> Wood Resource Policy

Strategy, Objectives and Wood Action Plan

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> Abstracts

The aim of the Wood Resource Policy is to ensure that wood from Swiss forests is supplied, processed and used in a way that is sustainable and resource-efficient. In doing this, it makes a major contribution to forest, climate and energy policy. The Federal Office for the Environment (FOEN) is the lead agency for this policy and coordinates it with the relevant partners. With its three priority areas of 'optimised cascade use', 'climate-appropriate building and refurbishment' and 'communication, knowledge transfer and cooperation', the Wood Action Plan serves the implementation of the Wood Resource Policy.

Keywords:
Wood Resource Policy, Wood Action Plan, sustainable wood supply, resource-efficient wood use, cascade use, innovation, forest and wood value-added chain

Die Ressourcenpolitik Holz hat zum Ziel, dass Holz aus Schweizer Wäldern nachhaltig und ressourceneffizient bereitgestellt, verarbeitet und verwertet wird. Sie leistet damit einen grossen Beitrag an die Wald-, Klima- und Energiepolitik. Das Bundesamt für Umwelt (BAFU) hat die Federführung für diese Politik inne. Sie ist mit den Partnern abgestimmt. Zur Umsetzung dient der Aktionsplan Holz mit den drei Schwerpunkten «Optimierte Kaskadennutzung», «Klimagerechtes Bauen und Sanieren» sowie «Kommunikation, Wissenstransfer und Zusammenarbeit».

Stichwörter:
Ressourcenpolitik Holz, Aktionsplan Holz, nachhaltige Holzbereitstellung, ressourceneffiziente Holzverwertung, Kaskadennutzung, Innovation, Wertschöpfungskette Wald und Holz

La politique de la ressource bois veut promouvoir un façonnage, une transformation et une valorisation du bois issu des forêts suisses qui soient durables et efficaces en matière d'utilisation des ressources. Elle apporte une contribution substantielle à la politique forestière et aux politiques climatique et énergétique. Placée sous l'égide de l'Office fédéral de l'environnement (OFEV), elle est élaborée en concertation avec les partenaires concernés. Elle est mise en œuvre dans le cadre du plan d'action bois, qui est centré sur trois priorités : « utilisation en cascade optimisée », « construction et assainissement respectueux du climat » et « communication, transfert de connaissances et collaboration ».

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, chaîne de création de valeur de la forêt et du bois

La politica della risorsa legno ha lo scopo di rendere disponibile, trasformare e valorizzare il legno dei boschi svizzeri in modo sostenibile ed efficiente. Fornisce pertanto un contributo significativo alla politica forestale, climatica ed energetica. L'Ufficio federale dell'ambiente (UFAM) guida, in coordinamento con i partner, la politica della risorsa legno e la attua con il cosiddetto piano d'azione Legno, che pone l'accento sui tre punti chiave «Utilizzazione a cascata ottimizzata», «Costruzioni e risanamenti rispettosi del clima» nonché «Comunicazione, trasferimento di sapere e collaborazione».

Parole chiave:
politica della risorsa legno, piano d'azione Legno, utilizzazione sostenibile del legno, valorizzazione efficiente del legno, utilizzazione a cascata, innovazione, filiera bosco-legno

> Foreword

Wood is one of Switzerland's most important natural resources. It makes a positive contribution to the resolution of the challenges currently facing our society, for example climate change, sustainable building and the strengthening of regional development in Switzerland. For this reason, through the Wood Resource Policy, the Swiss Confederation has been committed to ensuring the sustainable supply and efficient use of wood from Switzerland's forests since 2008.

Since the adoption of the Forest Policy 2020 by the Federal Council in 2011, greater emphasis has been placed on the use of the raw material wood supplied by Switzerland's forests. This approach is supported by the strategic thrust of the Wood Resource Policy, which aims to increase the demand for products made from Swiss wood – using measures suited to a liberal market economy. The Wood Resource Policy also supports federal climate policy as the large-scale replacement of emissions-intensive construction materials with materials made from indigenous timber has a positive impact on Switzerland's climate balance. The public sector has an important role to play here as it defines building standards, formulates procurement guidelines, commissions construction projects and sets an example as a construction client.

The use of wood from Swiss forests also supports the objectives of the new energy policy, which aims to increase the use of renewable energy sources. Because Switzerland's forestry and timber industry is an important economic factor in the rural and mountain regions, increased wood harvesting and processing is also in tune with the new regional policy.

The Wood Action Plan is the most important policy instrument for the implementation of the Wood Resource Policy. Over 200 projects have already received support under the Plan since 2009. The evaluations of the two previous programme phases, 2009–2012 and 2013–2016, also show that the Wood Action Plan made a substantial contribution towards attaining the objectives of the Wood Resource Policy. Moreover, the evaluations highlight the fact that the Policy's concerns require continuity of implementation. The key partners agree with these assessments. They stress that the support of the federal authorities has provided positive and, indeed, crucial impetus up to now, for example with regard to innovations for fire and noise protection measures in timber construction. However, all of the objectives have not been completely fulfilled, which is why the Wood Action Plan is being extended until 2020.

We firmly believe that the Wood Resource Policy and the Wood Action Plan make important contributions to Switzerland's climate and energy policy and to the new regional policy by supporting the sustainable harvesting and use of Swiss wood. The fact that their implementation is understood as a joint, partnership-based task involving, in particular, the participating federal authorities, the Swiss forestry and timber sector and the cantons, remains a crucial aspect of the process.

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the Environment FOEN	of Energy SFOE	Directorate SECO

Wood harvesting in the mixed beech forest in the Tösstal valley (Zurich): Swiss wood is valuable. It grows naturally without fertilisers and is harvested in a way that conserves and protects the forest.

> Summary

Positioning

With the Wood Resource Policy, the Swiss Confederation formulates a separate action programme, which is coordinated with the Forest Policy 2020, climate policy, energy policy and regional policy. As the lead agency in this process, the Federal Office for the Environment actively promotes the cooperation with these sectoral policy areas, with the Swiss forestry and timber sector, and with the cantons.

Vision

The Wood Resource Policy presents a picture, in which wood is a characteristic component of Switzerland's architectural and living culture and improves the quality of life here. Thanks to high innovation capacity, Switzerland's forest and wood value-added chain is internationally competitive.

Main objective

The main objective states that wood from Swiss forests is supplied, processed and used in a way that is sustainable and resource-efficient. This enables the resource policy to make a major contribution to forest, climate and energy policy.

Objectives of the Wood Resource Policy

Four policy objectives are defined in the Wood Resource Policy 2017–2020.

1. The wood harvesting potential of the Swiss forests shall be exploited sustainably by an efficient Swiss forestry sector.
2. Demand for material wood products in Switzerland shall increase, particularly for those produced using wood from Swiss forests.
3. Energy wood shall be sustainably harvested and used in a way that is efficient and environmentally friendly.
4. The innovative capacity of the forest and wood value-added chain shall increase.

Wood Action Plan

These objectives are implemented in particular through the Wood Action Plan. Over 200 projects, which contributed to the fulfilment of the programme objectives, were already been implemented between 2009 and 2016.

Priority areas

For the 2017–2020 programme phase, the Wood Action Plan is focussed on three priority measures:

1. Optimised cascade use
2. Climate-appropriate building and refurbishment
3. Communication, knowledge transfer and cooperation

Organisation

The FOEN manages and controls the Wood Action Plan. An advisory committee comprising representatives of the Swiss forestry and timber sector, the cantons, other federal authorities, nature conservation organisations and the property sector provides guidance on strategic issues.

Wood storage of a sawmill in Rueyres (Vaud): In Switzerland the distance from the forest to the sawmill is short, reducing transport and saving fuel.

> Useful information

Switzerland's forests …

> cover one third of the country's territory
> consist of over 500,000,000 trees
> grow by an area equivalent to the size of Lake Thun annually
> protect built-up areas and transport routes with over half of their area
> provide habitats for around 20,000 animal and plant species
> clean and store around 40 % of the country's drinking-water
> produce over one cubic metre of wood for each inhabitant annually
> are visited and treasured by 90 % of the population
> reduce the blood pressure of every person who stroll through them

Swiss wood …

> flourishes naturally without any fertiliser
> grows to the size of a metre-long cube in three seconds
> 10,000,000 of these cubes are produced annually and could fill the St Jakob football stadium in Basel to the roof ten times
> store around one tonne of CO_2 per cubic metre
> reduces Switzerland's CO_2 emissions by 2–3 million tonnes annually when other materials for construction purposes or for energy are replaced
> remains more structurally stable than steel or reinforced concrete at high temperatures (e.g. in the case of fire)
> fulfills its purpose as a construction material for many centuries if correctly used
> replaces 200 to 300 litres of light heating oil when used in the form of one cubic metre of energy wood
> supplies 11 % of the heat energy generated in Switzerland
> is the main source of income for the domestic forestry sector

The Swiss forestry and timber sector …

> employs around 80,000 people, many of them in peripheral regions
> genates approximately CHF 6,000,000,000 in added value annually
> provides around 10,500 apprenticeships across 20-plus different professions

Softwood processing in a sawmill (Schwyz): Switzerland's sawmill industry processes almost exclusively stems from the country's own forests.

> Introduction

With wood, Switzerland has access to an important natural resource: it is a renewable climate-neutral and natural product, which can be used for both material applications (construction materials, paper/cellulose, chemicals) and as an energy source (heat, electricity, fuels). Wood could also assume greater importance in the future as a source of carbon for the chemical and pharmaceutical industries.

Due to growing prosperity, the pressure on the use of natural resources is increasing at both national and international levels – as is the population's need for intact natural living resources, security and good health. The purpose of a resource policy is to support the optimum use of resources. The FOEN uses the term "resource policy" synonymously with the term "environmental policy". The Wood Resource Policy formulates guard-rails for the sustainable harvesting and efficient use of the raw material wood while taking different interests in relation to the forest, climate and energy policy goals, and economic concerns into account.

The standing volume in Switzerland's forests is increasing constantly. The reasons for this include the country's small-scale forest ownership structure, the supply behaviour of forest owners, the high harvesting costs arising from the nature of the forest terrain and the weak demand for certain assortments, in particular hardwood logs. Making optimal 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 coordination with the relevant sectoral policies and the forestry and timber sector. It was updated in 2013 and 2016.

Since 2009, the Wood Resource Policy has been implemented through the Wood Action Plan. The priority here is on the ecologically and economically expedient use of wood. Cascade uses, 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 that would be necessary to enable seamless cascade use. In the case of energy use, the aim is to achieve greater overall efficiency.

The evaluations carried out towards the end of the two programme phases (2009–2012, 2013–2016) and the feedback received from the relevant actors show that the objectives defined for the Wood Resource Policy were the right ones. The implementation of these objectives is contributing to the resolution of current social-policy challenges, that is in relation to Switzerland's climate, energy and regional policies. The Wood Action Plan will be continued for another four years with more strongly focussed priority areas (2017–2020).

New library for the commune of Spiez (Bern): the public sector sets an example in making use of the regionally produced building material timber and conserves jobs in the region.

1 Positioning

Legal basis

The revised Forest Act (SR 921), which has been in force since 1 January 2017, provides the legal framework for the Wood Resource Policy. This policy and its implementation are based, in particular, on Art. 34a on the sale and use of wood: "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, system boundaries and policy interfaces

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 coordination with the relevant actors. These include, in particular, the Swiss Federal Office of Energy SFOE, the State Secretariat of Economic Affairs SECO, the Swiss forestry and timber industry, the cantons, the relevant universities, the property sector and the environmental associations.

The Wood Resource Policy is an independent use-oriented policy. It presents numerous overlaps with other sectoral policies (cf. Fig. 1). It is most closely associated with the Forest Policy 2020 and is tailored to its objectives. The system boundaries of the Wood Resource Policy extend from the forest as the supplier of the resource, along the entire wood value-added chain, through the various processing phases to its use (final material consumption) – including recycling or energy use at the end of the use path (cycle).

Combined with the other forest functions, the use-oriented approach of the Wood Resource Policy is intended to make the maximum possible contribution to the following sectoral policies:

> *Climate and energy policy:* both of these policies aim to increase energy efficiency and the proportion of renewable climate-neutral energy sources used. The renewable and climate-neutral construction material wood supports the aims of both policies in the key sector of buildings, particularly through embodied energy, the energy efficiency of building systems and greenhouse gas emissions. A lot of energy-efficient buildings are constructed in timber or with timber wall and roof elements, as these enable the use of almost the entire wall and roof thickness for insulation purposes.
> *New regional policy:* This is aimed at improving competitiveness and value-added in rural areas and mountain regions, in particular those in which the forestry and timber sector represent an important economic factor.
> *Sustainable Development Strategy 2016–2019:* The Wood Resource Policy contributes to the following action areas named in the strategy: consumption and production, urban development, energy and climate, natural resources.
> *Spatial planning policy:* This aims to achieve "inward settlement development" characterised by greater built density, particularly in cities and urban agglomerations. As a light and flexible building material, wood and prefabricated timber construction systems are ideally suited to this task.
> *Waste policy and air pollution control:* The Wood Resource Policy is linked to federal waste policy through the aim of keeping wood in the material cycle as long as possible. The regulations relating to air pollution control apply when wood is used to generate energy at the end of its material use.

The Wood Resource Policy can also make notable contributions to the current issues of the green economy and clean technology (cleantech). Other interfaces involve public procurement (KBOB and BKB). With regard to timber trading, Switzerland is seeking a follow-on solution to the European Union Timber Regulation EUTR. An independent Compulsory Declaration for Wood and Wood Products has existed in Switzerland since 2010. The Wood Resource Policy is also linked to the National Economic Supply, which ensures the supply of energy in times of crisis.

With regard to research and development R & D, results from National Research Programme NRP 66 "Resource Wood" are also incorporated into the Wood Action Plan as points of contact for application-oriented projects. The Commission for Technology and Innovation CTI supports and promotes networking among Swiss research institutes and companies in the context of the European Research Area Network ERA-NET.

Fig. 1 *Embedding and boundaries of the Wood Resource Policy*

2 Context

The forestry and timber sector make an important contribution to the decoupling of economic growth and CO_2 emissions. Durable wood products boost the CO_2 sink effect of the forest, and fossil fuels are substituted by the climate-neutral energy use of wood. Both of these effects contribute to reducing the concentration of CO_2 in the atmosphere.

Switzerland's forestry and timber enterprises are under severe pressure from foreign competition. Due to different operating conditions in other countries (in particular currency advantages, industrial land reserves and prices, transport costs, and subsidies), production costs are usually cheaper abroad. Swiss enterprises respond to this challenge by implementing rationalization measures and by making new or replacement investments. The low euro-franc exchange rate is both a blessing and a curse: while the export-oriented branches of the sawn timber, derived timber products and paper industry are under severe pressure, other areas benefit from the low euro exchange rate thanks to lower advance foreign payments.

The strengths of the Swiss timber industry include its culture of innovation, high level of wood-engineering expertise and strong customer-orientation. The wood harvesting potential of Switzerland's forests represents an opportunity for the country's forestry sector. To make better use of this potential and capitalise on the economic advantages of wood, a closed value-added chain from the forest to the consumer would be advantageous and would also reduce the emissions transfer to locations abroad.

Against the background of wide-ranging social expectations (i.e. use of the resource wood, protection against natural hazards by forests, and the provision of leisure and recreation services by forests), Switzerland's forestry enterprises basically face an enormous challenge in their attempts to operate profitably. In the mostly public forests, political influence also contributes to the fact that they cannot be managed in a way that covers their costs. In many cases, the staffing, equipping and structuring of communal forestry operations are not based on management considerations and business-oriented action alone. The owners of small forest areas are particularly sensitive to price fluctuations and only harvest their resource if, at least, the associated costs are covered. However, even the harvesting of these very small areas can produce profit through closer cooperation between enterprises and the use of more rational forest management and wood harvesting methods.

3 Vision

The vision for the forest and wood value-added chain formulated in the Swiss National Forest Programme (Swiss NFP) of 2004 provides an important basis for the vision of the Wood Resource Policy. It also draws on the vision of the 2000 Watt Society, which suggests that Switzerland's primary energy consumption could be reduced by more than half. Absolute per-capita consumption has been declining since 2005 while the proportion of renewable energy sources used, including wood, has increased. The resource wood makes important contributions to the objective of a 2000 Watt Society.

Wood is a formative element of Swiss architectural and living culture and of the country's quality of life. The forestry and timber sector makes an important contribution to the Swiss Confederation's forest, energy, climate and resource policy objectives. Thanks to high innovation capacity, from the tree to the end product, the wood value-added chain is internationally competitive, socially viable and environmentally friendly. The resource wood is used on a cascade and multiple basis.

Timber dome of the Riburg salt works (Aargau): this timber dome, the largest of its kind in Europe, showcases the innovative strength of Switzerland's timber sector.

4 Main Objective

Forest management, climate and energy policy goals and strategies, and the general market-economy conditions are crucial issues when it comes to fulfilling the objective of the Wood Resource Policy.

The aim of the Wood Resource Policy is to ensure that wood from Swiss forests is supplied, processed and used in a way that is sustainable and resource-efficient. In this way, it makes the maximum possible contribution to forest, climate and energy policy.

The forestry sector operates on a long-term basis. This means that making decisions about the future composition of forests today poses a challenge: desirable characteristics include an optimal mix of coniferous and deciduous species, qualities and assortments and continuous forest regeneration, which gives rise to an age mix that is well adapted to climate change.

Providing a sustainable wood supply means ensuring that this process is economically viable and environmentally-friendly, the productivity of individual locations is maintained, and the forest continues to provide all of its legally-defined functions. Wood is used in a resource-efficient way if the maximum possible value-added is generated and the negative environmental impacts along the entire use cycle are minimised. The cascade use of the raw material shall be targeted. In other words, processing should start with the type of use that presents the highest value-added, generates the greatest ecological benefit and enables the maximum number of multiple uses. The objective is to achieve an optimum balance between the specified criteria.

A study commissioned by the FOEN clearly shows that – both in absolute terms and based on one cubic metre of wood – material use generates more employment and value-added during all stages of the value chain than energy use. With respect to the contribution to reducing CO_2 emissions, studies have shown that cascade use yields more positive CO_2 effects than immediate energy use. Results from National Research Programme NRP 66 “Resource Wood” on the best use of wood from an environmental perspective also point in this direction: due to multiple substitution effects, the environmental benefit per volume of wood used can be improved through cascade use. Particular advantages arise for the environment if polluting materials or energy sources are substituted through cascade use. Regarding the differences between deciduous and coniferous tree species, it should be noted that a higher proportion of energy wood arises in the case of hardwood, and cascade use is more difficult to implement here due to the quality of the wood fibres. The creation of competitive products from the entire tree stem is a key precondition for the successful implementation of cascade use

Timber single-family dwelling in Hinwil (Zurich): as a light and strong construction material, wood is ideally suited for settlement densification through the extension and renovation of existing buildings.

5 Objectives

The Wood Resource Policy defines four objectives with target values and indicators. The quantified targets reflect the current status of knowledge, which must be assessed and updated regularly.

Objective 1

The wood harvesting potential of Switzerland's forests shall be exploited sustainably by an efficient Swiss forestry sector.

Indicator	Target value
Volume of wood harvested (Switzerland, calculated with adjustment factors, cf. fig. 3) S: Forest statistics	Exploitation of wood harvesting potential of around 8.2 million m^3 / year

The standing volume in Swiss forests is increasing constantly and it is high compared to other European countries. More wood could be harvested in Switzerland's forests. It could even exceed increment in some regions and for short periods without posing any threat to sustainability. Increased wood harvesting contributes to forest regeneration and a more balanced age-class structure and, hence also, to greater forest stability. This means that forests can provide better protection against natural hazards. In terms of biodiversity, opportunities also arise for photophilous species.

The amount of wood that can be harvested in Swiss forests annually taking various factors into account is referred to as the wood harvesting potential. These factors include, in particular, social requirements and forest services (forest reserves, recreational forests, protective forests) and economic factors (wood prices, harvesting costs). A study commissioned by the FOEN (Hofer P. et al. 2011) shows that between 2016 and 2026, it will be possible to harvest between 7.5 and 9 million cubic metres of wood without posing any threat to sustainability. Based on these calculations, an annual wood harvesting potential of 8.2 million cubic metres was defined in the Forest Policy 2020 and the Wood Resource Policy. Current calculations show that the strength of the Swiss franc has a clear impact on the economically viable wood harvesting potential. Hence the target value is being reassessed in the context of the further development of the Forest Policy 2020.

The wood harvesting potential is not evenly distributed in terms of tree species and regions. Unexploited potential exists above all in the case of deciduous trees and in the Pre-Alps and Alps, where wood harvesting costs are comparatively high. In contrast, the fourth Swiss National Forest Inventory NFI 4 revealed a reduction of around 10 % in the standing volume of the economically popular spruce species in the accessible Central Plateau region between 2006 and 2013.

Whether the potential is used is ultimately the decision of forest owners and managers. A significant number of private forest owners do not supply any wood even when wood prices are rising. An important reason for this is the small-scale nature of these forest plots, which are of minor economic significance for the owners (problem of marginality).

Objective 2

Demand for material wood products in Switzerland shall increase, particularly for those produced using wood from Swiss forests.

Indicator	Target value
Final wood consumption Switzerland, material (excluding paper / paperboard products) S: Final wood consumption	20 % increase in the consumption of material wood products from 3.05 million m^3 (2012) to 3.7 million m^3 (2020)
Proportion of Swiss wood in final wood consumption, material S: Final wood consumption	Increase in proportion of Swiss wood in total final material wood consumption from around 35 % (2012) to 40 % (2020)
Proportion of wood used in multi-family dwellings (MFD) Switzerland, new buildings and extensions / conversions S: Final wood consumption	Increase in wood content of multi-family dwellings (MFD) (new buildings, extensions / conversions, Switzerland) > MFD, new buildings: from 6.5 % (2012) to 8 % (2020) > MFD, ext. / conv.: from 30 % (2012) to 40 % (2020)
Proportion of Swiss wood in Swiss building stock S: Final wood consumption	Increased use of Swiss wood in building sector from around 35 % (2012) to 40 % (2020)

"Material applications" are understood as all non-energy uses of wood. Objective 2 focuses on all building-related uses of wood as this is where the greatest potential by far arises for wood use in terms of volume and where the greatest potential exists in terms of the contribution to climate and energy policy. Approximately 45 % of final energy use in Switzerland is accounted for by the construction of buildings, heating and cooling processes, and hot water production. The buildings sector generates approximately one third of Switzerland's CO_2 emissions. This makes it one of the most resource intensive sectors which emits a considerable volume of environmentally- and climate-harmful gases.

Wood facilitates energy-efficient construction (for example in accordance with Switzerland's new sustainable building standard "Standard Nachhaltiges Bauen Schweiz SNBS") as when it is used as a construction material it can provide better heat-insulating properties than other materials and includes little embodied energy. At the same time, as a renewable and climate neutral raw material, wood can be used as a substitute for energy-intensive materials. The obvious advantages of wood for inward settlement densification, which is targeted by spatial planning policy, include its higher level of prefabrication than other materials and the low net weight of timber building components.

As the data show, the demand for wood in the residential building sector is growing. The challenge now consists in increasing the proportion of this wood that is supplied from Swiss forests. This necessitates an intact, internationally competitive forest and wood value-added chain that can grow beyond the obstacle of the 'strong franc'.

Objective 3
Energy wood shall be sustainably harvested and used in a way that is efficient and environmentally friendly.

Indicator	Target value
Volume of forest energy wood harvested (Switzerland, calculated with adjustment factors, cf. fig. 3) S: Forest statistics	Exploitation of the forest energy wood harvesting potential of around 3.1 million m^3 / year or 8.3 TWh
Energy wood harvested from non-forest sources (woodland fragments, waste wood, wood residuals from sawmills) S: Energy wood statistics	Exploitation of energy wood harvesting potential outside the forest of around 2.9 million m^3 / year or 7.8 TWh of heat and power
Degree of utilisation S: Energy wood statistics	Increase in efficiency

In response to the natural and nuclear disaster in Fukushima, the Federal Council and parliament decided to adopt a new energy policy and carry out a phased withdrawal from nuclear power. The Energy Strategy 2050 aims to achieve greater efficiency and the increased use of renewable energy sources. Through an initial package of measures, the federal authorities aim to reduce the average final energy consumption per capita and year by 16 % by 2020 and by 43 % by 2035, compared with the base year 2000. It is planned to increase the domestic production of renewable electricity to replace the power previously supplied by the nuclear power plants (4.4 TWh by 2020 and 11.5 TWh by 2035). The FOEN believes that 25 TWh of renewable energy can be generated through the expansion of existing capacity and exploitation of potential.

According to different calculations and estimates made by the FOEN, the approximately 4.2 million m^3 of wood used annually for energy purposes today could be increased by 50 % to 6.3 million m^3 per year by 2020. In the case of forest wood, the current volume of energy wood of 2.1 million m^3 per year could be increased by around 1 million m^3 per year without any negative impacts on forests and their functions. The same volume could be obtained from the residuals, waste wood and woodland fragments assortments. Primary energy use can be increased accordingly from around 11 TWh to 16 TWh. The efficiency of energy wood use is measured here on the basis of the ratio of conversion losses to final energy.

Due to the limited availability of the specified wood resources, energy wood must be harvested as efficiently as possible and with a maximum possible substitution effect in relation to fossil raw materials. The Swiss Confederations' energy policy position gives high priority to the efficient and clean production of heat and the production of heat and electricity with a high level of efficiency or annual use efficiency. The overall effect achieved by fuel treatment up to now is lower and it remains irrelevant. The management of the nutrients contained in energy wood needle and branch material during energy wood harvesting is a challenging task.

Objective 4
The innovation capacity of the forest and wood value-added chain shall increase.

Indicator
Applied research and development
Product and process innovations
Patents, awards
Technological development, Industry 4.0

Innovation means permanent development, the ongoing introduction of new processes, products and services, and organisational and management systems, successful marketing, and the accessing of new markets. In the context of globalised markets, it is the most important pillar of sustainable competitiveness. Only very flexible and knowledge-based companies meet this challenge. Technical innovation makes a particularly important contribution to the sparing use of resources and their substitution.

The Swiss forestry and timber sector is often unable to invest in research and development on its own. Hence, the Wood Resource Policy is intended to contribute to establishing favourable preconditions for innovation, for example by supporting applied research and development, knowledge transfer and innovation-friendly operating conditions. The digitisation of industrial and service operations (Industry 4.0) is particularly important in this context.

Façade of Rothenflue Restaurant (Schwyz): the fact that timber structures can be erected in a very short time is a major plus – from a financial point of view too.

6 Wood Action Plan

The Wood Action Plan is the most important instrument for implementing the objectives of the Wood Resource Policy. It has three priority areas and the FOEN can support projects relating to these priority areas.

The implementation of the Wood Action Plan is a joint task to be undertaken by the Confederation and its partners. These partners include representatives of the Swiss forestry and timber sector, in particular. Because the Confederation can mainly act in the framework of its competences by providing stimuli and support, it is the job of the other partners to act on these stimuli and contribute to the successful achievement of the defined objectives.

Principles

All state promotional measures should be based on sound economic principles. In addition to this, national policy concerns (public interest) always constitute an important element of promotion policies. In accordance with the Federal Swiss Constitution (Article 103), state promotional instruments may also be deemed necessary on the basis of a policy assessment if the self-help measures available to the private actors involved can be deemed as insufficient for the management of economic structural change. Thus promotion is situated in a permanent field of tension between economic rationality and the political demands of interest groups. The design of promotional instruments assumes enormous significance against this background: they must give rise to the minimum possible distortion of economic competition.

Overall, the Wood Action Plan focuses on accompanying and supporting instruments. These include, in particular:
> Advice and information
> Communication, knowledge transfer, coordination and consultation
> Applied research and development
> Implementation projects
> Regulatory instruments for increasing the use of wood

The implementation of the Wood Resource Policy involves the following summarised principles:
> *Joint task:* The objectives of the Wood Resource Policy can only be achieved if all of the relevant actors contribute to the process. Hence the implementation of the measures defined in the Wood Action Plan represents, in particular, a joint task to be shared by the Confederation, the Swiss forestry and timber sector and the cantons. Cooperation shall be intensified.
> *Strategic role of the Confederation:* The Confederation coordinates the implementation of the Wood Resource Policy. It highlights the future challenges in relation to the harvesting and use of the resource wood and provides information and the necessary decision bases.
> *Focus on priority areas:* Resources are concentrated on the measures and instruments which, within the framework of the available legal options, can make the maximum possible contribution to the fulfilment of the objectives and are based on marketable solutions (principle of efficiency).
> *Rolling planning:* The Wood Resource Policy is conceived as an open and dynamic policy, which takes changing conditions and new developments into account. Similarly, the Wood Action Plan must be periodically assessed and adapted (rolling planning).
> *Avoidance of competition distortion:* The focus of the measures and instruments lies on the pre-competitive and sector-wide context. To improve the competitiveness of the Swiss forestry and timber sector, market-oriented projects are also needed in this context.

Priority Measures

The 2017–2020 Wood Action Plan is focused on three priority areas. Projects can be submitted on these areas: for example, market-oriented projects, applied research and development projects, and communication projects. If projects contribute to the attainment of the objectives defined in the Wood Resource Policy they basically qualify for financial support. The conditions and all of the necessary documentation for project submissions are explained on the Wood Action Plan web page (available in German, French and Italian). It also contains an overview of previously implemented projects.
www.bafu.admin.ch/aktionsplan-holz

Priority Measure 1
Optimised cascade use

The efficient extraction and use of resources is essential due to increasing environmental problems and the global scarcity of resources. With regard to the raw material wood, questions relating to the optimum use of wood and the advantages and disadvantages of multiple use (cascade use) are dealt with from both an ecological and economic perspective.

Questions to be answered

> What (ecological, economic, social) value-added does the multiple, cascade use of wood create?
> Which resources are suited to multiple cascade and market-oriented uses (tree species, assortments)?
> What incentives are needed for ensuring an optimal resource supply?
> How must wood products, production process and general operating conditions be designed to enable multiple cascade and market-oriented use?
> Which developments are required to establish a closed jointly-acting Swiss forest and wood value-added chain (cooperation, clusters, general conditions)?

Which actors are the results aimed at?

Actors of the Swiss forest and forest and wood value-added chain, the energy sector and public-sector decision-makers.

Priority Measure 2
Climate-appropriate building and refurbishment

Around 45 % of final energy in Switzerland is used for the construction of buildings, for heating and cooling, and for hot water production. This means that the building sector is one of the most resource-intensive and emits a considerable volume of environmentally-harmful and climate-damaging substances. Accordingly, this sector offers considerable potential when it comes to climate and energy policy – not only in relation to the construction of new buildings but also when it comes to the densification of existing urban space.

Questions to be answered

> How can the new timber construction requirements (particularly in relation to noise and fire protection) be implemented on a practical level?
> What information can already be obtained in terms of quality management and durability, and how is it being incorporated at the level of implementation?
> What challenges does the maintenance of large-scale timber (hybrid) structures pose?
> Which system advantages can be obtained in timber construction with the help of digitisation of the industry and how could they be implemented?
> Under which preconditions do different wood-based heating systems provide efficient results with the minimal possible environmental impacts?
> How does the sector need to adapt in relation to large-scale timber construction?

Which actors are the results aimed at?

Swiss timber and energy sector, planners, architects, clients and investors.

Priority Measure 3
Communication, knowledge transfer and cooperation

The demand for wood from Swiss forests among private building clients is very low. Although institutional clients are showing a growing interest in sustainability, they rarely focus on wood as a building material. Architects, planners, engineers, and the property and finance sector require target-group-specific information. Greater cooperation between science, business and the public sector is considered necessary.

Questions to be answered

> What kind of communication is required for the Swiss population to increase its demand for products made of Swiss wood? The “WOODVETIA” campaign will create a level playing field for this from 2017.
> How can knowledge deficits and prejudices in relation to large-scale timber structures be overcome among institutional clients?
> How can knowledge transfer to experts in the forestry, timber and construction sectors be further optimised?
> Where do opportunities arise for public sector actors for coordination with the involvement of the timber sector (in particular, buildings programme, SwissEnergy programme, BBL, ARE)?

Which actors are the results aimed at?

Swiss population, institutional clients, forestry, wood and energy professional groups, architecture and planning.

The priority areas of the Wood Action Plan have the following interfaces with other programmes and projects:
> FOEN: climate policy

> FOEN: waste policy and air pollution control
> SFOE: Energy Strategy 2050, Energy in Buildings research programme; R + D, wood energy sector, biomass, energy-related bases; The Confederation: exemplary in energy
> FOEN, SFOE: Biomass strategy
> SECO: new regional policy
> CTI: European Research Area Network ERA-NET (WoodwisdomNet+, Cofund ForestValue – Innovating the forest-based Bioeconomy)
> Federal Office for Spatial Development ARE: spatial development and planning
> BBL: KBOB
> Parliamentary initiative 12.477: the use of Swiss timber in publicly financed buildings
> Activities of the wood umbrella group Lignum Holzwirtschaft Schweiz
> Other activities of the Swiss forestry and timber sector
> NRP 66, NRP 70 Energy Turnaround, NRP 71 Managing Energy Consumption
> SIA standards

Finance and Organisation

The executive management of the FOEN decided that the Wood Action Plan will be extended until 2020. CHF 4 million shall continue to be made available annually for its implementation, subject to budget adjustments by the Federal Council and the parliament.

The financial contributions of the partners are taken into account in the definition of the projects. Depending on the process, these shall account for at least 50 % of the costs (cf. *www.bafu.admin.ch/aktionsplan-holz*).

The FOEN is the lead agency for the Wood Resource Policy. In particular it has a strategic and coordinating function, in which special emphasis is given to the long-term perspective and the consideration of the various societal interests relating to forests and the raw material wood. Programme control and management are undertaken by the FOEN. The programme management is responsible for the orderly implementation of the Wood Action Plan. An advisory committee comprising representatives of the Swiss forestry and timber sector, the cantons, other federal authorities, nature conservation organisations and the property sector shall collaborate on strategic issues in relation to programme control.

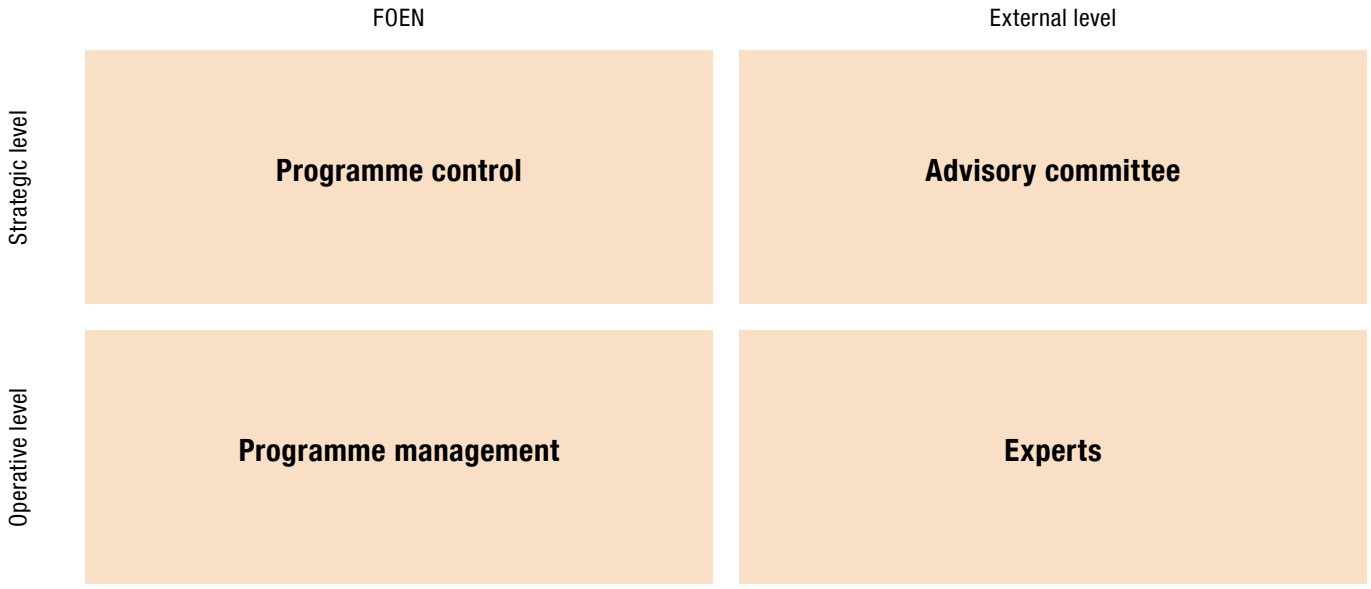

Fig. 2 *Wood Action Plan 2017–2020: Organisation. Advisory committee, permanent representatives: WaldSchweiz; Konferenz der Kantonsförster; Holzindustrie Schweiz; Holzbau Schweiz; Verband Schweizerischer Schreinermeister- und Möbelfabrikanten; Holzenergie Schweiz; Lignum Holzwirtschaft Schweiz; Cedotec, Lignum Office romand.*

Measuring moisture in a beech log: the efficient and environmentally friendly use of energy wood contributes to fulfilling the Confederation's energy targets.

> Annex

Adjustments to the Wood Resource Policy and Wood Action Plan

Table 1: *Overview of adjustments. The following adjustments have been made compared to the versions of February 2014 (wood action plan 2013–2016).*

Vision			
2013–2016	Wood is a formative element of Swiss architectural and living culture and of the country's quality of life. The forestry and timber sector makes an important contribution to the Swiss Confederation's energy, climate and resource policy objectives. From the tree to the end product, the forest and wood value-added chain is internationally competitive and environmentally friendly.		
2017–2020	Wood is a formative element of Swiss architectural and living culture and of the country's quality of life. The forestry and timber sector makes an important contribution to the Swiss Confederation's forest, energy, climate and resource policy objectives. Thanks to high innovation capacity, from the tree to the end product, the wood value-added chain is internationally competitive, socially viable and environmentally friendly. The resource wood is used on a cascade and multiple basis.		
Main objective			
2013–2016	The supply of wood from Swiss forests shall be sustainable and its use shall be resource-efficient in accordance with optimised cascade use.		
2017–2020	The aim of the Wood Resource Policy is to ensure that wood from Swiss forests is supplied, processed and used in a way that is sustainable and resource-efficient. In this way it makes the maximum possible contribution to forest, climate and energy policy.		
Objective 1			
Version	**Objective**	**Indicator**	**Target value**
2013–2016	The sustainably harvestable wood production potential of the Swiss forest shall be exploited to the full by an efficient Swiss forestry sector.	> Volume of wood harvested (national level)	> Exploitation of the wood harvesting potential of around 8.2 million m^3 / year (compact wood, including bark and branch brushwood, derived from annual increment)
2017–2020	The wood harvesting potential of Switzerland's forests shall be exploited sustainably by an efficient Swiss forestry sector.	> Volume of wood harvested (Switzerland, calculated with adjustment factors, cf. fig. 3) S: Forest statistics	> Exploitation of the wood harvesting potential of around 8.2 million m^3 / year[1]
	Reason for adjustment in 2017 version > Slight linguistic revision of objective > Minor adjustments to the definitions of the indicator and target value		
Objective 2			
Version	**Objective**	**Indicator**	**Target value**
2013–2016	Demand for material wood products in Switzerland shall increase, with particular emphasis on wood from Swiss forests.	> Per capita consumption of sawnwood and derived timber products[2]	> 20 % increase in the per-capita consumption of both sawnwood and derived timber products – Sawnwood: from 0.24 m^3 per capita (2006) to 0.29 m^3 per capita (2020) – Wood derivatives: from 0.09 m^3 / per capita (2006) to 0.10 m^3 per capita (2020)
		> Proportion of wood in the entire Swiss building stock (new buildings and "Bauen im Bestand")[3]	> At least 50 % increase in the wood content of the entire Swiss building stock (new buildings)[4] – SFD: from 11.4 % (2005) to 17 % (2020) – MFD: from 3.6 % (2005) to 8 % (2020)

Version	Objective	Indicator	Target value
2017–2020	Demand for material wood products in Switzerland shall increase, particularly for those produced using wood from Swiss forests.	> Final wood consumption Switzerland, material (excluding paper / paperboard products); > Proportion of Swiss wood in final wood consumption, material S: Final wood consumption	> 20 % increase in the consumption of material wood products from 3.05 million m^3 (2012) to 3.7 million m^3 (2020) > Increase in proportion of Swiss wood in total final material wood consumption from around 35 % (2012) to 40 % (2020)[5]
		> Proportion of wood used in multi-family dwellings (MFD) Switzerland, new buildings and extensions / conversions > Proportion of Swiss wood in Swiss building stock S: Final wood consumption	> Increase in wood content of multi-family dwellings (MFD) (new buildings, extensions / conversions, Switzerland)[6] – MFD, new buildings: from 6.5 % (2012) to 8 % (2020) – MFD, extension / conversion: from 30 % (2012) to 40 % (2020) > Increased use of Swiss wood in building sector from around 35 % (2012) to 40 % (2020)[7]
	Reason for adjustment in 2017 version > Slight linguistic revision of objective > Adjustment of indicators due to better picture of the objective and good base data > Target values were formulated for the new indicators		
Objective 3			
Version	**Objective**	**Indicator**	**Target value**
2013–2016	The use of fuelwood shall increase while taking the principles of sustainable use and efficient and clean exploitation into account.	> Volume of forest energy wood harvested (national level)	> Exploitation of the harvesting potential of around 3.1 million m^3 / year (compact wood, including bark and branch brushwood; derived from annual increment) or 8.3 TWh
		> Energy wood harvested from non-forest sources (woodland fragments, waste wood, residuals from sawmills)	> Exploitation of energy wood harvesting potential outside the forest of around 2.9 million m^3 / year or 7.8 TWh of heat and power
2017–2020	Energy wood shall be sustainably harvested and used in a way that is efficient and environmentally friendly.	> Volume of forest energy wood harvested (Switzerland, calculated with adjustment factors, cf. fig. 3) S: Forest statistics	> Exploitation of the forest energy wood harvesting potential of around 3.1 million m^3 / year or 8.3 TWh[8]
		> Energy wood harvested from non-forest sources (woodland fragments, waste wood, residuals from sawmills) S: Energy wood statistics	> Exploitation of energy wood harvesting potential outside the forest of around 2.9 million m^3 / year or 7.8 TWh of heat and power
		> Degree of utilisation[9] S: Energy wood statistics	> Increase in efficiency
	Reason for adjustment in 2017 version > Formulation of objective adjusted substantively: adapted due to positive development in the energy use of wood > Minor adjustments to the definitions of indicator and target value > An indicator was added to illustrate efficient and environmentally-friendly use with target value		
Objective 4			
Version	**Objective**	**Indicator**	**Target value**
2013–2016	The innovation capacity of the wood value-added chain shall increase.	> Research capacity (human resources, finance), number of innovative projects, patents, awards	–
2017–2020	The innovation capacity of the forest and wood value-added chain shall increase.	> Research and development > Product and process innovations > Patents, awards > Technological development, Industry 4.0	–
	Reason for adjustment in 2017 version > Slight change to formulation of objective. > Adjustments to the indicators		

Objective 5			
Version	**Objective**	**Indicator**	**Target value**
2013–2016	The Wood Resource Policy shall make an important contribution to the fulfilment of the objectives of other sectoral policies through optimum coordination.	–	–
2017–2020	Cancelled	–	–
	Reason for adjustment in 2017 version > Objective 5 was cancelled as an individual objective. Due to its importance, its content was integrated into the main objective		

Wood Action Plan	
Version	**Priority Measures**
2013–2016	1. Base data 2. Mobilisation of Swiss wood 3. Raising awareness among the population and institutional building clients 4. Hardwood use 5. High-volume timber construction systems 6. Framework conditions
2017–2020	1. Optimised cascade use 2. Climate-appropriate building and refurbishment 3. Communication, knowledge transfer and cooperation
	Reason for adjustment in 2017 version > The priority areas were focused on the topics in which a considerable action requirement was identified based on the recommendations of the evaluation of the Wood Action Plan 2013–2016

1 Cf. Bundesamt für Umwelt BAFU 2013 (b); target value 8.2 million m^3/year: harvested wood volumes, i.e. sales volume according to the forestry statistics plus volumes that are not recorded in the statistics, e.g. extra allowance, bark, small volumes produced in private forests (adjustment factors). Hofer P. et al. 2011.

2 Cf. Bundesamt für Umwelt BAFU 2008 (a).

3 Cf. KMU Zentrum Holz 2006. The proportion of wood is the proportion of the total volume of new buildings in Switzerland accounted for by timber SFDs and MFDs.

4 This refers to residential, commercial and public sector buildings, both newly constructed and refurbished.

5 Cf. Neubauer-Letsch B. et al. 2015. Material final wood consumption in Switzerland in 2012 in m^3: 3,047,700; of which use of wood of Swiss origin in m^3: 1,143,800

6 Development of proportion of materials accounted for by wood in the structure of multi-storey housing quantified on the basis of planning permissions granted.

7 Use of wood in building sector in Switzerland in 2012 in m^3: 985,700; of which use of wood of Swiss origin in m^3: 374,600.

8 Cf. Hofer P. et al. 2011.

9 Degree of utilisation = Net energy / raw material input; weather-adjusted;

Development of the indicators

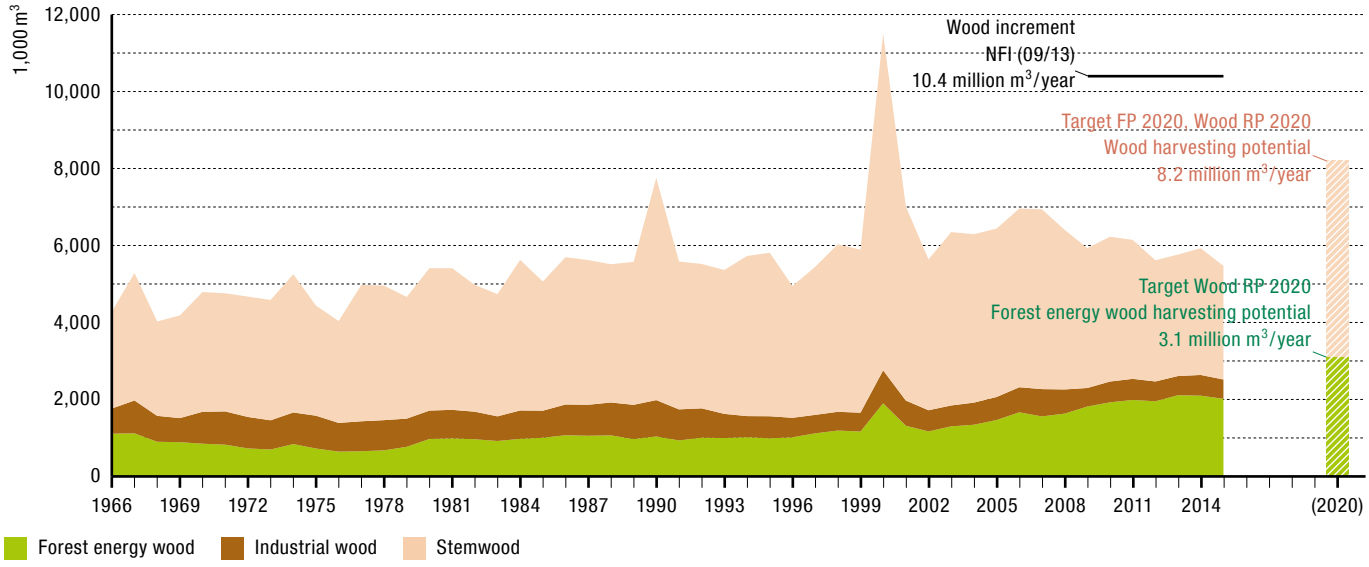

Fig. 3, Objectives 1 and 3 *Exploitation of wood harvesting potential (total) and forest energy wood potential. Wood harvest 1966–2015 by assortment in 1000 m³. Source: Forest statistics FSO. The data on the wood harvest were corrected using adjustment factors (Hofer P. et al. 2011), as certain wood harvesting volumes are not recorded in the forestry statistics (FSO). The wood harvesting potential corresponds to the volume of wood theoretically available for harvesting in Swiss forests annually, based on different forest management scenarios. Various factors like societal requirements and forest services (e.g. reserves, recreation, protective forest) and economic factors (wood prices, harvesting costs) are taken into account in the calculations. Increment can act as a benchmark, however it is not used as the basis for the determination of the wood harvesting potential.*

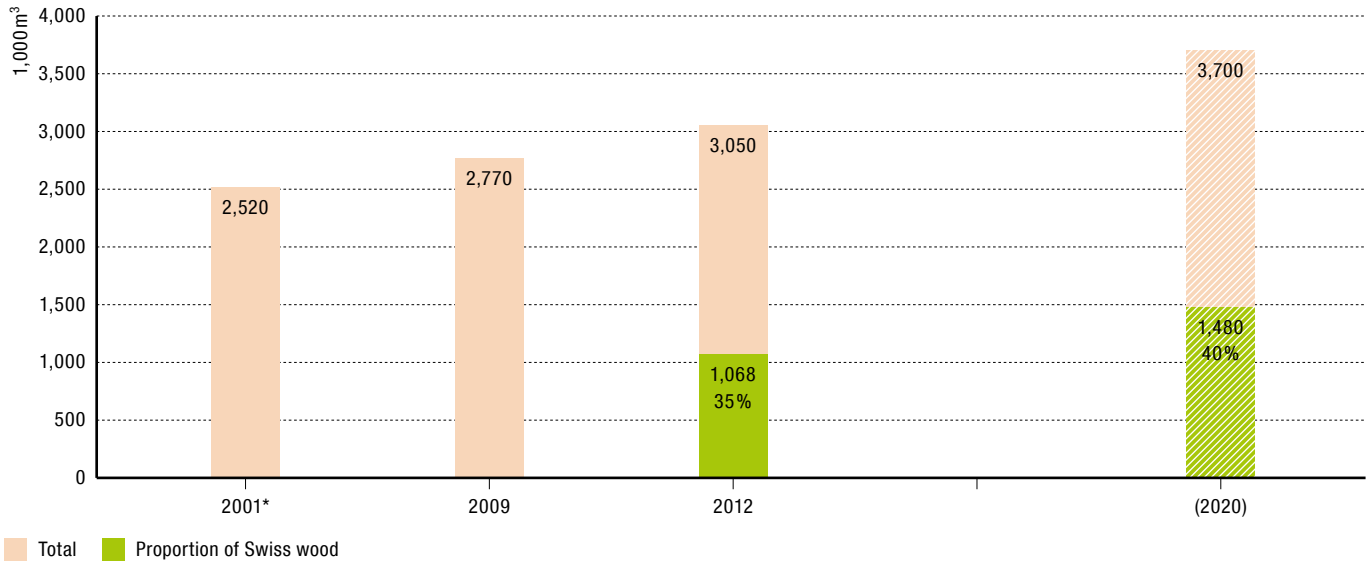

Fig. 4, Objective 2 *Increase in the consumption of material wood products. Final wood consumption in 1000 m³. Material use, excluding paper and paperboard. Source: Neubauer-Letsch B. et al. 2015. 2001*: Study not comparable in the building sector.*

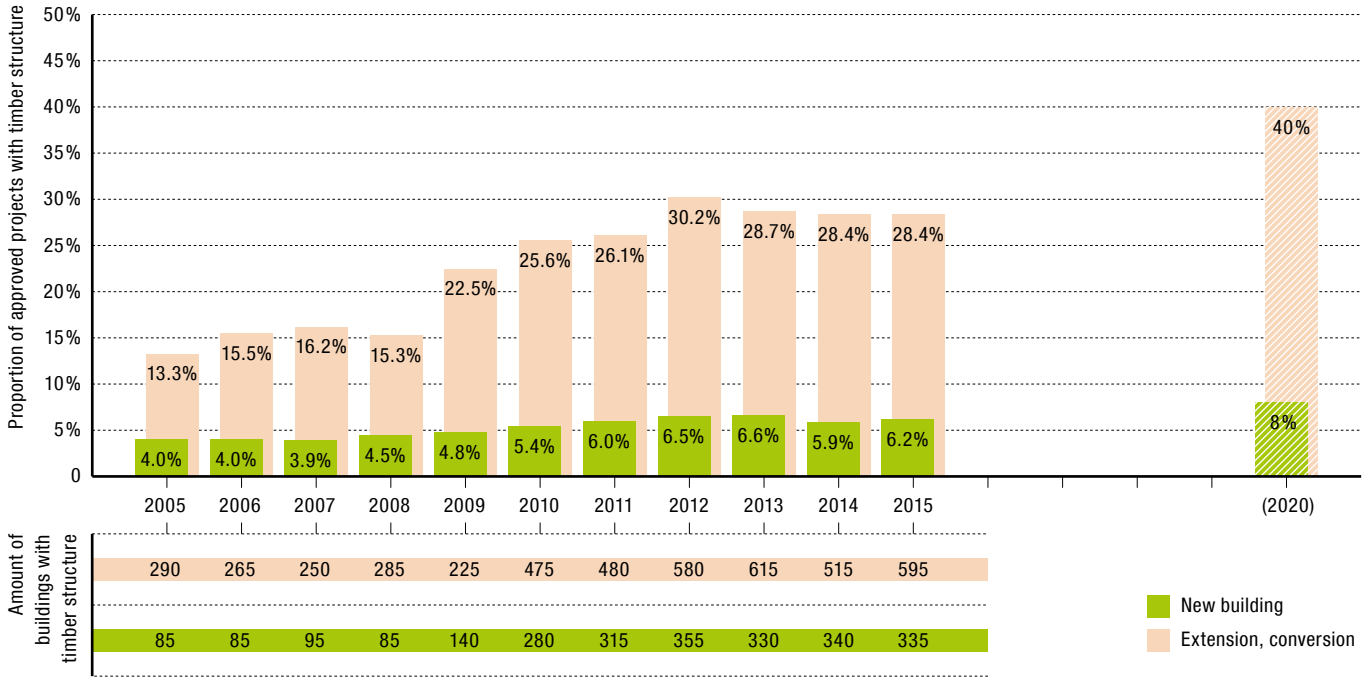

Fig. 5, Objective 2 *Increase in proportion of wood used in multi-family dwellings in Switzerland. Projects for multi-family dwellings for which planning permission was granted, 2005–2015. Source: Neubauer-Letsch et al. 2015.*

Fig. 6, Objective 3 *Sustainable energy wood harvest and efficient, environmentally-friendly wood use. Energy wood consumption, breakdown based on electricity and heat production and absolute and relative conversion losses, 1995–2015, weather-adjusted. Source: Energy wood statistics, SFOE.*

The forestry and timber sector uses its collective force to raise the public's awareness of the advantages of Swiss wood. #Woodvetia

> Reference Material

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 catagories are: > stemwood, > 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.

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.

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

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 or – in the case of biologically degradable products – possible composting.

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 into another.

Cubic metres
The cubic metre is the unit of measure for volume in the International System of Units (SI) and usually designated using the unit symbol m^3. A cubic metre corresponds to the volume of a cube with an edge length of 1 metre. Cf. solid cubic metre.

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.

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

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.

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

Forest enterprise
Organisational unit which manages forests strategically and operatively as a public or private legal entity or natural person. It can involve one or more forest owners. Forest enterprises in Switzerland are usually supported by a public authority, for example a political commune, citizens' commune or corporation.

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.

Greenhouse gas
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 > stemwood 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 stemwood volume (> stemwood) of trees. In the > NFI, increment refers to the increase in the stemwood volume of all living trees, the stemwood volume of all newly recorded (ingrowth) trees, and the modelled increase in the stemwood 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.

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.

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).

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

Resource efficiency
The ratio of a specific benefit to the natural resources required to produce it. The benefit can be provided in the form of a product or service. The lower the input of natural resources required 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 use.

Resource productivity
Resource productivity expresses the (volume) ratio of products (out-put) to the resources used (input) in the production process.

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

Sawn timber
Products produced in saw-mills by cutting > stemwood and logs to produce, for example, boards for use in building, packaging and furniture production.

Solid cubic metre
Unit of measure for > roundwood. 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 roundwood.

Stemwood
Aboveground wood of the tree stem (without branches but with bark).

Stemwood logs
The more valuable > roundwood that can be used as sawnwood or veneers. Normally in the form of > stemwood.

Substitution
Replacement of a material with another.

Sustainability (Schweizer Bundesrat 2012 und 2016)
"Responsibility for the future means that the principles of precaution, costs-by-cause and liability must be promoted as fundamental conditions for economic, ecological and societal action at all levels that is viable in the long term. A precautionary approach is necessary to prevent any possible damage to human health or the environment and preventive measures should be taken, even if complete clarity in relation to the relevant scientific connections is not yet available. It should be ensured that prices reflect the true costs, that anyone who causes harm to human health or the environment shall bear the costs. […] It should be ensured that all three target dimensions and all criteria of sustainability are taken into account in policy design and organisation (comprehensive consideration of the three dimensions of sustainability)."

Value-added
Gross value-added
Gross value-added is calculated by subtracting preliminary outlay, that is goods and services consumed, processed or converted 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
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
Roundwood from forests or outside forests that is made available for processing, for example cut to produce sawnwood in sawmills or processed for the production of paper.

Wood supply
Includes timber harvesting and supply up to the purchaser.

Wood use
Roundwood from forests or outside forests which is used for material or energy purposes.
Material use
wood 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 that grows outside the forest in open country, for example, in patches of woodland, as shrubs or as hedges. Wood growing on the edges of transport infrastructure, for example, motorways, is often considered as woodland fragment.

List of acronyms

BKB
Beschaffungskonferenz des Bundes (Federal Procurement Conference FPC)

CTI
Commission for Technology and Innovation

ERA-NET
European Research Area Network

EUTR
European Union Timber Regulation

FBL
Federal Office for Buildings and Logistics

FOEN
Federal Office for the Environment

FP
Forest Policy

FSO
Federal Statistical Office

KBOB
Koordinationskonferenz der Bau- und Liegenschaftsorgane der öffentlichen Bauherren (Group for the Coordination of Federal Construction Projects and Properties)

NFI
Swiss National Forest Inventory

MFD
Multi-family dwelling

NRP
National Research Programme

R + D
Research and development

SECO
State Secretariat for Economic Affairs

SFD
Single-family dwelling

SFOE
Swiss Federal Office of Energy

SIA
Swiss Society of Engineers and Architects

TWh
Terrawatt hours

VVEA
Verordnung über den Verkehr mit Abfällen (Ordinance on Movements of Waste)

WOOD RP
Wood Resource Policy

WSL
Swiss Federal Institute for Forest, Snow and Landscape Research WSL

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> Up-to-date information on the Wood Resource Policy is available on the FOEN website www.bafu.admin.ch/aktionsplan-holz