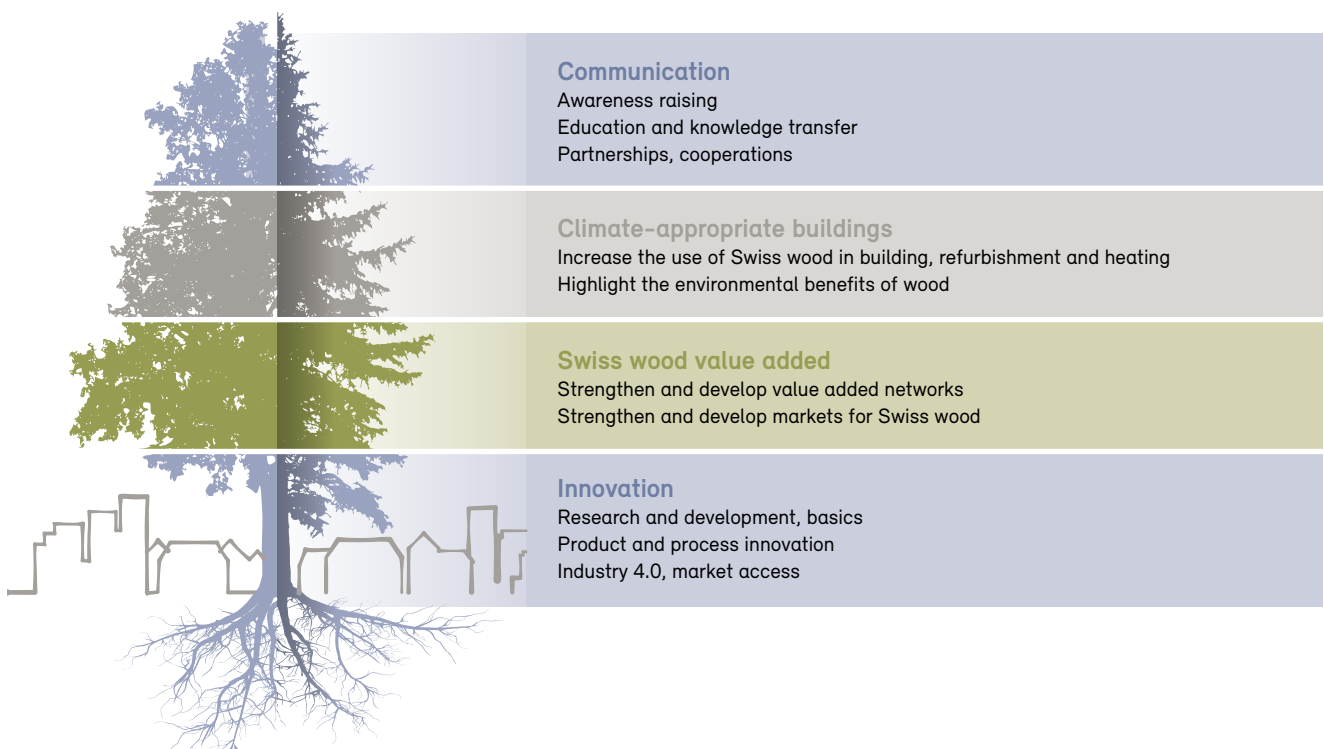
Most of the federal funds support measures on the established market such as the Buildings Programme. The FOEN Environmental Technologies Fund (ETF) funds innovations through to market diffusion. The Wood Action Plan is positioned in the funding environment unambiguously, and uniquely in the mix, in favour of wood. Half the funds in the last phase were invested in communication measures,

the balance being spent on research on market approval and diffusion.

Priorities

The Action Plan 2021–2026 focuses on two priority measures and two crosscutting themes (see Figure 3). Projects can be submitted on the priority areas and the crosscutting theme 'Communication'. The crosscutting area of 'Innovation' is the guiding principle for the entire programme and represents a criterion for the project requirements. The types include projects with proximity to the market, applied research and development projects and communication projects. If projects contribute to the defined priority objectives of the Wood Action Plan and the objectives of the Wood Resource Policy, they qualify for financial support. The conditions and all the documentation necessary for project submissions are explained on the Wood Action Plan webpage. It also contains an overview of projects previously implemented.

Figure 3
Wood Action Plan 2021–2026, priorities and crosscutting themes



www.bafu.admin.ch/aktionsplan-holz [only available in French, German and Italian]

Two priorities take shape from consideration of the objectives of the Wood Resource Policy 2030 and have to be handled under the Wood Action Plan 2021–2026.

Priority

Swiss wood value added

If the aim is to increase the use of wood from Switzerland's forests and wood-based products, the value added and the sales markets need to be revitalised and improved.

This priority therefore pursues two objectives:

1.1 To revitalise and develop Swiss forestry and timber value added networks.

Contribution to objectives two and three of the Wood Resource Policy

1.2 To revitalise and develop the market for wood from Switzerland's forests

Contribution to objectives one and three of the Wood Resource Policy

The competitiveness of the forestry, timber and energy wood industry can be improved through innovative, market-focused collaboration and cooperation models. The growth of a 'We Culture' should support this development. The increased demand for products made from Swiss wood should be serviced by regionalised production networks. Other options may arise if investment funds with a sustainable approach invest in wood as a resource and in the forestry and timber processing chain.

Digitalisation will change the forestry and timber industry profoundly. Industry 4.0 will increasingly find its way into industrial production and logistics. The existing small-scale structures in the sector will change as a result and commercial offerings will be diversified.

The wood-based bioeconomy strategy is intended to promote the development of innovative products and methods and help to increase hardwood value added. The intention is also to examine and implement international coopera-

tion in research and realisation and to open up new market segments.

The focus is on the following topics:

- To increase the market shares of Swiss wood and timber products through future-proof business and cooperation models
- To strengthen market-led product development (material, chemical, energy)
- To exploit the potential of Industry 4.0 in product and process innovation
- To boost the cascade/circular economy/bioeconomy
- To strengthen the 'We Culture' and sector solidarity
- To support knowledge transfer within the forestry and timber value-added chain in order to balance supply and demand
- To develop and operate market radar for forestry and timber value-creation and relevant developments and trends
- To position the Swiss forestry and timber industry in the context of biobased development and the bioeconomy.

Who are the results intended for?

Stakeholders in the Swiss forestry, timber and energy wood industry, stakeholders from the bioeconomy field, the chemical and pharmaceutical industries and public sector decision makers.

Priority Eco-friendly buildings

The contribution of Swiss wood to the Environmental, Climate and Energy Policy and to the sustainable development of Switzerland can be very effectively implemented by using Swiss wood in construction, renovation and heating.

This priority therefore pursues two objectives:

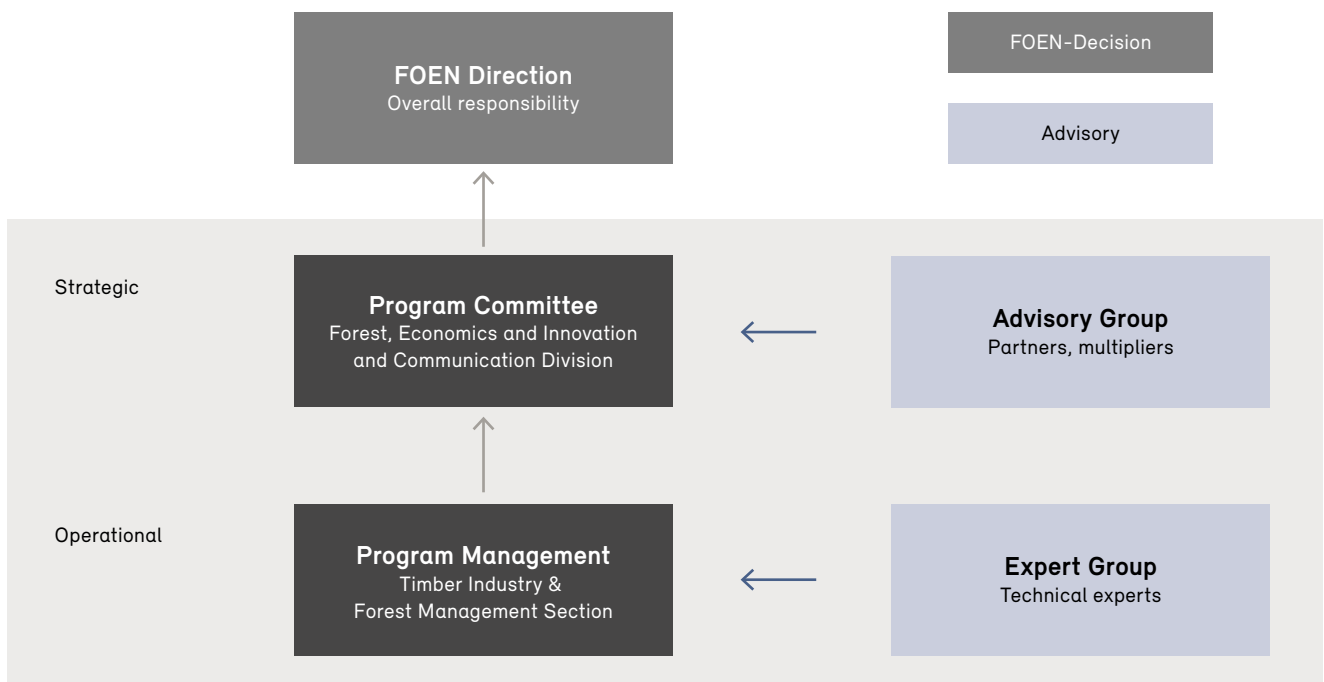
- 2.1 To increase the use of Swiss wood in construction, refurbishment and heating
Contribution to objectives one and three of the Wood Resource Policy
- 2.2 To highlight the environmental advantages of wood and wood-based products
Contribution to objective three of the Wood Resource Policy

Timber construction has become much more widely accepted in urban areas for new builds, addition of floors, extensions and even refurbishment. This is due to the use of intelligent planning and manufacturing technologies,

new framework conditions in relation to fire and noise protection and technical advances in the building systems. To enable the high additional market potential of Swiss wood in the construction industry to be accessed, timber construction needs to take a firmer hold, particularly in urban areas. Targeted knowledge transfer and service offerings to investors, clients and planners will strengthen their confidence in wood as a material and increase their capacity for action on supply, management and liquidation.

When evaluating the economics of a building project, it is essential to consider the costs over the entire life cycle, from project development to dismantling. Because the operating costs normally exceed the investment costs, a focus on the costs of planning and production does not go far enough for investors who are thinking long term. Targeted research and knowledge transfer should bring the target group closer to a factual and comprehensible understanding of the advantages of wood, such as shorter construction periods, low dead weight, more usable space due to slender designs or higher quality due to pre-fabrication in assembly halls. The use – already estab-

Figure 4
Wood Action Plan organisation



lished in the sector – of cooperative planning models (e. g. BIM) should be expanded and any gaps in user information should be filled. Structural data modelling enables a structure to be considered as a whole throughout its life cycle.

The public is increasingly focusing on the fact that CO₂ can be stored in long-lasting wood products. Wood contains around a tonne of CO₂ per cubic metre, which is stored throughout the period of use and is not returned to the atmosphere until the wood is burned or decomposes. This fact should be confirmed and put in comparable form by correct inclusion in the various environmental accounting methods, standards and building certifications. Furthermore, every component made of wood replaces a building material which is more energy intensive to produce.

The focus is on the following topics:

- To use synergies with other sectoral policies and funding institutions to position eco-friendly timber construction
- To strengthen wood and wood-based products in environmental accounting and market-relevant building certification systems
- To expand the market position of wood and wood-based products in building refurbishment and densification
- To illustrate possibilities for ease of dismantling, reuse and recycling of timber buildings and construction elements
- To attract investors, clients, planners and contracting authorities by technical, economic and environmental arguments for building and heating with wood
- To provide service offerings and knowledge transfer to increase the capacity of investors and planners to take action on building and heating with wood
- To position wood and wood-based products in the context of the public procurement laws of the Confederation, cantons, municipalities and cities
- To communicate the contribution of Swiss wood to the Environmental, Climate and Energy Policy and sustainable development to society and politicians
- To use cooperative planning models in building development and optimisation of the life cycle costs of buildings.
- To exploit the potential for digitalisation in the planning, construction, operation, maintenance and dismantling of buildings made of wood
- To transfer knowledge on the life cycle costs of building in wood.
- To exploit the innovation and market potential in the use of energy wood

Who are the results intended for?

The Swiss wood and energy industry, building and property organisations of the Confederation and enterprises affiliated with the Confederation, public clients at cantonal and municipal level, contracting authorities, institutional and private clients and investors, media and social networks and public decision makers.

Communication

Like innovation, communication is a cross-cutting theme. In the two priority areas of the Wood Action Plan, the target groups are defined on a project-specific basis.

Communication itself includes raising awareness, education and knowledge transfer, partnerships and collaborations.

An umbrella communication concept exists as a guideline for applicants. Partnerships are envisaged which include multipliers outside the forestry and timber sector, which further increase the credibility of wood.

The Wood Action Plan only supports activities which are innovative and are based on a communication concept.

Who is the communication intended for?

The target groups for the two priorities, as well as all consumers of Swiss wood and partners and multipliers from other sectors of the economy and politics and within the value-added chain.

Innovation

Innovation is an important element of the programme. In particular, the projects which form the core of the programme must meet defined innovation criteria, as must the programme and project communication. Innovation management will be implemented for this.

Funding and organisation

The FOEN Direction has decided to extend the Wood Action Plan until 2026. Four million Swiss Francs per year continue to be available. This is subject to budget changes by the Federal Council and the parliament.

Financial contributions by the partners are required on implementation of the projects. These are at least 50% of the cost, depending on the process (see www.bafu.admin.ch/aktionsplan-holz) [only available in French, German and Italian].

The FOEN acts as the lead agency for the Wood Resource Policy. In particular, it has a strategic and coordinating function in which special emphasis is placed on the long-term prospects and consideration of the various societal interests relating to the forests and wood as a raw material. The programme control and management are undertaken by the FOEN. The programme management is responsible for proper implementation of the Wood Action Plan. An advisory committee comprising representatives of the Swiss forestry, timber and energy wood industry, the cantons, other federal authorities, environmental organisations, the property sector and communications collaborates on strategic programme committee issues. An expert group supports programme management on project evaluation.



The bark beetle or typographer (*Ips typographus*) exerts pressure on the forests. After storms, heat or drought, it mainly infests spruce trees (*Picea abies*) and damages them. Between one and three larval galleries radiate from a central maternal gallery in the direction of the grain. The holes made by the larvae are at right angles to the grain.

8 Bioeconomy, circular economy and cascade use

Bioeconomy (bio-based development)

As a result of the globally increasing consumption of resources – particularly fossil resources – ecosystems worldwide are reaching the limits of their resilience and sustainability. Switzerland contributes to this due to its high per capita resource consumption. Nearly three planet Earths would be needed if all were to live like the people of Switzerland. The consequences also weaken the resistance of the Swiss economy and society to crises. To achieve a significant reduction in consumption of resources – and the resultant environmental pollution – a holistic approach is needed. Bioeconomy, circular economy and cascade use offer concepts for this and make a major contribution to conserving resources.

The bioeconomy (or bio-based development) is intended to expedite the transformation from a fossil-based economy to one of sustainable raw materials. The European Union defines the bioeconomy as “the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy”. A bioeconomy strategy can clarify how comprehensive the transformation from a fossil to a bio-based economy should be. That strategy could also contribute to the sustainable development in Agenda 2030 with the SDGs and to the Climate and Energy Policy of Switzerland.

The Federal Offices for Energy, Agriculture, Spatial Development and the Environment formulated a strategy for sustainable and optimum production, processing and use of biomass in 2009. It formed the basis for shaping of the various policies of the Confederation. The Biomass Strategy was the first step towards the bioeconomy. Today, various sectoral policies already contain elements of bio-based development. A Swiss Bioeconomy Strategy is intended to build on the existing Biomass Strategy of the Confederation.

Switzerland is a country with strong research and innovation activity. It spends nearly 3.4% of its GDP on research and development. Its pharmaceutical, chemical and food industries in particular are world leaders. Switzerland also has innovative players in the construction industry and in life sciences and healthcare. The agriculture, forestry and timber industries have a wealth of knowhow on managing sustainable raw materials. They are all useful requirements for bio-based transformation of the Swiss economy and society.

The concept of bio-based development and the Wood Resource Policy can be mutually supportive. For the Wood Resource Policy, the enlarged perspective of bio-based development offers opportunities to address new ways to add value to Swiss wood. The Federal Statistical Office (FSO) considers the value added of the Swiss forestry and timber industry to be currently about 1% of Switzerland’s gross domestic product, some 50% being obtained with Swiss wood. Half the total gross value added was already achieved in timber construction in 2011. The value added is lower in forestry and the sawmill and processing industries. An overall increase in the wood-based value added requires new products to be generated and markets to be developed, e.g. wood fractionation for the chemical industry. New, high-value uses could then emerge. This connection between the wood and chemical industries has already begun and new, innovative markets are being developed for wood as a raw material. And from a construction industry point of view, innovative wood fibre based products or even new processes can be created. It is conceivable that furniture or even timber buildings will be manufactured on 3D printers within a few years. The use of wood in its entirety is important for a sustainable increase in value added, which means utilising all parts of the harvested trees and the residual assortments from processing. A strategy for a bioeconomy can address new players and markets outside the traditional value-added chain and the impact of abortive developments can be cushioned.

Circular economy and cascade use

Bioeconomy and the circular economy are often mentioned in the same breath. They are complementary and different. Both focus on resources and seek a more sustainable and resource-conserving economy. The bioeconomy prioritises the “biologising” of industrial value added by promoting the replacement of fossil carbon by renewables. The circular economy aims to maintain the value of finite resources, materials and products for as long as possible.

The cascading approach is another important factor for optimum exploitation of wood as a renewable resource: The process should start with the use that has the highest value added, brings the greatest benefit in environmental terms and allows the greatest multiple use. The combination of these criteria should be sought. The environmental benefits of cascade use come fully into play when wood replaces energy-intensive construction materials at the start of the cascade and becomes energy-efficient fuel at its end. This approach is not productive

as an autonomous strategy, however, partly because it can be a great challenge to implement in practice if integral concepts are lacking or are not yet viable. The conditions for full cascade use are still difficult in Switzerland at present, because significant users are lacking at several stages (for example, cellulose, waste wood). To date there is no universal business model for the different stages in Switzerland, which means that there exists at best a so-called short cascade, from initial use as a building material to use as a fuel.

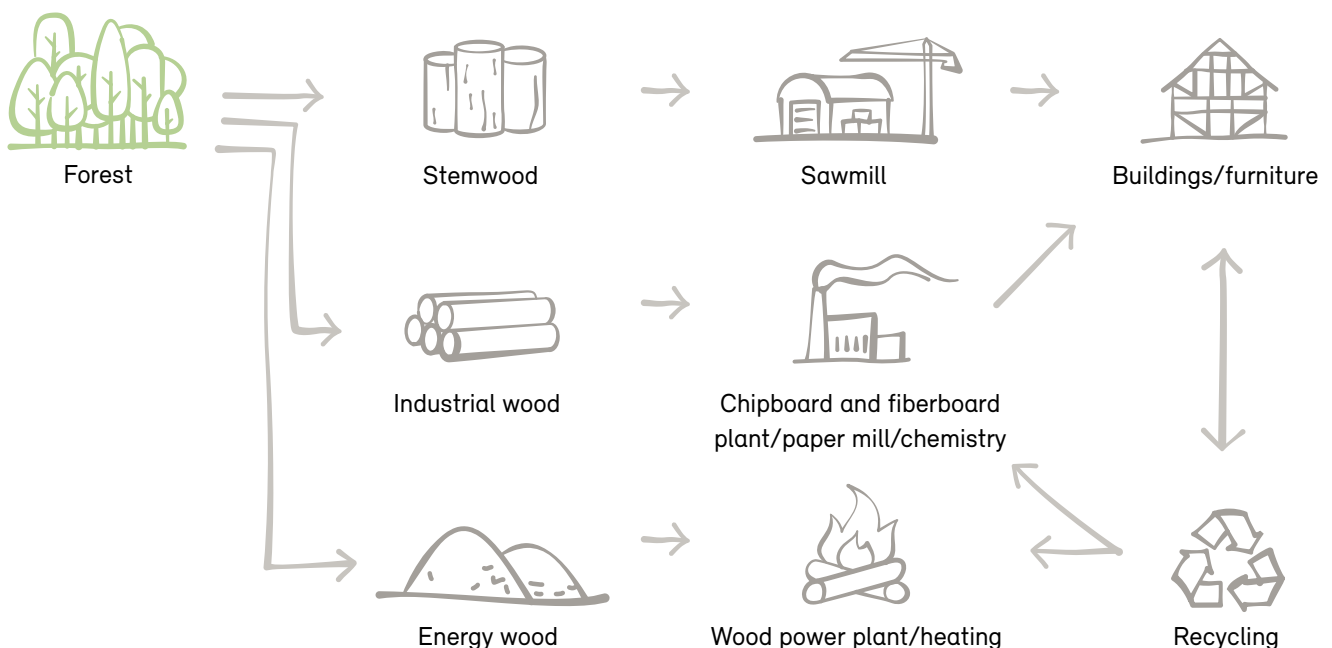
The circular economy and cascade use contain various interfaces and nexuses. It is true of both concepts that the beginning of the production cycle and therefore the product design are critical for successful reuse/recycling with environmental benefits.

Bioeconomy, circular economy and cascade use are important concepts with additional elements which can contribute to more effective implementation of the Wood Resource Policy on various levels.

Figure 5

Circular economy and cascade use

Environmental and economically the most rational cascade use is first as material, then recycling and fuel.



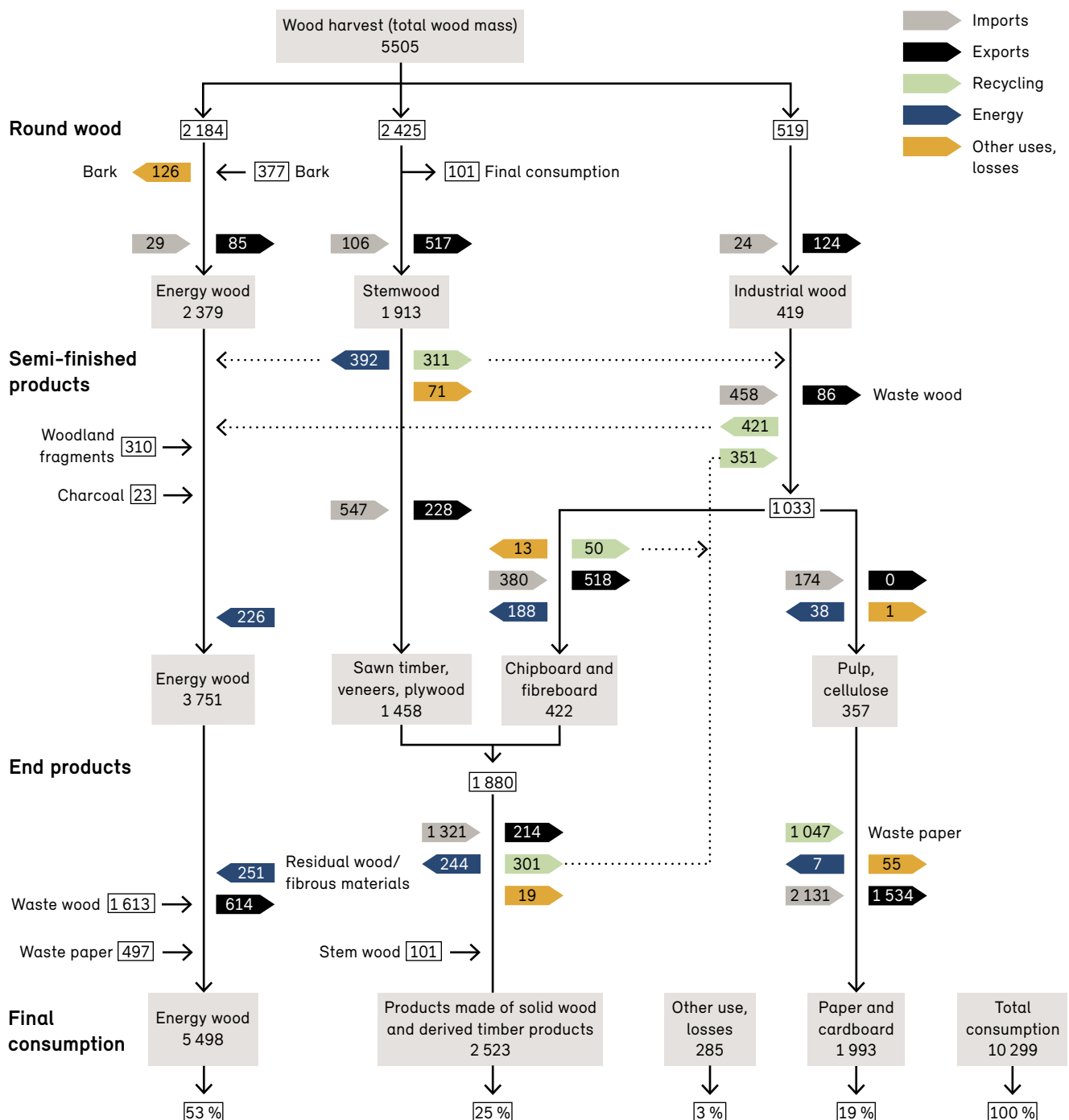


Around half the energy wood is produced from forest wood sources and the other half comes from outside forests, sawmills residues, waste wood and waste paper.

Annex 1 Wood flow

The FOEN has produced a wood flow model for some years. There is now also an interactive configuration of the wood flows <https://apps.inforest.cloud>.

Figure 6
Wood flows 2019 in Switzerland, in 1000 m³ solid wood mass



Calculations without bearings. minor deviations are due to rounding

Source: Calculations and estimations, FOEN, wood division

Annex 2 Objective indicators and target values

Table 1

Objective indicators and target values of the Wood Resource Policy 2021–2030

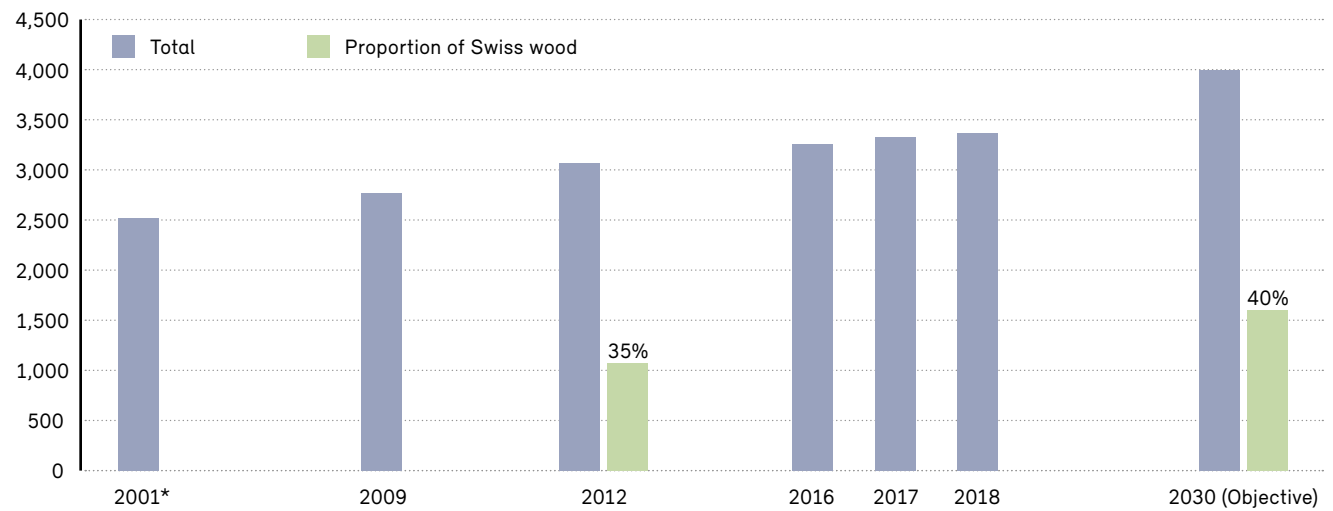
Objectives 2021–2030	Objective indicators	Target values
1. The use of Swiss wood and wood-based products shall increase.	Switzerland's final wood consumption, as a material (excluding paper and board products) Source: Neubauer-Letsch et al. 2015	To increase the demand for wood products used for materials by 30% from 3.07 million m ³ (2012) to 4.0 million m ³ (2030)
	Swiss wood share of final consumption of wood in Switzerland, as a material Source: Neubauer-Letsch et al. 2015 und 2020	To increase the use of Swiss wood in Switzerland's total final consumption of wood as a material from around 35% (2012) to 40% (2030, based on 4.0 million m ³)
	Production of sawn timber and timber materials, Switzerland Source: FSO 2020 Source: FOEN 2020	To increase the volume of sawn timber and timber materials produced using wood from Swiss forests in relation to the development of the demand for timber products
	Wood used for energy Source: FOEN 2020	To exploit the potential for energy wood use of around 6 million m ³ or 16 TWh final energy annually
	Efficiency Source: FOE 2020	To increase efficiency
2. Wood and wood-based products from Switzerland shall be supplied, processed and used sustainably and in line with demand at all stages.	Wood volume harvested from Swiss forests by round wood, industrial wood and energy wood Source: Hofer et al. 2011	Objective 1 of the Forest Policy 2030 on the sustainably usable wood volume in Switzerland's forests acts as a reference value for sustainable use.
	Round wood cutting from Swiss wood Source: FSO 2020	The development of the demand for wood products is reflected by the wood volume harvested from Swiss forests and cutting of round wood from Swiss forests.
3. Innovation secures the competitiveness of the forestry, timber and energy wood industry.	<ul style="list-style-type: none"> • Applied research and development projects • Product and process innovations • Technology development, Industry 4.0 • Pilot, demonstration and lighthouse projects for development of innovative technologies and solutions for the wood-based industry with market proximity • Patents, awards 	

Annotation: Increased use and application of Swiss wood is the focus of the wood resource policy. The data basis is being further developed to better map the share of Swiss wood in the various processing stages. The target indicators and sizes are adapted and specified accordingly.

Figure 7

Objective 1: Switzerland's final wood consumption and Swiss wood share of final wood consumption

Material use excluding paper and board in 1,000 m³.



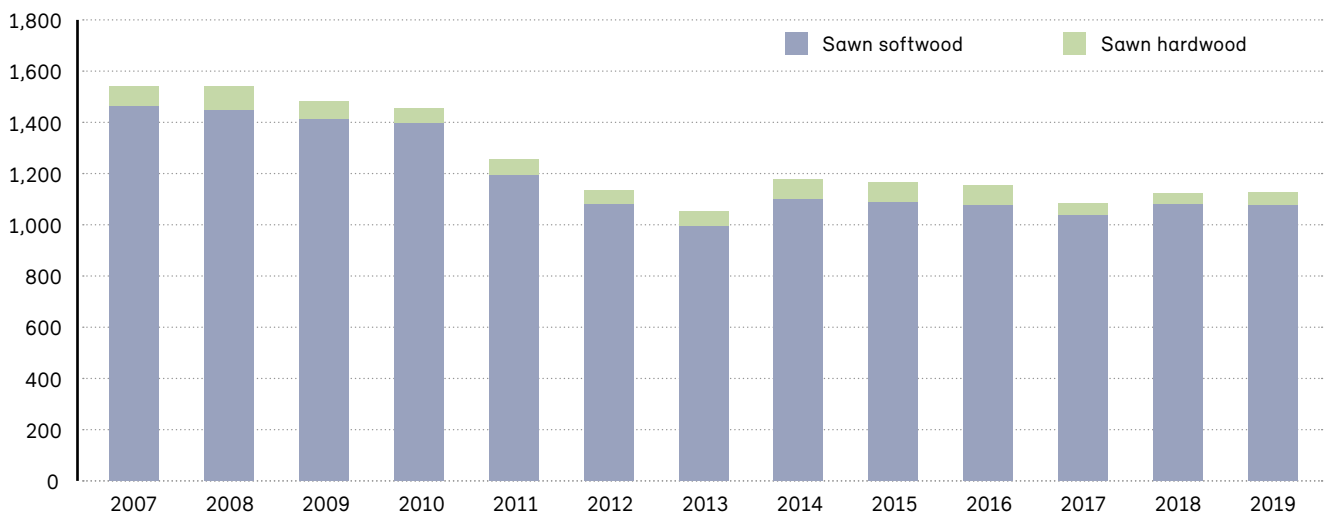
Source: Neubauer-Letsch et al. 2015

*2001: Study in the construction sector not comparable

Figure 8

Objective 1: Total sawn timber production in Swiss sawmills

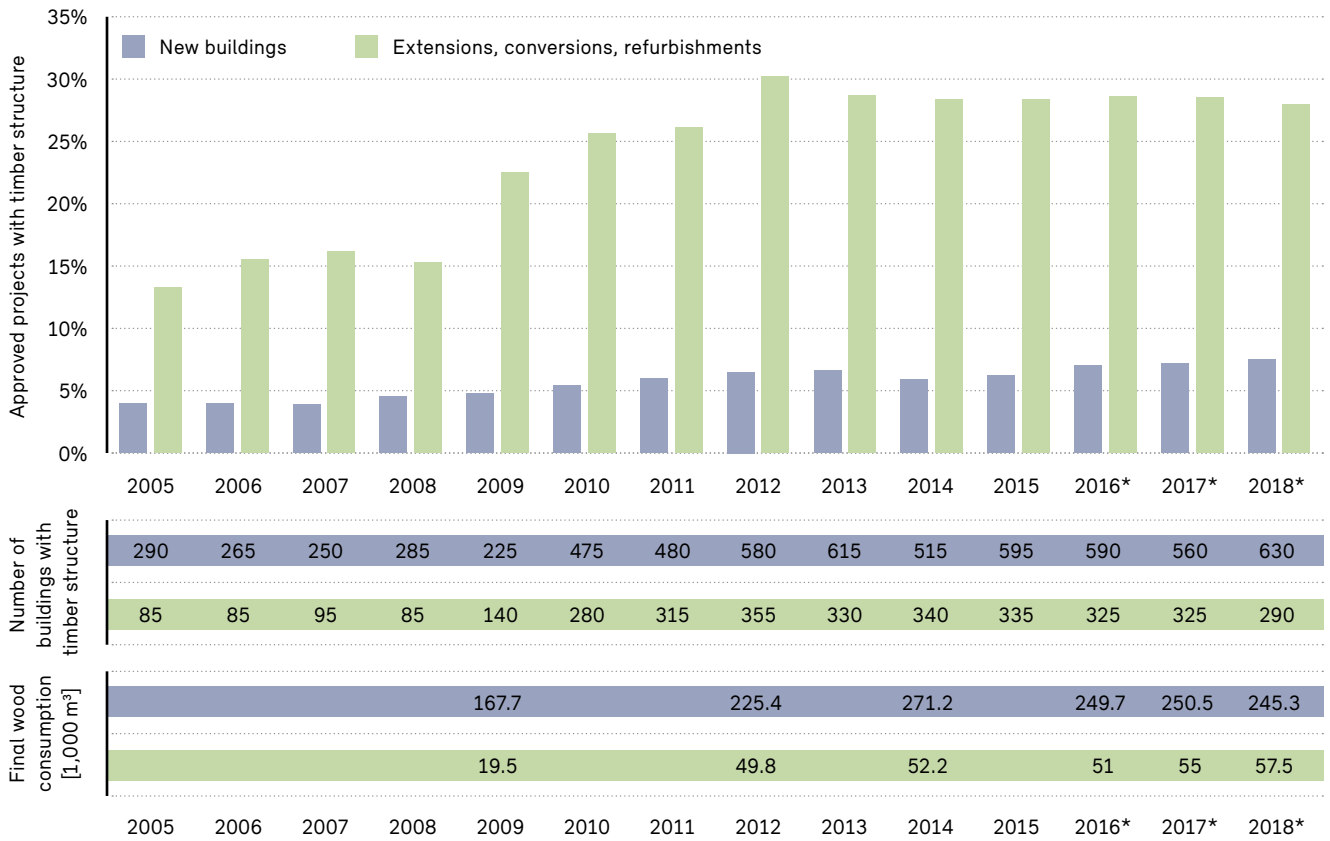
2007–2019 in 1,000 m³



Source: FSO 2020

Figure 9

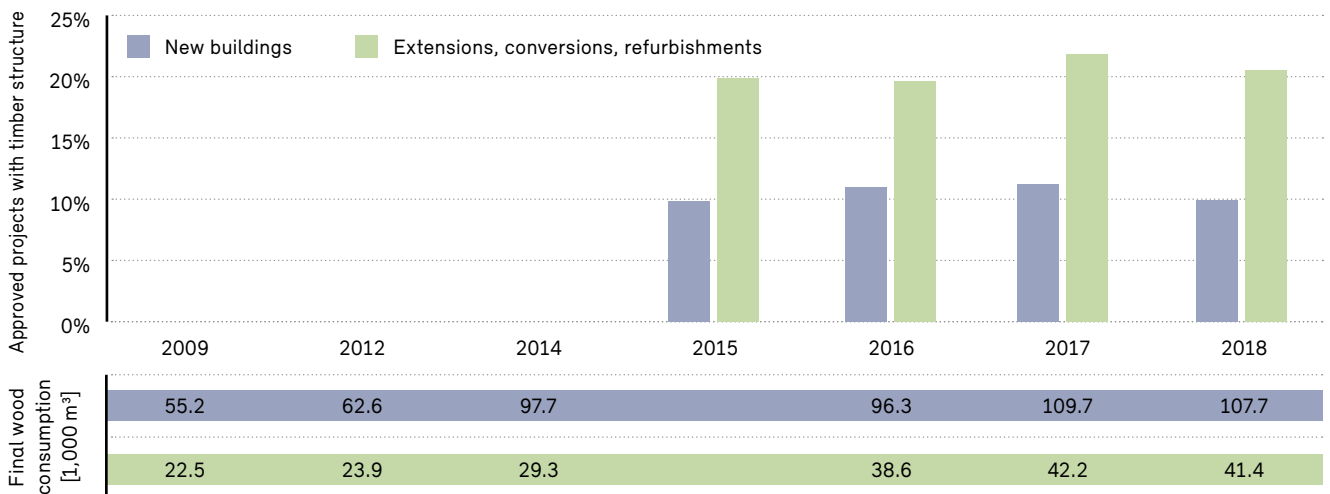
Objective 1: Wood share of multi-storey housing construction, Switzerland, 2005–2018



Source: Neubauer-Letsch et al. 2015
 * Excluding row houses (CRB 19)

Figure 10

Objective 1: Wood share of public buildings in Switzerland, 2005–2018

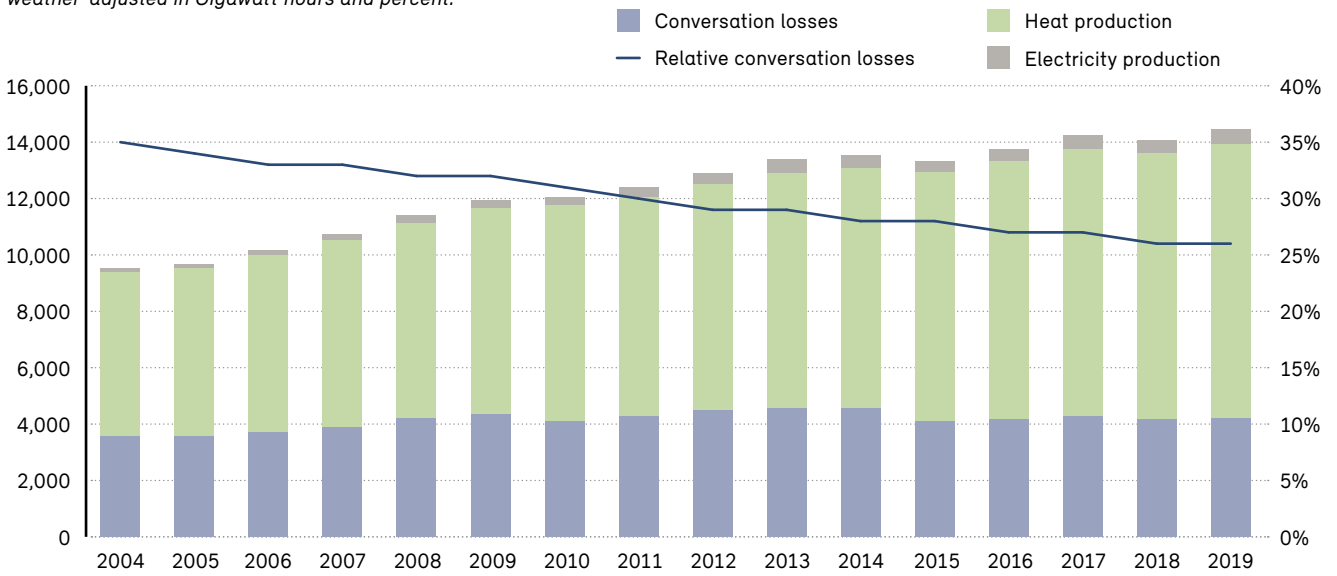


Source: Neubauer-Letsch et al. 2015

Figure 11

Objective 1: Sustainable energy wood harvest and efficient, environmentally-friendly wood use

Energy wood consumption, split between electricity and heat production and absolute and relative transformation losses, 1995 to 2019, weather-adjusted in Gigawatt hours and percent.

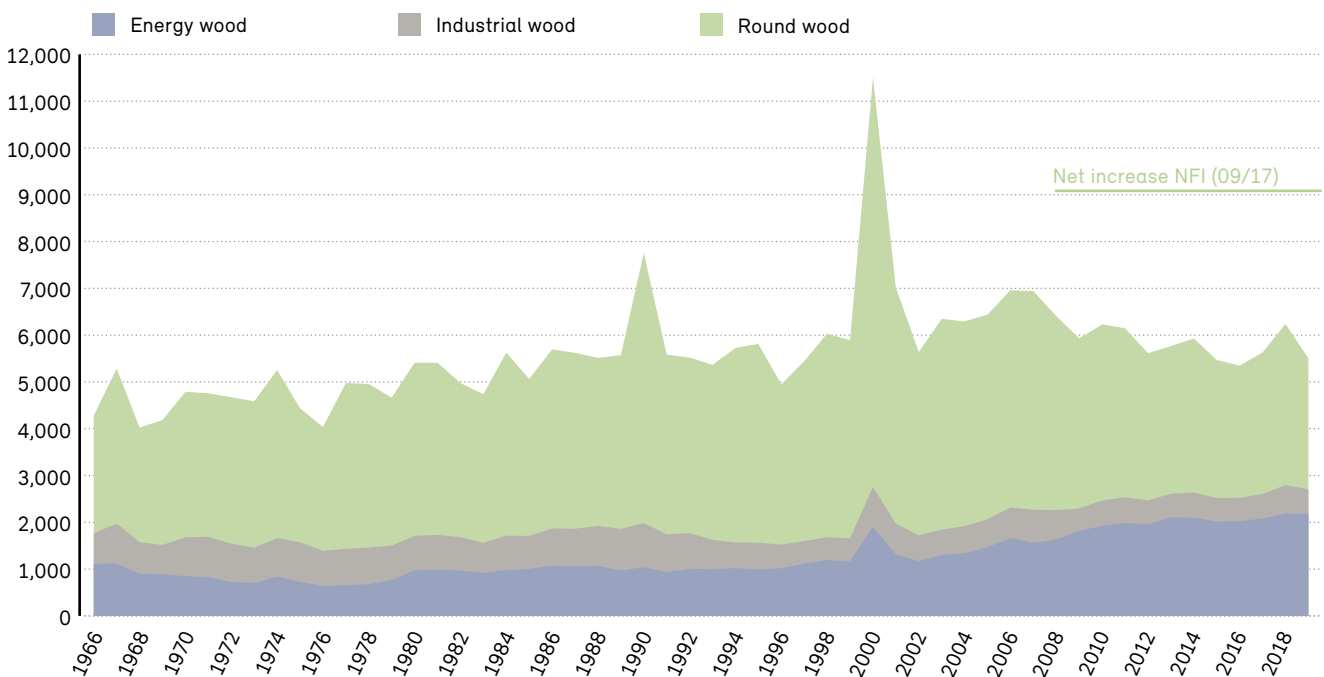


Source: FOEN 2020

Figure 12

Objective 2: Wood volume harvested from Switzerland's forests

Round wood, industrial wood and energy wood in 1,000 m³, 1966–2019



Source: FSO 2020. The wood harvest figures are extrapolated with adjustment factors (Hofer P. et al. 2011), as some wood harvest volumes are not covered by the forest statistics.

Annex 3 Selected projects in the Wood Action Plan 2017–2020

Fire safety and wood

From the beginning, the Wood Action Plan and earlier the holz21 promotion programme supported projects addressing adaptation of the fire regulations for wood construction, which in 2015 (BSV 2015) considerably extended the possible applications for wood. Since 2015, timber construction is possible for all building categories and uses. Technical and methodological principles for technically perfect implementation of the new uses in wood and safe designs for components in wood were formulated between 2017 and 2020.

The publications in the Lignum 'Fire Safety' documentation cover the options for wood use which result from the new regulations. There were four Lignum documents in total plus various events and articles on the subject.

Industry 4.0 and BIM in timber construction

The timber construction sector has already made great strides in digital transformation compared with other parts of the construction industry. Digitalisation will be established along the entire wood value-added chain, from the forest to timber construction business and from planning and tendering to harvesting and building. There were two projects on this subject.

The 'Forest & Wood Initiative 4.0' of the Bern University of Applied Sciences Department Architecture, Wood and Civil Engineering from 2017 to 2020 involves developments towards digital transformations jointly with professionals and interest groups.

The initiative promotes, monitors and supports the forestry and timber industry in the profound change brought about by the digital transformation.

Impacts and new business models are determined with selected specialists and leading figures from the forestry and timber industry and related and support sectors. The new instruments strengthen the enterprises and the entire value-added chain, the position of wood becomes more competitive and sales are increased.

The Lignum project *BIM Transformation and Parameters* generated information in BIM in an IFC file which meets international standards. The IFC file generator not only models in 3D, it also shows the properties of the product or component. The files are distributed through partner platforms such as CRB, build-up, eco-bau, etc.

Chemical use of wood

There were two studies on this subject.

The bwc project *Swiss Bioproduct Plant* (2018) created an overview of the requirements and feasibility of a bioproduct plant. Selected processes for wood pulping and splitting and the manufacture of regenerated fibres were presented. The processes pass through either cellulose, lignin, hemicellulose or a combination of these. By comparing the processes according to technical, environmental and economic criteria, their selection and the decision-making process for development of the requirements for a feasibility study are made easier. Three recommendations were issued, on pre-treatment of the raw material, wood pulping or splitting and further processing. The fibre model can be implemented short term. Adhesives, dispersants, foaming agents and cast resins and film for packaging etc. can be produced on this line. The technical evaluation is supplemented by the profitability and environmental compatibility assessment.

It is now possible to operate a bioproduct plant economically in Central Europe with wood defibring processes in plants producing 100,000 to 150,000 tonnes of cellulose annually.

The project *ExtraValBois* of Bern University of Applied Sciences Department Architecture, Wood and Civil Engineering (2018–2020) analysed business models for extracting and adding value to constituents from Swiss wood.

Various wood constituents are already obtained industrially by a separate extraction process and are marketed in established target markets with stable sales and revenue. As yet, however, consistently collected and therefore comparable data does not exist for the tree species indigenous to Switzerland on possible extract yields and the composition of the constituents, and nor do the necessary databases for discussion of possible business models.

It appears to be of interest to extend the value-added chain to cascade use, if regional and cluster-based cooperation generates innovative products with economic and ecological added value.

The analysis shows that raw materials for extraction are available in large quantities. The 2017 wood harvest yielded about 506,300 cubic metres of industrial timber, 1,801,000 cubic metres of energy wood and 357,000 cubic metres of bark, plus an additional 695,600 cubic metres or so of residuals in sawmills. These assortments are possibilities for extraction. The assortments of interest include spruce and silver fir bark and wood from oak, chestnut, Scots pine, larch and Swiss pine trees.

The calculations showed that great potential exists for extraction, particularly for the 'large sawmill', 'power generating plant' and 'extraction plant' business models.

Further development to industrial scale production requires new pilot plants to produce extracts from Swiss wood in sufficient quantities, under suitable process conditions and with consideration of upstream and downstream conversion steps. No infrastructure of this kind exists either in Switzerland or in neighbouring countries, but it could remove obstacles preventing large-scale implementation of extraction processes.

HARVE 'Wood Ash Recycling – Utilisation – Disposal'

Implemented by Holzenergie Schweiz and the Swiss Association for Environmental Technology (2017–2020)

On 1 January 2016, the Ordinance on Avoidance and Disposal of Waste (VVEA) entered into force. What is to be done with the 55,000 tonnes of ash generated annually by wood energy plants of over 50 kW which could previously also be used as fertiliser?

At the start of the project, little information was available on wood ash quantities, types and qualities.

The initial task was therefore formation of the most important bases to give the wood energy sector a clean and cost-effective means of disposal of wood ash of all types. To do this, the project first surveyed the mass flows and then produced a concept for economic, environmental and safe disposal of the wood ash. The work was carried out in close collaboration with plant operators, transport enterprises, landfill operators, users and enforcement authorities.

Raising the awareness of institutional clients

From 2017 to 2020 measures were adopted in four sub-projects to raise awareness among building investors about timber construction. With the 'City of Wood' series, the SIA publisher Espazium produced an annual special issue with a print run of 18,000 in the three national languages on timber construction. The content was also published digitally with additional technical articles and was included in the Newsletter and publicised. The property consultancy Wüest Partner continued the 'City of Wood' series of events launched in 2016 and looked to the future. Nine megatrends were highlighted at nine afternoon events in total and the opportunities and potential for timber construction in urban areas in the light of the megatrends were analysed by renowned international and Swiss experts and discussed with institutional clients. In parallel with these events and the special issues, Lignum arranged visits to selected timber buildings under the name Lignum Aspects. Based on eight multi-storey timber buildings, Wüest Partner instituted the project

Timber Construction Data for Investors, which will now be communicated jointly with Lignum and extended to commercial buildings if possible. Biel University supplied the overall design of the project and the *Evaluation*. Market information was updated as the basis for assessment of market developments in the housing (apartment buildings), commercial building and public building segments. It is clear that general acceptance of the use of wood in construction projects has increased significantly among investors in the last three years. The responses from those polled showed that the number of respondents who already had good experience with wood has doubled compared with previous surveys. The results of the final evaluation indicate that investors obtain their knowledge from site visits and specialist publications and events.

Raising the awareness of public sector clients

Article 34b of the Forest Act requires the Confederation to use sustainably produced wood in its own buildings. The KBOB, together with the FOEN and the Lignum Association, held a series of seminars to inform and raise the awareness of the building and property services (BLO) at federal and at cantonal, city and municipal level.

The participants were given an overview of the architectural and technical possibilities of modern timber construction. Building on the environmental assessment of wood as a material, the ecological credentials of timber buildings were demonstrated. Workshops on timber construction in competitions and sustainable procurement of wood rounded off the event. The various topics were backed up by many tools and recommendations, to support the participants with implementation of Article 34b in practice and therefore the increased use of wood: KBOB recommendations Wood in Public Procurement; wood calculators to determine the environmental impact of one cubic metre of processed wood and KBOB-BKB recommendations Sustainable Wood Procurement. By the end of 2020 Lignum developed a procedural concept on how the Regional Working Group can best be supported in its awareness raising with suitable services and products and other partners such as the VSLI can be integrated.

Raising awareness for Swiss wood

The target positioning of Swiss wood is based on the findings from neuroscience. They show that a purchase decision is generally a gut decision – even for industrial products. A product prepared with feeling appeals to investors. In partnership with the sector, the basis for a future campaign was developed under the name Swiss Wood Initiative. The campaign “#WOODVETIA – Action for more Swiss Wood” was then launched by a WTO tender procedure. Instead of traditional means of communication (and high media costs), the campaign worked with an emotional content concept in order to make a connection between the forests and the Swiss people, generate widespread reporting and attract a wide public. Twenty life-sized wooden statues of 20 important figures from all parts of Switzerland were created in 20 different types of wood. The regions and the sector were actively involved in the communication. The campaign achieved wide visibility and was given broad support by the sector. Such as on the Swiss Wood Days on 15 and 16 September 2017. Since 2018, Swiss wood has been advertised on around 1,000 posters displayed all over Switzerland. The posters show Swiss wood being highlighted by Gilberte de Courgenay (beech), Simon Ammann (spruce) and Dimitri (cherry).

From 2019 the Lignum and campaign websites were merged. With Swiss Wood Marketing, the sector brand was changed to Swiss Wood and a second campaign called Woodvetia – Land of Wood Diversity was launched.

Colleagues from the sector keep asking why the FOEN does not support the Swiss Wood brand directly with the Wood Action Plan, instead using Woodvetia in the campaign. The answer is simple: Brands cannot be promoted, because this would create a technical barrier to trade.

Annex 4 Political initiatives

In recent years there have been some political motions which have a bearing on wood as a resource:

- Motion 20.3745 (Daniel Fässler): Assuring the sustainable maintenance and use of the forests. Ongoing.
- Interpellation 20.3626 (Daniel Fässler): Why does armassuisse not implement the Forest Policy of the Confederation consistently? Ongoing.
- Motions 20.2495 (Jürg Grossen) and 20.3485 (Daniel Fässler): Biomass plants in Switzerland should not be at risk, they should be maintained and extended. Ongoing.
- Motion 20.3294 (Kilian Baumann): Sustainable forestry. Promotion of the protective function of the forests for people and climate by regional use of wood as a heat source. Ongoing.
- Interpellation 19.4440 (Isabelle Chevalley): Why are so many obstacles put in the way of wood-fuelled district heating? Completed.
- Motion 19.3277 (Erich von Siebenthal): Exploiting the potential of energy wood. Ongoing.
- Postulate 18.4060 (Maya Graf): Measures for future forest management in relation to the rapid advance of climate change. Ongoing.
- Motion 18.3963 and Interpellation 19.4176 (Daniel Fässler): Future of indigenous wood supply, processing and use. Abandoned.
- Motion 18.37.15 (UREK S): Implementation of the Forest Policy 2020. Relief on round wood storage. Accepted.
- Interpellation 17.4057 (Jacques Nicolet): Is the promotion of the new technologies for use of wood in construction adequate? Completed.
- Motions 17.3843 (Sylvia Flückiger-Bäni) and 17.3855 (Peter Föhn): Equal treatment for Swiss wood exporters with their European competitors. Abandoned with 18.095.
- Postulate 13.3924 (Erich Jans): Optimisation of forest use. Abandoned with 18.006.

Glossary

Assortment

Wood is basically divided into three types for sales: quality, strength and assortment. Classification by assortment is based on the purpose for which the wood is used. Three important categories are: > round wood, > industrial wood and > energy wood.

Biodiversity

Synonym for biological diversity. Diversity of habitats and ecosystems, species and genetic diversity, including all varieties of cultivated plants and livestock.

Bioeconomy (bio-based development)

The production of renewable biological resources and the conversion of these resources and waste streams into value-added products such as food, feed, bio-based products and bioenergy.

Biomass

All organic material produced directly or indirectly through photosynthesis that has not been altered by geological processes. This includes all secondary and ancillary products, residuals and waste, the energy content of which originates from the biomass.

Bioproduct plant

A bioproduct plant processes wood and the wood constituents cellulose, hemicellulose and lignin. It concentrates on the material use, has highly integrated and flexible operations and manufactures eco-friendly and naturally biodegradable products. It only produces energy, fuel, oil or gas in the sidestream or use cascade. It operates by mechanical, chemical, biochemical and biotechnological methods and aims primarily for maximum value added. It is based on the concept of decentralisation and individualised production. Its operations are energy positive and carbon neutral.

Building

Structures that can be classified as residential, commercial and public are defined as buildings.

Building Information Modelling BIM

BIM uses digital models of a structure for standardised acquisition and administration of the information and data relevant to its life cycle and their exchange among the parties involved. BIM is the implementation of Industry 4.0 in the construction industry.

Cascade use

Strategy of using raw materials or products manufactured from them as long as possible in the economic system. Use cascades are passed through in the process, which lead gradually from the high value-added level to lower levels. With cascade use, overall value creation is increased and the environmental effect further improved. In the area of renewable raw materials, cascade use can take place in two ways:

- Biomass is used first on a material basis, possibly via several use phases or products, and then used energetically at the end of the product cycle.
- Biomass is used first on a material basis, possibly through several use phases or products, and then used on a compound material basis. Following one or more use cycles, it may then be used for energy purposes.

Both options can be implemented jointly or overlapping in a chain (coupled use). (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz 2008)

Conversion losses

Losses arising in the conversion of one type of energy to another.

CO₂

CO₂, or carbon dioxide, has a major role in the metabolism of plants. In photosynthesis it is converted into oxygen and sugar (glucose) under the action of sunlight and water. CO₂ is a greenhouse gas which significantly affects the Earth's climate due to the greenhouse effect.

Cubic metre

The cubic metre is the unit of measure for volume in the International System of Units (SI) and usually designated using the unit symbol m³. A cubic metre corresponds to the volume of a cube with an edge length of 1 metre. Cf. solid cubic metre.

Damaged wood

Impairment of the forest caused by biotic factors (e. g. bark beetles) or abiotic factors (e. g. storm, heat, drought), resulting in the death of trees or a massive loss in their vitality, productivity or value.

Deadwood

Dead trees or parts of trees of varying quality and dimensions.

Ecosystem

Dynamic functional unit consisting of all living organisms together with their habitats. The organisms interact with their surroundings (soil, water, air, competitors, harmful organisms etc.) and exchange energy, material and information.

Embodied energy

Amount of energy required to produce, transport, store, sell and dispose of a product. It takes into account all of the input materials required, including their extraction, and the energy used in all of the production processes involved. Embodied energy is, therefore, the indirect energy needed to produce a consumer good or service as opposed to the direct energy consumed when the product or service is used.

Energy wood

Wood that can be used to generate energy. It is classified according to its origin: > forest wood > woodland fragments > residuals (from wood processing), plantation wood and > waste wood

Extension/conversion of buildings

For example, extensions, addition of floors and the refurbishment and retrofitting of buildings.

Final wood consumption

Final wood consumption is the market volume of wood products that do not undergo further processing and are used or consumed in different areas of application.

Forest and wood value-added chain

Process chain of traditional stakeholders in the forestry, timber and energy wood industry that encompasses the

value added generated by the individual production stages from wood harvest to final consumption.

Forest and wood value-added networks

Vertical and horizontal business, cooperation and production models which go further than the stakeholders in the traditional value-added chain to promote the use of Swiss wood in all areas of application.

Forest functions

Tasks performed exclusively or in part by forests, or which could or should be performed by forests. Important forest functions in Switzerland include: natural hazard protection, timber production, > biodiversity, recreation, drinking-water protection, and the filtering of the air.

Forest wood

All wood grown, produced and harvested in the forest.

Forestry enterprise

An organisational unit is classified as a 'forestry enterprise' for statistical purposes (Swiss forest statistics and forestry test enterprise network) if it meets the following three criteria: 1. Property or disposal rights over managed forest, 2. Minimum productive forest area (Jura ≥ 200 ha, Central Plateau ≥ 150 ha, Prealps ≥ 250 ha, Alps and south side of the Alps ≥ 500 ha) and 3. Consolidated financial statements (additions of individual statements are possible, financial or business accounting).

Greenhouse gases

Greenhouse gases (GHG) are gases in the atmosphere that absorb and emit radiation, contribute to the greenhouse effect and can be both natural and anthropogenic in origin.

Growing stock

Synonym for wood stock. According to the > NFI, this is the volume of > round wood with bark of all living trees and shrubs (standing and lying) exceeding 12 centimetres in diameter at breast height in a stand or area. The NFI also includes all dead trees, both lying and standing, in the total wood volume. The growing stock is usually specified in cubic metres of wood per hectare of forest.

Increment

Increase in diameter, height, circumference, basal area, volume or value of a stand or individual tree within a defined period of time.

Gross increment: Increase in the round wood volume (> round wood) of trees. In the > NFI, increment refers to the increase in the round wood volume of all living trees, the round wood volume of all newly recorded (ingrowth) trees, and the modelled increase in the round wood volume of all used trees or dead trees.

Net increment: Gross increment minus the natural mortality (e. g. > deadwood).

Industrial wood

Raw wood that is mechanically shredded or chemically pulped. It is used to produce pulp wood, cellulose, wood shavings, particle- and fibreboard, as well as other industrial products.

Industry 4.0

The interconnection of industrial production with modern information and communication technology. This should help to optimise the self-organisation of production: with Industry 4.0 people, machines, plants, logistics and products cooperate directly with each other. The networking makes it possible to optimise not just individual production phases but entire value creation chains. Moreover, the data cover all phases in the lifecycle of a product – from its conception to its development, production, use, maintenance and recycling. BIM is the implementation of Industry 4.0 in the construction industry.

Large dimensioned timber

Normally over a diameter at breast height DBH of 50 cm or even 40 cm.

National Forest Inventory NFI

Sampling inventory of roughly 6,500 sample plots. The NFI periodically records the condition of Swiss forests and any changes that have taken place in them. Based on these data, statistically reliable conclusions can be drawn for all of Switzerland and for the larger cantons and regions. The first inventory (NFI1) was carried out in 1983–1985, the second (NFI2) in 1993–1995 and the third (NFI3) in 2004–2006. Since 2009, the data have been continuously collected, and one ninth of the sample plots throughout

the country are surveyed each year. The primary sources of data are aerial images, data collected in forests and surveys carried out by the forest service.

Natural resources

Natural resources are raw materials provided by nature. They are often classified as renewable and non-renewable resources. Renewable resources can regenerate within the timeframe of human decision-making processes, also without targeted human intervention (e. g. fish, forests, water). Non-renewable resources form a definitive total stock across all generations (e. g. oil, copper, aluminium).

Precompetitive

Without influence on competition or favouring individual actors. This includes, in particular measures in the area of research and development, from which an entire sector can benefit.

Product platforms

A platform is a product which is used as the basis for designing more complex products. A bioproduct plant builds on the most complete possible material use of the three main constituents of wood. The selection available is uses from the three product platforms lignin, cellulose and hemicellulose.

Regeneration

Establishment and growth of young trees. Regeneration that takes place without human involvement is called natural regeneration. Regeneration can be promoted through silvicultural measures or through targeted human intervention (e. g. planting). The Swiss forests generally regenerate naturally.

Residuals

Forest residuals: Part of timber harvest that cannot be used as > round wood, i. e. stems and branches that do not have the lengths and diameters required for the round wood assortment, and brushwood. It can be used as a material (rare) or to produce energy.

Industrial residuals/Sawmill residues: Production residues such as wood shavings and sawdust from wood processing, for example, in sawmills, planing mills and carpentry workshops. Used both as a material and for energy production.

Resource economics

Resource economics studies the optimum extraction and consumption of natural resources over time.

Resource efficiency

The ratio of a specific benefit to the natural resources required to produce it. The benefit may be provided in the form of a product or a service. The lower the input of natural resources or the higher the benefit provided by the product or service, the greater the resource efficiency.

Resource policy

The FOEN uses the term resource policy synonymously with environmental policy. According to the FOEN, a resource policy controls the access to natural resources and hence also their consumption.

Resource productivity

Resource productivity expresses the (volume) ratio of products (output) to the resources used (input) in their production process.

Round wood

Cover term for the raw and unworked wood produced in the forest during > harvesting in the form of > round wood logs, > industrial and > energy wood. A distinction is made between broadleaf and conifer round wood according to the tree species.

Sawn timber

Products produced in sawmills by cutting > stemwood (lumber); they include boards and battens for the construction, packaging and furniture industries.

Sequestration

Sequestration means storage of carbon dioxide in the forest by photosynthesis. CO₂ can be stored in timber products.

Solid cubic metre

Unit of measure for > round wood. A solid cubic metre (scm) corresponds to one cubic metre of solid wood mass, usually without bark. This unit of measure is used in the harvesting and sale of round wood.

Stemwood

Above-ground wood of the tree stem (excluding branches but including bark).

Stemwood logs

The more valuable > round wood that can be used as sawnwood or veneers. Normally in the form of > stemwood.

Substitution

Replacement of a material with another.

Sustainability

The term sustainability was coined in the forestry industry. It originally meant "Never harvesting more than the forest can yield in regrowth". In the Brundtland Report of 1987, sustainability was defined as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs". In order to achieve this, the three dimensions of sustainable development – environmental responsibility, social solidarity and economic efficiency – must be taken into account in a homogeneous, integrated and balanced way.

Sustainable Development Goals (SDG's)

The 17 goals for sustainable development with their 169 sub-goals are the core of Agenda 2030. They take the economic, social and environmental dimension of sustainable development into account in a balanced way and combine combating poverty and sustainable development in one agenda for the first time. The Sustainable Development Goals (SDGs) are to be achieved globally and by all UN Member States by 2030.

Swiss wood

Wood from Switzerland's forests is Swiss wood. The Swiss Wood brand is used by the sector for wood and timber products in the different processing stages according to defined principles.

Value added

Gross value added: Gross value added is calculated by subtracting preliminary outlay, that is the goods and services consumed, processed or transformed during the production process, from the gross production value.

Gross production value: Total value of all goods and services produced in a country over the course of one year.

Waste wood/used wood

Wood that has already been used for a particular purpose and is available for a subsequent use cycle. This includes, for example wood recovered from the demolition of buildings or disposal of furniture and packaging. Depending on its origins, waste wood is left in its original state or treated.

Wood harvest/use

Trees that are felled, including all wood removed from the forest and made available for use or processing.

Wood harvesting potential

Volume of wood theoretically available for harvesting in Swiss forests annually, based on different forest management scenarios when different factors like societal demands and forest services (reserves, recreation, protective forest) and economic factors (wood prices, harvesting costs) are taken into account).

Wood processing

Round wood from forests or outside forests that is made available for processing, for example cut to produce sawn timber in sawmills or processed for the production of paper.

Wood supply

Includes timber harvesting and supply up to the purchaser.

Wood use

Round wood from forests or outside forests which is used for material or energy purposes.

Material use: that is not used to generate energy, e. g. in timber construction, for furniture and interiors, packaging, fibre production for paper, textiles and chemical use for basic substances in the pharmaceutical industry

Energy use: wood used for the production of heat, electricity or fuel.

Woodland fragments

Wood which grows outside the forests in open country, such as wood from fields, bushes and hedges, orchards, gardens, etc. Wood growing on the edges of transport infrastructure, for example, motorways, is often considered as woodland fragment. Another term is landscaping wood.

Woody biomass outside forests

All the wood harvested outside the forests from landscape management, farmland, gardens, cities etc..

Woodvetia

Campaign for Swiss wood financed by the FOEN and the sector as part of Swiss wood marketing.

Acronyms

3D

Three-dimensional

ARE

Federal Office for Spatial Development

BFH

Bern University of Applied Sciences

BIM

Building Information Modeling

CO₂

Carbon dioxide

CRB

Building standards

ERA-NET

European Research Area Network

EUTR

European Timber Regulation

FAC

Federal Office for Culture

FOAG

Federal Office for Agriculture

FOBL

Federal Office for Buildings and Logistics

FOE

Federal Office of Energy

FOEN

Federal Office for the Environment

FOH

Federal Office for Housing

ForA

Federal Act on Forest

FPC

Federal Procurement Conference

FSO

Federal Statistical Office

GDP

Gross Domestic Product (GDP) is the sum of the market value of goods and service produced in the economy.

IFC

International Foundation Class

Innosuisse

Swiss innovation agency

KBOB

Coordination Conference of Building and Property Bodies of Public Sector Developers

MFD

Multi-family dwellings

NFI

Swiss National Forest Inventory

NRP

National Research Programme

OAPC

Ordinance on Air Pollution Control

PPA

Federal Act on Public Procurement

SDG's

Sustainable Development Goals

SECO

State Secretariat for Economic Affairs

SFOE

Federal Office of Energy

SIA

Swiss Society of Engineers and Architects

SPA

Federal Act on Spatial Planning

SNBS

Swiss sustainable building standard

TWh

Terawatt hours

UNO

United Nations

VVEA

Ordinance on Avoidance and Disposal of Waste

WAP

Wood Action Plan

WRP

Wood Resource Policy

WSL

Federal Institute for Forest, Snow and Landscape
Research

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