Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of the Environment,
Transport, Energy and Communications DETEC

Federal Office for the Environment FOEN

Version of 30 October 2008

Wood Resource Policy

Strategy, Objectives and Action Plan for the Resource Wood

Published by the Federal Office for the Environment (FOEN)

in Cooperation with the Swiss Federal Office of Energy (SFOE), the State Secretariat for Economic Affairs (SECO) and relevant partners

Acknowledgements

Published by
Federal Office for the Environment (FOEN)
FOEN is an agency of the Department of the Environment, Transport, Energy and Communications (DETEC).

Author
Ulrike Krafft, Project Management, Wood Resource Policy, Forest Division, FOEN

Advisory Group FOEN, SFOE, SECO
Andreas Götz, Vice Director FOEN
Rolf Manser, Head of Forest Division, FOEN
Thomas Stadler, Head of Climate, Economics, Environmental Observation Division , FOEN
Marco Zanetti, Forest and Timber Industry Section, FOEN
Michael Kaufmann, Deputy Director SFOE
Rudolf Schiess, Directorate for Promotion Activities and Regional Policy, SECO

Contacts FOEN
Rolf Manser, Tel. + 41 (0) 31 32 478 39, *rolf.manser@bafu.admin.ch*
Ulrike Krafft, Tel. + 41 (0) 31 32 440 45,
ulrike.krafft@bafu.admin.ch

Suggested citation
Federal Office for the Environment (FOEN) 2008: Wood Resource Policy: Strategy, Objectives and Action Plan for the Resource Wood. Bern. 31 p.

Downloadable PDF file
www.environment-switzerland.ch/ud-1001-e

Contents

Abstracts **4**

Foreword **5**

Introduction **6**

1 Significance and Context **7**

Significance 7

System boundaries and interfaces 7

Potential areas of conflict 8

The Swiss forestry and timber sectors 9

2 Vision **9**

3 Main Objective **10**

4 Objectives **10**

Explanation of the objectives 12

5 Wood Action Plan **16**

6 Priority Measures **18**

7 Finance and Organisation **23**

Annex **24**

Interfaces: potential synergies and tensions 24

Reference Material **26**

Glossary 26

List of Acronyms 29

Bibliography 30

Abstracts

The purpose of the wood resource policy is to support the consistent but sustainable utilisation of wood from domestic forests and the resource-efficient use of the raw material wood. A wood action plan has been established to facilitate the target-oriented implementation of the wood resource policy. The priority in the implementation of the policy is the ecologically and economically sound use of wood. The Federal Office for the Environment (FOEN) is acting as the lead agency for this policy in coordination with the relevant partners. FOEN is committed to a long-term perspective and has the task of taking the different societal interests in the forest and the raw material wood into account.

Keywords:
Wood resource policy, Wood action plan, Efficient and sustainable wood supply, Resource-efficient wood use, Cascade use

Mit der Ressourcenpolitik Holz soll eine konsequente, aber nachhaltige Holznutzung aus einheimischen Wäldern und eine ressourceneffiziente Verwertung des Rohstoffs unterstützt werden. Zur zielgerichteten Umsetzung der Ressourcenpolitik Holz dient ein Aktionsplan Holz. Bei der Umsetzung steht der ökologisch und ökonomisch sinnvolle Einsatz des Holzes im Vordergrund. Das Bundesamt für Umwelt (BAFU) übernimmt die Federführung für diese Politik in Abstimmung mit den relevanten Partnern. Das BAFU ist einer langfristigen Perspektive verpflichtet und hat die Aufgabe, die verschiedenen gesellschaftlichen Interessen am Wald und am Rohstoff Holz zu berücksichtigen.

Stichwörter:
Ressourcenpolitik Holz, Aktionsplan Holz, effiziente und nachhaltige Holzbereitstellung, ressourceneffiziente Holzverwertung, Kaskadennutzung

La politique de la ressource bois doit soutenir une exploitation rigoureuse et durable du bois issu de forêts domestiques ainsi qu'une valorisation efficiente de la matière première. Pour être concrétisée de manière cohérente, la politique de la ressource bois se double d'un plan d'action mettant l'accent sur une utilisation écologique et économique du bois. Cette politique est placée sous l'égide de l'OFEV, en accord avec les partenaires concernés. L'OFEV est tenu d'adopter une perspective à long terme et se doit de prendre en compte les divers intérêts de la société liés à la forêt et à la matière première bois.

Mots-clés:
politique de la ressource bois, plan d'action bois, récolte de bois efficiente et durable, valorisation efficiente de la ressource bois, utilisation en cascade

Con la politica della risorsa legno si intende promuovere l'utilizzazione coerente e sostenibile del legno dei boschi svizzeri e la valorizzazione efficiente della materia prima legno. Un piano d'azione Legno è stato elaborato per assicurare l'attuazione mirata della politica della risorsa legno improntata all'impiego razionale, dal punto di vista ecologico ed economico, del legno. L'Ufficio federale dell'ambiente (UFAM), che guida questa politica d'intesa con i partner rilevanti, opera secondo una prospettiva a lungo termine e tenendo conto dei vari interessi che la società ha nei confronti del bosco e della materia prima legno.

Parole chiave:
politica della risorsa legno, piano d'azione Legno, garantire in modo sostenibile ed efficiente la disponibilità del legno, valorizzazione efficiente del legno, utilizzazione a cascata

Foreword

Due to its wide variety of applications in terms of both material uses (building material, compound material, paper/pulp, chemical industry) and energy uses (electricity, heat, BTL fuel), as a renewable resource, wood is in a very strong position to assume a key position in the future raw supply. At the same time, however, such developments prompt greater rivalry between the different forms of use of the resource (i.e. material, energetic, chemical). Increasing wood utilisation in forests also gives rise to increased conflicts of interest with other societal demands on the effects of the forest and the services provided by the forestry sector (e.g. health and well-being, nature conservation).

These demands and requirements must be coordinated. A wood resource policy represents a potential coordination instrument that would be used to control the access to natural resources and, hence also, their consumption. Thus, the wood resource policy, defines guard-rails for the resource wood while taking the different interests in the forest and the raw material wood into account.

In view of the wide-ranging interfaces between wood utilisation and use with other sectoral policies, the Federal Office for the Environment (FOEN) involved various partners in the participative process for the development of the wood resource policy. These partners included, in particular, the Swiss Federal Office of Energy (SFOE) and the State Secretariat for Economic Affairs (SECO). These two authorities participated closely in the development of the wood resource policy and the associated wood action plan. It is also intended to extend this successful cooperation in the context of the implementation of the wood resource policy. Various sectoral associations and organisations were also consulted as part of the policy development process.

This publication reflects the current status of the wood resource policy and wood action plan. The field involved is highly dynamic and various questions remain open in relation to the sustainable use of renewable resources. Changing framework conditions and new information and insights may render the adaptation of the policy necessary. Reliable and stable objectives are, however, an important prerequisite for successful implementation of the policy. Thus, the wood resource policy is based on an open dynamic policy approach which takes changes in the context of the defined guard-rails into account in a measured and balanced way.

We firmly believe that, if it is understood as a shared partnership-based task between the relevant federal authorities, the cantons and the forestry and timber sectors, in particular, the implementation of the wood resource policy will enable us to make a significant contribution to the sustainable utilisation and use of our raw material wood .

Andreas Götz
Vice Director
Federal Office for the Environment (FOEN)

Michael Kaufmann
Vice Director
Swiss Federal Office for Energy (SFOE)

Rudolf Schiess
Directorate for Promotion Activities and Regional Policy (SECO)

Introduction

With the rise in affluence and prosperity, the pressure on the use of natural resources is growing at both national and international level, as is the population's need for intact natural life bases, security and good health. The purpose of a resource policy is to control the access to natural resources and, hence also, their consumption. The wood resource policy defines guard-rails which support the sustainable and efficient utilisation and use of the raw material wood in Switzerland while taking different interests in the forest and the raw material wood into account. FOEN uses the term resource policy synonymously with the term environmental policy.[1]

Wood is an important natural resource for Switzerland: it is a renewable climate-neutral raw material which can be used in both material applications and as an energy source. Wood could also assume greater importance in the future as a source of carbon for the chemical and pharmaceutical industry.

The wood utilisation potential of the forest is not being fully exploited throughout Switzerland. Important reasons for this include the weak demand for wood in the past, the supply behaviour of forest owners, the small-scale ownership structure of the forests and the high utilisation costs in various regions resulting from the nature of the forest terrain.

Population development and economic growth, in particular in Asia, have prompted a strong increase in the demand for energy and resources, a trend which has also contributed to a global scarcity of oil. The effects of these developments can also be felt on the timber markets. The demand for the raw material wood has increased significantly since 2006. Moreover, due to the increasing scarcity of energy resources (security of supply) and climate warming, the focus in energy and climate policy has shifted to renewable resources. This has led to greater rivalry between the different forms of use of the raw material wood (i.e. material vs. energetic use), the availability of which is limited. Conflicts of interest also exist between the demands on the forest and wood utilisation (e.g. recreational use vs. wood utilisation).

Thus, the Swiss Confederation's commitment to the support of the consistent but sustainable[2] utilisation of wood from domestic forests and the resource-efficient use of wood is viewed as essential. In order to be able to translate this support into targeted action, the Confederation has formulated a wood resource policy with FOEN acting as the lead agency in coordination with the relevant sectoral policies, the cantons, the forestry and timber sectors and other relevant partners. This policy defines, *inter alia*, the direction to be taken by the Swiss Confederation in the area of wood promotion on completion of the *holz 21* wood promotion programme (valid until the end of 2008).

A wood action plan has been established to facilitate the target-oriented implementation of the wood resource policy. The priority in the implementation of the policy is on the ecologically and economically expedient use of wood. In terms of the efficient use of wood, cascade uses, which prioritise material use before energetic use, are particularly advantageous while greater overall efficiency in conversion technology should be targeted in relation to the energetic use of wood.

[1] Cf. Bundesamt für Umwelt (BAFU) 2008 (b).

[2] In this publication, the term "sustainable" always refers to the three dimensions of sustainability and signifies the economically viable and socially acceptable and ecologically sound utilisation and use of wood (cf. glossary). It also incorporates the legally defined functions of the forest.

1 Significance and Context

Significance

The wood resource policy is an action programme of the Federal Office for the Environment (FOEN) and is programmatic in nature. FOEN has assumed the role of lead agency for this policy in coordination with the relevant actors as well as the responsibility for the target-oriented implementation of the wood action plan in the framework of its capacities. The relevant actors include, in particular, the Swiss Federal Office of Energy (SFOE), the State Secretariat of Economic Affairs (SECO), the cantons, the forestry and timber sectors, the wood energy sector, the relevant universities and institutes of technology and the environmental organisations. FOEN is committed to a long-term perspective and has the task of taking the different societal interests in the forest and the raw material wood into account in the development and implementation of this policy.

The contents of the wood resource policy are not set in stone. Changing framework conditions and new developments may necessitate the adaptation of the wood resource policy and its objectives. At present the focus of attention is currently on the material and energetic use of wood with a view to maximising the contribution to the Confederation's energy and climate policy objectives. However, if the chemical use of wood were to assume a more prominent role in this context in the future, this development will be reflected correspondingly in the wood resource policy. Thus the wood resource policy aims to be open and dynamic.

System boundaries and interfaces

Together with forest policy, the wood resource policy represents a self-contained utilisation-oriented policy. Its system boundaries extend from the forest as the supplier of the resource wood, along the entire wood value-added chain, through the various processing phases to the recycling or disposal of wood products (cf. Figure 1).

The topic of wood utilisation is the object of both forest policy and the wood resource policy. The Federal Act on Forests (ForA) constitutes the legal framework (cf. in particular Articles 1 and 20 ForA), within which the wood resource policy moves. In other words, the utilisation-oriented approach of the wood resource policy must not put the guarantee of the other legally defined functions of the forest at risk; it must pursue a consistent approach based on the sustainable exploitation of the wood utilisation potential. The objectives defined in the Swiss National Forest Programme (2004) also provide a framework for the wood resource policy.[3] Outside the forest, the wood resource policy defines the main ideas for a resource-efficient use of wood.

The wood resource policy has another important interface with the Swiss Confederation's strategy "*Nachhaltige Entwicklung der Schweiz*" ("Sustainable Development of Switzerland").[4] Switzerland has defined important priority tasks in this strategy, the implementation of which is binding on all authorities. In the area of wood utilisation and use, the strategy is implemented through the wood resource policy. The wood resource policy makes an important contribution to the following key challenges defined in the strategy, i.e. "climate change", "renewable energies", "the use of natural resources" and "economy, production and consumption", and particularly to the action area of "sustainable building".

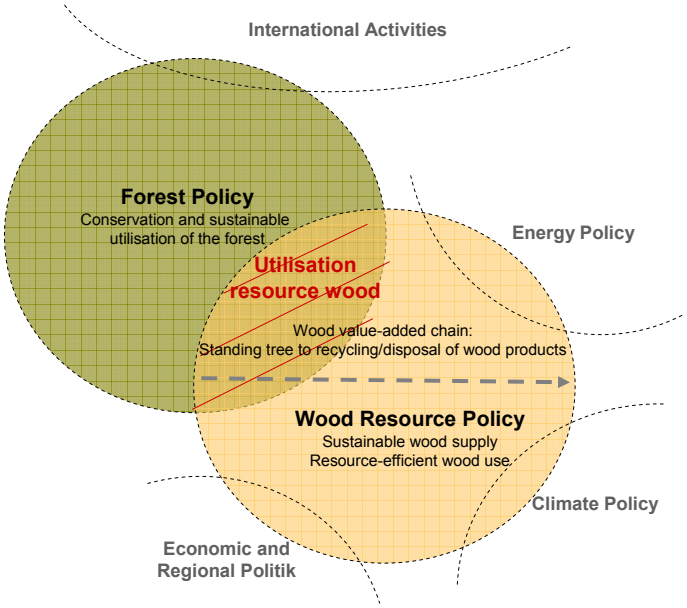
The interfaces to energy and climate policy are closely related to the interface to the sustainable development strategy. Both policies aim to increase the proportion of renewable climate-neutral energy sources used. An equally important interface arises with the Swiss Confederation's new

[3] Cf. Bundesamt für Umwelt, Wald und Landschaft (BUWAL) 2004 (b).
[4] Cf. Schweizer Bundesrat 2008.

regional policy, which contributes *inter alia* to improved production and service structures in rural areas and in the mountain regions, also constitutes an equally important interface to the wood resource policy.[5]

The following activities should be taken into account at international level in particular: the EU presented a Biomass Action Plan for the accelerated development of the use of bioenergy at the end of 2005 and its renewed European Sustainable Development Strategy in mid-2006. The increasing importance of the raw material wood was also addressed through the establishment of the "Forest-based Sector Technology Platform" (FTP, 2004) with its "Strategic Research Agenda" (SRA, 2006).[6] The adaptation of the SRA to the Swiss situation was developed with the "Innovations-Roadmap 2020" and is currently being further developed in the national research project "Wood Fibre 2020".[7]

Figure 1 Positioning and demarcation of the wood resource policy[8]



Potential areas of conflict

Wood utilisation is an important topic for both forest policy and the wood resource policy. The exploitation of the wood production potential of the Swiss forest offers positive effects for both policies (for example, a contribution to creating more structurally rich stable forests, efficient utilisation of the raw material wood). At the same time, as a result of the increased utilisation of wood in Swiss forests results, traditional sources of tension are reinforced and new conflicts also arise (cf. Table 4, Annex). Thus, for example, the population values well maintained, varied, well-lit and "tidy" forest images while fears about the destruction of the forest are prompting opposition to the increased utilisation of the Swiss forest. The aim is to balance the different demands on the forest through the close coordination of both policies.

The interfaces with the individual sectoral policies also offer synergies for the wood resource policy but, depending on how they are organised, these could also become fields of conflict (cf. Table 5, Annex). In particular at the interface with energy policy, conflicts could arise between the principle of cascade use supported by the wood resource policy and that of the energetic use of wood (feed-in tariff) promoted by energy policy. In the case of the interface with climate policy, for example, the

[5] Cf. Schweizer Bundesrat 2007.
[6] Cf. Europäische Kommission 2005, 2006. Rat Europäische Union 2006.
[7] Cf. Berner Fachhochschule Architektur, Holz und Bau 2007.
[8] The diagram only shows some of the important interfaces between the wood resource policy and other sectoral policies. The various interfaces that exist between the other sectoral policy are not examined here.

forest as a CO_2 sink resource can conflict with the forest as a wood resource. The wood resource policy is intended to make a contribution to the optimum use of wood, the balancing of the fields of tension and, where possible, the promotion of synergies between the different demands on the forest and the resource wood.

The Swiss forestry and timber sectors[9]

Due to wide-ranging structural problems in particular, the Swiss forestry sector and a majority of the wood processing operations are not entirely competitive. The characteristic small-scale structure of the sector gives rise to high fixed costs and an inefficient wood supply among the forestry operations. Even against a background of rising wood prices, a significant proportion of private forest owners do not harvest wood due to the very small areas involved and the associated minimal economic relevance of forest ownership in this context (problem of marginality).

Efficient management basically represents a challenge for the forestry operations against the background of the different forest functions (utilisation, protective and health/well-being functions). In the predominantly public forests, political influences contribute to the lack of optimal management: in many cases, the workforce and structures of municipal forestry operations do not reflect the predominance of business considerations. The state incentive systems, which were based hitherto on the subvention of costs, have also contributed to the problems in the forestry sector. These inefficiencies are being eliminated through the New System of Fiscal Equalisation and Division of Tasks (NFA) process.

The efficient processing and use of the wood also requires a competitive Swiss timber sector. The prevailing (small) business structure of the wood processing sector in Switzerland is often unable to keep up with the international cycle of innovation and rationalisation pressures. This is particularly problematic in areas, in which development from commercial to industrial processing is necessary due to competitive pressure from abroad. Thanks to the expansion of sawmill capacities, structural change has however gained momentum, in particular in the first phase of processing, with the result that a greater volume of raw wood was processed domestically in 2007 as compared with previous years.

2 Vision

The vision formulated for the wood value-added chain[10] in the Swiss National Forest Programme in 2004 constitutes one of the cornerstones of the vision of the wood resource policy. It also incorporates the vision of the “2000-Watt Society”, which is gaining in significance due to the societal challenges posed by a sustainable energy future, the conservation of natural resources and improvement of the CO2 balance. The resource wood can make considerable contributions to this energy policy vision, for example through the reduction of energy consumption based on the substitution of energy-intensive materials with the construction material wood.

[9] Cf. Bundesamt für Umwelt, Wald und Landschaft (BUWAL) 2003. (a), (b); 2004 (b). Jaako Pöyry Consulting 2002, 2003, 2004. Waldwirtschaft Schweiz (WVS) 2003. UBS 2005.
[10] Cf. Glossary

Vision

Wood is a formative element of Swiss architectural and living culture and of the country's quality of life. The forestry and timber sectors make an important contribution to the Swiss Confederation's energy, climate and resource policy objectives. From the tree to the end product, the wood value-added chain is internationally competitive and environment friendly.

3 Main Objective

The timber market situation has changed significantly since the development of the Swiss National Forest Programme (2004). Within a period of two years, demand for Swiss wood increased strongly. The majority of the forecasts predict strong demand for the raw material wood in the future. This development would further intensify the competition for the raw material.

Thus, the aim of the Swiss National Forest Programme to increase the demand for wood and wood products must, therefore, be adapted to the altered market conditions. The new issues that arise as a result of this development are addressed in the context of the wood resource policy. They can be generally summarised in two questions: the first concerns the forest and forestry sector in particular while the second applies to all matters extending from the forest boundary to the entire wood value-added chain.

1. How much wood can the Swiss forest supply sustainably on an annual basis? The term "sustainably" is understood to mean here that the supply is economically viable and environmentally friendly, the productivity of the location is conserved and all forest functions can be fulfilled.
2. What form does the resource-efficient allocation of the raw material wood take from a political and economic perspective?

Based on these questions, the following main aim for the wood resource policy has been formulated:

The supply of wood from Swiss forests is sustainable and its use is resource-efficient.

Sustainable wood supply means the an approach to the exploitation of the wood production potential of the Swiss forest that takes the economic, ecological and social requirements of wood utilisation into account. The resource-efficient use of wood should enable the creation of the maximum possible value from one m³ of wood and the simultaneous minimisation of environmental impacts throughout the entire lifecycle. The cascade use of the raw material is, therefore, a fundamental aim in this context.

The principles of the free market economy are important pillars of the wood resource policy which should not be overridden. Thus, forest owners are basically free to decide whether and how much wood they utilise. How wood is used remains a question of marginal willingness to pay.

4 Objectives

The wood resource policy defines six objectives. Quantitative targets are defined for objectives 1 to 3. These reflect the current status of knowledge, which should be checked regularly and updated.[11] In

[11] For example, a study is underway until early 2009 on the development of wood supply and demand in the future and the determining parameters; the parameter relating to wood utilisation potential should be examined in detail by the end of

accordance with the main aim of the wood resource policy, the processes associated with all quantitative targets should always be implemented in a resource-efficient way. The timeframe for the fulfilment of the objectives extends to 2020.

Table 1 Objectives with indicators and targets values, timeframe to 2020

Objective		Indicator	Target value
1	**The sustainably utilisable wood production potential of the Swiss forest is exploited to the full by an efficient Swiss forestry sector.**	Volume of wood utilised (national level)	Exploitation of the wood utilisation potential in a range of 8–8.5 million m³/year (compact wood, including bark and branch brushwood; derived from annual increment)[12]
2	**Demand for material wood products in Switzerland grows. The proportion of wood in Switzerland's building stock increases in particular.[13]**	Per-capita consumption of sawnwood and wood derivatives	20% increase in the per-capita consumption of both sawnwood and wood derivatives • Sawnwood: from 0.24 m³/per capita (2006) to 0.29 m³/per capita (2020) • Wood derivatives: from 0.09 m³/per capita (2006) to 0.10 m³/per capita (2020)[14]
		Proportion of wood in the entire Swiss building stock (new buildings and *"Bauen im Bestand"*[15])	50% increase in the proportion of wood in the entire Swiss building stock (new buildings) • SFD: from 11.4 % (2005) to 17 % (2020) • MFD: from 3.6 % (2005) to 5.5 % (2020)[16]
3	**The energetic use of forest fuel wood, slash and waste wood[17] increases.**	Volume of forest fuel wood utilised	Exploitation of forest fuel wood utilisation potential in the range of 2.7–3.2 million m³/year (compact wood, including bark and branch brushwood; derived from annual increment)[18]
		Volume of waste wood that stays in Switzerland for recycling	50% increase in proportion of waste wood that stays in Switzerland from approx. 400,000 t (2005)[19] to 600,000 t (2020).
4	**The resource wood is subject to multiple and cascade use.**	Proportions of different categories of timber used	
5	**The capacity of the wood value-added chain for innovation increases.**	Research capacity (human resources, finance), patents, awards	
6	**Coordination with other relevant sectoral policies and actors is guaranteed.**		

2009. The targets of the wood resource policy will, therefore, be re-examined on the basis of the new insights from this research and updated where necessary.

[12] Cf. Bundesamt für Umwelt (BAFU) 2008 (c).

[13] This refers to residential and commercial buildings, public buildings, new builds and renovated structures.

[14] Cf. Bundesamt für Umwelt (BAFU) 2008 (a).

[15] The data available up to now on the proportion of wood used in the "*Bauer imp Be stand*" sector (i.e. conversion and redevelopment of existing buildings) has been insufficient to enable the specification of the volume of wood used. This matter is due to be considered as part of the wood action plan.

[16] Cf. KMU Zentrum Holz 2006. The proportion of wood specified represents the ratio of new timber-framed single family dwellings and multi-family dwellings in relation to the total volume of SFDs and MFDs constructed in Switzerland.

[17] Definition of waste wood/used wood: wood that has already been used for a particular purpose and is available for the next use cycle.

[18] Cf. Bundesamt für Umwelt (BAFU) 2008 (c).

[19] Cf. Aussenhandelsstatistik, BFS (foreign trade statistics, Swiss Federal Statistical Office).

Explanation of the objectives

Objective 1

The sustainably utilisable wood production potential of the Swiss forest is exploited to the full by an efficient Swiss forestry sector.

Against the background of concerns about energy supply and climate change, the utilisation and use of the resource wood has increased considerably in recent years. Thus, the economically viable and environment-friendly exploitation of the wood production potential of the Swiss forest represents a challenge for the future. A need for action also exists from a silvicultural perspective due to the accumulation of growing stock in recent decades. An increase in the utilisation of wood contributes to the regeneration of the forests, a more balanced age-class structure and, hence also, greater forest stability. As a result the safeguarding of the protective function of the forest can also be improved.

According to the available data, when considered from the perspective of annual increment, the sustainably utilisable volume of raw wood available in Swiss forests was not exploited to the full. Thus, the preliminary findings of the third Swiss National Forest Inventory (LFI 3)[20] show an – albeit small – increase in the total stand volume of 3% to 420 million m³ (stemwood with bark) over the past 11 years. Of the annual gross increase (including ingrowth) of 9.5 million m3 (stemwood with bark), around two thirds were utilised each year (6.4 million m3, stemwood with bark). Approximately 24% (2.3 million m3/year) of the increment died or was no longer available in the uptake areas due to natural events, e.g. windthrow or rockfall (mortality). The mortality volume arising from Storm Lothar and its follow-on damage, in particular, is considerable. However, it must be remembered that a part of this mortality volume can be utilised and used.

In the light of these data and taking into account the societal, ecological and economic requirements of the forest and wood utilisation, an annual wood utilisation potential of approximately 8.0 – 8.5 million m³ was calculated on the basis of LFI 3[21], which can be utilised sustainably in relation to increment. In the context of the implementation of the formulated objective, it must, however, be noted that the wood utilization potential is not equally distributed in terms of tree species, timber categories and regions. Thus, in relation to tree species, the unutilised potential exists in particular in the area of deciduous wood; in terms of wood categories it is found in the area of fuel wood; and in relation to regions, the potential for greater utilisation exists in the pre-Alps and Alps where the cost of wood utilisation is higher than in other regions. LFI 3 revealed, for example, a 22% reduction in the stand volume of the economically popular spruce species in the easily-accessed Central Plateau region over the past ten years. Thus, based on the calculations, an annual potential of approximately 3.5 million m³ (based on increment) is specified for coniferous roundwood.

Whether or not the theoretically utilisable potential is actually utilised is ultimately the decision of the forest owner. The problem of marginality should be noted in this context. This constitutes an important cause of the low level of wood utilisation by private forest owners in particular: in the smallest of plots, whether the forest is utilised or remains unlogged makes little financial difference to the owner. Although the public forestry operations are bigger and utilise more wood, here too, the plot sizes are often to small to allow their autonomous efficient management by the forestry operation alone.

According to the Federal Act on Forests, the state must ensure that forests are managed sustainably (ForA, Art. 1, 20), and this also involves the consideration of all of the different interests in the forest. Thus, the task of defining the parameters that will guarantee a stable, healthy and productive forest in the long term arises in the context of the wood resource policy. The state must pay particular attention to the long term perspective here and what constitutes optimum development in economic terms. The

[20] Cf. Bundesamt für Umwelt (BAFU) 2007.
[21] Cf. Bundesamt für Umwelt (BAFU) 2008 (c).

question as to how much wood from Swiss forests can be provided annually in the different regions and on a sustainable basis is currently being examined by the research project "*Holznutzungspotential im Schweizer Wald*" ("Wood Utilisation Potential in the Swiss Forest") under the aegis of FOEN. The target value of 8.0–8.5 million m³ currently specified in this publication will be verified on the basis of the findings of this project which are expected to be available in late 2009.

Objective 2

Demand for material wood products in Switzerland grows. The proportion of wood in Switzerland's building stock increases in particular.

Approximately 45 % of end energy use in Switzerland is accounted for by heating and cooling processes, the construction of buildings and hot water production.[22] Thus, the construction sector is one of the most resource-intensive sectors and also makes a considerable contribution to the emission of pollutants that have a detrimental impact on the environment and the climate. Thus, in view of the current and future challenges in the areas of climate and energy, sustainable construction techniques that conserve resources are extremely important. Because wood is a renewable and climate-neutral raw material that can be used to replace more energy-intensive materials, wood can make an important contribution in this context as a construction and compound material. The obvious advantages of timber construction include its greater pre-fabrication capacity and its easy adaptability to existing structures, factors which are gaining in significance in the context of the growth in the modernisation and renovation sectors. The fact that fundamental potential exists for increasing the consumption of wood is demonstrated, for example, by Switzerland's neighbour Austria where the per-capita consumption of sawnwood and wood derivatives is 0.84 m3 (2006) and the proportion of timber structures in the building stock is 33% (2003).[23]

Combined with the numerous conflicts of interests, the fragmented structure of the Swiss forestry and timber sectors is responsible, *inter alia*, for the fact that it has not been possible up to now to carry out comprehensive research and development projects and targeted campaigns for the promotion of wood as a construction material, raw material and energy source with a view to generating stable demand in Switzerland without the support of the state. Moreover, reservations still exist on the part of customers with respect to the durability of wood as a raw material ("it burns, rots"). Against this background, the strong increase in the demand for wood at international level and the expected positive future development in this regard are no guarantee of a growth in the demand for wood products and their use in Switzerland.

Objective 3

The energetic use of forest fuel wood, slash and waste wood increases.

Fossil fuels are finite resources and affect the climate. In view of these characteristics, it should be aimed to achieve the maximum possible substitution of fossil fuels by renewable climate-neutral fuels. Of the available renewable energy sources, biomass and wood display considerable potential in this regard. An added advantage of wood as an energy source is its decentralised availability; as a result it can contribute to value creation in rural areas.

The 2006 Swiss forestry statistics demonstrate a clear trend for the increased harvesting of wood for energy purposes: compared with 2005, the volume harvested for this purpose in 2006 increased by

[22] Cf. Bundesamt für Energie (BFE) 2007 (a).
[23] Cf. UNECE statistics. Proportion of timber-framed buildings in relation to SFD and MFD, including prefabricated timber houses.

around 13%. Thus, in 2006, the proportion of the total volume of wood utilised accounted for by energy wood reached 25%. In accordance with the wood utilisation potential derived from the increment data, it would be possible to increase the volume of forest fuel wood utilised from around 1.4 million m3 (2006) to around 3.2 million m3/year (including bark and branch brushwood).[24] In addition, the utilisation of slash (wood originating from outside the forest) and the recycling of waste wood offer further potential for energy generation. However, a considerable proportion of the waste wood generated in Switzerland is exported to Italy, mainly for material recycling.

Due to their limited availability, the specified wood resources are far from being able to meet the existing energy requirements. For this reason, fuel wood must be supplied in as efficient a way as possible and with maximum efficiency and with a maximum substitution effect in relation to fossil raw materials. The Swiss Confederation's energy-policy position gives top priority to the efficient and clean production of heat, second priority to the production of heat and electricity with a high level of efficiency or annual use efficiency and third priority to the supply of motor and combustible fuels.[25]

Nutrient management is particularly important in the context of sustainable forest management. All wood harvesting, and in particular the removal of fuel wood, represents a loss of nutrients from the forest ecosystems. Further in-depth studies are required to enable the assessment of the scale of nutrient loss through intensified wood utilisation and the associated effects on the sustainability of forest management.

Objective 4

The resource wood is subject to multiple and cascade use.

The material flows of wood are usually controlled by the market and hence by the relevant marginal willingness to pay of purchasers. Thus the market basically assures efficient allocation from an operational perspective but not necessarily the economically, political or socially desirably distribution of the resource. Therefore the approach involving a resource-efficient use cycle (= cascade and multiple use) has not been sufficiently exploited up to now. The hitherto insufficient material (re-)use of waste wood in Switzerland may be cited as an example in this context.

Cascade and multiple use in this context means that wood use should begin with the type of use that yields the highest value-added, generates the greatest benefit in ecological terms and accommodates multiple use. The material use of categories of wood, which can be used both for both material and energy purposes, generally yields better values in terms of the aforementioned "cascade criteria". The situation would have to be re-evaluated if an "energy crisis" caused a significant increase in the price of fuel wood and the value-added (CHF per t wood) from energy would increases considerably. However, it should basically be noted that the material cycle offers the possibility of multiple use: i.e. the creation of value first through the material use cycle and through energy use at the end of the material life cycle. In terms of the contribution to the reduction in CO2 emissions, studies have shown that cascade use provides more positive CO2 effects than direct energy use.[26]

The proportion of the categories of timber (roundwood, industrial wood, fuel wood) in relation to all of the wood utilised as manifest under previous market conditions could be used as an indicator in relation to this objective. Based on this, the following timber category distribution should not change significantly: roundwood: 50 %, industrial wood 12 %, fuel wood 38 %. The distribution was derived from the wood utilisation potential.[27] Due to the inclusion of bark and branch brushwood in the wood

[24] Cf. Bundesamt für Umwelt (BAFU) 2008 (c). It should be noted here that the derivation of the wood categories was established on the bases of empirical values from the forestry statistics, however the shares relating to the different categories can vary considerably according to the price situation.
[25] Cf. Bundesamt für Energie (BFE) 2002.
[26] Cf. Taverna R. et al. 2007. Hofer P. und Richter K. 2002.
[27] Cf. Bundesamt für Umwelt (BAFU) 2008 (c).

utilisation potential, the proportion of fuel wood exceeds that expressed in the forest statistics.[28] The indicator demonstrates the main use stream the wood enters into when first processed and therefore provides an indicator for the consideration of the cascade approach.

Objective 5

The capacity of the wood value-added chain for innovation increases.

Innovation stands for permanent development, the ongoing introduction of new processes, products and services, organisational and management systems, and for successful marketing and the accessing of new markets. In globalised markets, it becomes 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.

Due to the characteristically small-scale structure of the Swiss forestry and timber sectors, the necessary investment in research and development cannot be made by the companies and operations themselves. Thus, as part of the wood resource policy, a contribution should be made to creating positive preconditions for innovation services involving, for example, the support of research and development and knowledge transfer and innovation-friendly operating conditions.

The indicators for this objective are: research capacity (human resources, finance), number of patents, number of awards.

Objective 6

Coordination with other relevant sectoral policies and actors is guaranteed.

The utilisation and use of the resource wood affects many other sectoral policies. Therefore, intensive coordination and cooperation between the different stakeholder groups is essential. With this in mind, FOEN supports trusting and coordinated collaboration with the other federal authorities, the cantons, the forestry and wood sectors, and science and research.

[28] The percentages for the different wood categories in relation to total utilisation as recorded in the 2006 forestry statistics are: roundwood wood 63%, industrial wood 11%, fuel wood 25%. Cf. Bundesamt für Umwelt (BAFU) 2008 (a).

5 Wood Action Plan

The wood action plan, which is initially defined for four years (2009-2012), specifies the priority measures and proposed target groups of the wood resource policy. It defines the services to be provided by the Federal Office for the Environment (FOEN) which are seen as necessary in contributing to the fulfilment of the formulated objectives.

The implementation of the wood resource policy in the context of the wood action plan is a joint task to be undertaken by the Confederation and its partners. These partners include, in particular, the cantons and the forestry and wood sectors. 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 achievement of the defined objectives.

Principles

The wood resource policy and the associated wood action plan constitute a direct contribution to the implementation of the Federal Council's strategy for sustainable development in Switzerland, the implementation of which is binding on all authorities.[29] The wood resource policy contributes in particular to the key challenges of "climate change", "renewable energies" and "the use of natural resources" defined in the strategy.

The legitimation for state initiative in the context of the wood resource policy is based on the Federal Act on Forests. The support of efficient wood supply contributes to sustainable forest management (Cf. ForA. Article 1, 20). The promotion of resource-efficient wood use is based on Articles 31 (research and development), 33 (surveys), 34 (information) and Article 38a (management of the forest).

All state promotional measures should be based on economic principles. In addition to this, national political concerns (public interest) always constitute an important component of promotional policies. In accordance with the Federal Swiss Constitution (Article 103), state promotional instruments may also be requested on the basis of a political assessment, if the self-help measures of the private actors involved can be deemed insufficient to deal with economic structural change. Thus promotion is located 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 be conceived in a way that minimises the distortion of competition.

Overall, the state initiative in the context of the wood action plan focuses on accompanying and supporting instruments which create the preconditions and bases necessary for the fulfilment of the formulated objectives. These include in particular:

- Information (base data and decision-making bases)
- Consultancy and awareness-raising
- (Applied) research and development
- Education/further training and knowledge transfer
- Coordination and consultation
- Regulative instruments (laws, standards, incentives)

The measures proposed in the action plan constitute a mix which should contribute to, first, the elimination of significant inhibitive factors in the wood value-added chain that represent an obstacle to the efficient allocation of the resource, and, second, the further development of the strengths of the forestry and timber sectors. Significant emphasis is attached to the transfer of existing knowledge or

[29] Cf. Schweizer Bundesrat 2008.

knowledge still to be researched to the operations and companies within the forestry and timber sectors.

The design and organisation of the measures take into account the different conditions prevailing in the forestry and timber sectors. Up-to-date data and decision-making bases and the provision of information to and raising of awareness among forest owners constitute an important field of action in relation to the desired increase in the efficient supply of wood. Activities that affect the structures and processes in the forestry and timber sectors are implemented in coordination with service agreements in the context of the New Fiscal Equalisation (NFA). Synergies are expected particularly in relation to the cooperation with SECO's New Regional Policy.

The measures formulated in the wood action plan in relation to the timber sector are not primarily aimed at direct structural improvement. This is the task of the market. Instead, the wood resource policy contributes to the strengthening of innovation and competitive capacities (research and development, education/further training, knowledge transfer). Another focus area of a cross-sectoral nature is the logical coordination with other sectoral policies and actors with a view to reinforcing the effects of the individual measures.

The following summarised principles apply to the implementation of the wood resource policy:

> **Joint task**
The objectives of the wood resource policy can only be achieved if all of the relevant actors contribute to the process. Thus, the implementation of the measures defined in the wood action plan represents in particular a **joint task shared by the Confederation, Cantons and the forestry and wood sectors**.

> **The Confederation – strategic role**
The Confederation coordinates the implementation of the wood resource policy, which involves a large number of actors. It highlights the future challenges in relation to the utilisation and use of the resource wood and provides information and the necessary decision-making bases (knowledge transfer).

> **Spotlight on focal areas**
The resources available for the implementation of the wood resource policy are limited. Thus, the available resources are concentrated on the measures and instruments which can make a maximum contribution to the fulfilment of the objectives within the framework of the available legal options (principle of efficiency).

> **Rolling planning**
The wood resource policy is conceived as an open and dynamic policy which, therefore, 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 wood resource policy should not result in the creation of additional state regulations and provisions that have a direct influence on competition. Thus, the focus of the measures and instruments lies on the pre-competitive and sector-wide context.

6 Priority Measures

This chapter presents the priority measures of the wood action plan in greater detail. To begin the priority measures are outlined with the corresponding field of action. They are then listed in Table 3 with the corresponding target groups. The services for which FOEN assumes responsibility in the context of the implementation of the wood action plan are also defined. Some of the topics which are considered as particularly important are further consolidated and presented in keyword form. The list should not, however, be considered as final.

Programmes and projects which have a substantial connection to the priority measures of the wood action plan are also presented (cf. Table 3, column “Interface with other programmes and projects”). This provides an important aid for ensuring that the best possible use is made of the synergies between the various projects during the concrete project design and organisation phase.

Table 2 Priority measures with description of the associated action field

Base data (wood supply, wood potential, cascade use) Uncertainties exist among buyers with regard to the volumes of roundwood currently available and expected to be available in the future (tree species, timber categories, regions). There is a lack of clarity, in particular, regarding the raw wood potential from within and outside forest that can be provided in future for heat generation and, possibly, chemical use. From the perspective of the forestry sector, uncertainties exist above all in relation to “suitable” reserves, the maintenance of site productivity (nutrient discharge) and wood utilisation potential in the context of sustainable forest management. With the increasing demand for the raw material wood as both a material and energy source, use rivalries are increasing. Well-founded decision-making bases are required to facilitate the assessment of the optimum material flows or wood life cycles as a contribution to sustainable development and the correct use of incentives. Considerable research is still required in this area (LCA, cascade use).
Provision of information to and raising of awareness among forest owners (wood mobilisation) The Swiss forestry sector is characterized by its small-scale structure. Due to the very small forest areas, in many cases forest ownership is of little economic interest (problem of marginality). In many cases, the necessary expertise and equipment for efficient timber production are also lacking. Thus, wood utilisation is not carried out in many forests and relatively extensive wood stocks can be found in private forests in particular. Experience from both at home and abroad shows that in the case of small-scale forest ownership (private and public), higher wood prices do not necessarily give rise to increased wood utilisation. The raising of awareness among forest owners through the provision of balanced information on the repercussions and effects of actions in the forest should contribute to sustainable forest management. Forest professionals with the relevant training are required to reach the highly heterogeneous forest ownership clientele.
Provision of information to and raising of awareness among the population (forest – functions – wood utilisation) Many wide-ranging demands are made of the forest. The forest is strongly rooted in the minds of the Swiss population as a recreational area. Recreation and wood utilisation take place in the same space. Thus, the forest becomes an open production site where every citizen can keep track of the wood harvesting measures. However, a knowledge deficit exists within the Swiss population in relation to the need for and purpose of wood utilisation. As a result the public is often critical of or concerned about increased wood utilisation.

Deciduous wood use (research and development, innovation promotion, knowledge transfer)

A comparison of the living tree stocks recorded in LFI 2 and LFI 3 reveals a clear shift in favour of the proportion of deciduous trees in Swiss forests. A significant increase in the deciduous wood supply in Switzerland may also be expected in the future. This reflects the conversion of forests to more mixed and deciduous stands that are suited to their locations and rich in structure – a development promoted by forest policy . The opportunities that existed hitherto for the sale and use of deciduous wood have not been sufficient to enable the optimal use of the increasing deciduous wood potential based on the cascade approach. Thus it is essential that new markets be accessed and successful products based on native hardwood be developed. Due to the characteristic small-scale structure of the Swiss forestry and timber sectors, it is often impossible for companies and operations to make the necessary investment in research and development.

Further development of energy-efficient and high-volume timber construction systems in specific areas, "Bauen im Bestand" (research and development, innovation promotion, knowledge transfer)

A considerable need remains for application-oriented knowledge in key areas of timber construction. These areas include, in particular, noise protection, structural fire protection, energy-efficient building/building components, mixed building methods and quality assurance in timber construction. Further developments in these areas are creating additional market potential, in particular in multi-story space-saving timber construction. In addition, there is a need to transfer the existing and available knowledge to the key multipliers.

Raising of the awareness of institutional end users (timber-framed structures, wood construction components, wood energy)

Public buildings can trigger signal effects among (major) private investors. Thus the role of advocacy among public clients, (major) investors in the construction sector and banks, as the main "co-financers" of construction projects, in relation to the potential and advantages of timber-framed buildings or mixed buildings and the use of wood energy should not be underestimated. This is particularly important against the background of the wide-ranging reservations that still exist in relation to the durability of the raw material wood and the resulting ignorance of its potential uses.

Design and organisation of framework conditions, coordination with partners

The utilisation and use of the resource wood also involves numerous other sectoral policies. Thus, intensive coordination and consultation with the different stakeholder groups is necessary for the successful implementation of the wood resource policy. Existing forums and committees, in particular, should be adequately used for this purpose.

Table 3 Overview of the priority measures of the wood action plan

Priority measure	Involves objective	Target Groups	Service provided by FOEN[30]	Interfaces with other Programmes and Projects[31]
Base data	1, 3, 4	All actors involved in the wood value-added chain: particularly forestry, timber and energy sectors, public decision-making bodies, private investors	Applied research and development, support for knowledge transfer, processing and publication of the relevant data • wood supply, wood utilisation potential, utilisation strategies, effects of increased wood utilisation, development of wood supply and demand • optimal lifecycle of wood as material and energy source (LCA, eco-balances) Implementation: concrete project commissions by FOEN (“top down”)	• LFI standard evaluation, forest statistics • Forest fuel wood map WSL • Basic requirements for ecologically adapted silviculture • Biomass strategy FOEN, SFOE, FOAG • SFOE: Renewable Energies Action Plan, wood energy sector, R+D • Energy management basics • http://www.ecoinvent.org/de/ • Wood Fibre 2020 • FBL: KBOB • SIA standards
Provision of information to and raising of awareness among forest owners (wood mobilisation)	1, 3	Forest owners (public and private), forestry service, forestry operations	Development of innovative consultancy concepts, training of forest rangers Implementation: project inputs (“bottom up”)	• NFA programmes “Forestry Sector”, “Biodiversity in the Forest” • Basic requirements for ecologically adapted silviculture • holz21 mobilisation programme (follow-on) • Wood Fibre 2020 • Research programmes: WSL, universities
Provision of information to and raising of awareness among (forest – functions – wood utilisation)	1, 3	Population	Information and awareness-raising on the topic of “increased wood utilisation – reasons and effects – coordination with other forest functions” Implementation: concrete project commissions by FOEN (“top down”)	• Communication sectoral associations • Wamos socio-cultural forest monitoring (in preparation)

[30] The presented aspects show the topics within the priority measures which are regarded as important but should not be viewed as complete.
[31] The list reflects the current status of knowledge and does not make any claim to comprehensiveness. New programmes and projects are taken into account correspondingly.

Priority measure	Involves objective	Target Groups	Service provided by FOEN30	Interfaces with other Programmes and Projects31
Deciduous wood use (research and development, innovation promotion, knowledge transfer)	1,5, 4	Timber sector, private investors	Applied research and development, innovation promotion and support for knowledge transfer and the implementation in application-oriented principles for practice • New uses and applications for hardwood Implementation: concrete project commissions by FOEN (“top down”); project inputs to WHFF (“bottom up”)	• Wood Fibre 2020 • SECO New Regional Policy
Further development of energy-efficient and the use high-volume timber construction systems in specific areas, “Bauen im Bestand” (research and development, innovation promotion, knowledge transfer)	2, 5, 4	Timber construction, timber sector, planners, designers, architects (clients)	Applied research and development, innovation promotion and support for knowledge transfer and for the implementation in application-oriented principles for practice • fire and noise protection, energy-efficient building, building components, mixed building methods, timber as material for Bauen im Bestand (renovation, redevelopment, conversion and extension) • lighthouse projects Implementation: project inputs (“bottom up”)	• SFOE: Renewable Energies Action Plan, buildings sector, “Energy in Buildings” research programme • Wood Fibre 2020 • Activities of Lignum (timber sector umbrella organisation)
Raising of the awareness of institutional end users (timber-framed structures, wood construction components, wood energy)	2	Institutional clients, investors, public decision-makers	Information and awareness-raising, provision of decision-making bases (knowledge transfer) Implementation: project inputs (“bottom up”)	• SFOE: Renewable Energies Action Plan, buildings sector; Minergie, cantons • FBL: KBOB • Activities of Lignum (timber sector umbrella organisation), Universities of Applied Sciences

Priority measure	Involves objective	Target Groups	Service provided by FOEN30	Interfaces with other Programmes and Projects31
Design and organisation of framework conditions, coordination with partners	1–6	State (Confederation, cantons), legislatures, ll actors in the wood value-added chain: particularly forestry, timber and energy sectors, environmental organisations	Review of and participation in the adaptation and implementation of legal provisions; provision of decision-making basis and coordination with relevant partners on wood-related topics	• Biomass strategy FOEN, SFOE, FOAG • FOEN: climate policy, Kyoto Protocol from 2012, partial revision OMW • Action plans (SFOE): renewable energy sources, energy efficiency (buildings) • New Regional Policy SECO • LRV implementation • NCHA, UZL • FBL: KBOB • SIA standards • Public Private Partnership (PPP) • General coordination of the sector in the context of Lignum; raw material summit of the timber industry

7 Finance and Organisation

FOEN has earmarked CHF 16 million for the wood action plan in its financial planning for the next four years – subject to budget cuts by the Federal Council and parliament. Thus, the anticipated annual sums are CHF 4 million; these can, however, be adapted to the resource requirements. The provisional allocation of the financial resources to the priority measures is based, first, on the results of the evaluation of the *holz 21* wood promotion programme. Second, the Confederation undertook a priority-setting process which is based on the objectives of the wood resource policy, the biggest deficits and the greatest expected effect. This may be adapted according to the cost of the concrete projects and development of the action plan.

The financial contributions of the partners are taken into account in the definition of the projects. Depending on the process, these shall represent at least 50% of the costs (subsidies in accordance with Art. 38a ForA).

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 given the long-term perspective and consideration of the various societal interests in the forest and the raw material wood.

FOEN will fulfil the function of programme monitoring. An advisory group comprising representatives of the SFOE and SECO, the cantons and the forestry and timber sectors will provide expert support for the programme monitoring. FOEN is also responsible for the programme management. It is responsible for the orderly implementation of the wood action plan.

Annex

Interfaces: potential synergies and tensions

The following two tables present the potential synergies and tensions between the wood resource policy and other sectoral policies in detail.

Table 4 Potential synergies and tensions between forest interests and wood utilisation interests

Forest Interests (forest policy)	**Wood Utilisation Interests** (wood resource policy)	
	Potential Synergies with increased wood supply	**Potential Tensions** with increased wood supply
Protection against natural hazards	• Increased wood utilisation makes an important contribution to the greater stability of the forests, particularly in poorly structured over-aged stands.	• Fears that increased wood utilisation in the protective forest will hinder the protective function.32
Recreation and leisure	• The population values well maintained, varied, well-lit and “tidy” forest images.	• Fears of forest destruction generate opposition to increased utilisation in the Swiss forest among the population.33
Biodiversity – basic requirements of ecologically adapted silviculture 34	• Regular wood utilisation creates structural diversity and hence also biological diversity.	• Fears that increased wood utilisation will result in the harvesting of a greater number of old trees and dead wood, which represent important habitats, or that the creation of nature reserves with limited utilisation will be hindered. • Fears that the increased removal of entire trees would lead to a greater loss of nutrients in the soil.
Forest as CO2 sink	• Forest sink services are limited. As opposed to this, an enduring contribution to climate protection can be made through increased wood utilisation, in particular through the substitution effect.	• The maximum possible accounting of sinks in the Swiss forest would involve an increase in standing volume and growing stocks. This stands in the way of increased wood utilisation, which also involves a reduction in standing volumes and growing stock as a possible variant.

[32] It should be noted that increased wood utilisation is referred to here in the context of the Federal silvicultural guideline for the maintenance of protective forests (NaiS).
[33] Increased letters from citizens as an indication of the population’s unease in relation to increased utilisation.
[34] The basic requirements of ecologically adapted silviculture constitute an ecological safety net and are currently being developed under the management of FOEN.

Table 5 >Potential synergies and tensions between other sectoral policies and the wood resource policy

Sectoral Policies and their Objectives	**Potential Synergies** with the Wood Resource Policy	**Potential Tensions** with the Wood Resource Policy
Energy policy		
Rational energy use Increased proportion of renewable energy sources used	• Promotion of renewable resources, including the raw material wood	• Fears that the promotion of the energetic use of wood by energy policy is not coordinated with the objective of the resource-efficient use of wood (cascade use).
Climate policy		
Reduction in CO2 emissions Reduced consumption of fossil fuels	• Wood is climate neutral and binds CO2 in wood products in the long term. • Wood can replace fossil fuels and oil-based materials in many areas. The consumption of fossil fuels can be reduced as a result.	• An excessively strong focus on the forest sink service would hinder increased wood utilisation.
Regional and economic policy		
Strengthening of the innovative power and competitiveness of the regions	• The forestry and timber sectors represent an important economic factor in the regions.	• An excessive focus on the protective interests would conflict with the predominantly economic interests of regional and economic policy.
Agricultural policy		
Safe and ecologically-sound food supply; maintenance of the man-made cultivated landscape; decentralised settlement	• Regular forest management contributes to landscape management. • Good framework conditions for the forestry sector provide an additional income for farmers with forest property.	• In regions with good conditions for agricultural production, forest areas compete with agricultural areas in particular.

Reference Material

Glossary

Bauen im Bestand

Maintenance, redevelopment, renovation, modernisation, energy-based improvement and conversion of existing buildings.

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, residues and waste, the energy content of which originates from the biomass.

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)."[35]

Forest fuel wood

Generally small-diameter wood, which cannot be put to material use due to small diameter and qualitative faults, and forest waste wood which includes crown wood and roundwood and branchwood that cannot be put to material use.

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 human decision-making arenas even 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). The natural resources also include clean air, natural diversity and quiet.

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.

Resource economics

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

[35] Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz 2008.

Resource efficiency	Resource efficiency expresses the ratio of value-added (e.g. from a wood product) to the use of the resource necessary for the generation of the product in question.
Resource policy	FOEN uses the term resource policy synonymously with environmental policy. Resource policy controls access to natural resources and, hence also, their use.
Resource productivity	Resource productivity expresses the (volume) ratio of products (output) to the resources used (input) in the production process.
Slash	Wood that arises outside the forest.
Sustainability[36]	"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)."
Economic viability	> Conserve income and employment and correspondingly augment needs while taking social and spatially sustainable distribution into account > Conserve a minimum of and qualitatively increase productive capital based on social and human capital > Improve the competitiveness and innovative strength of the economy > In the economy, primarily allow market mechanisms (prices) to take effect while taking important scarcity factors and external costs into account > Economic management by the state that does not take place at the cost of future generations (for example, debts, neglected maintenance of value)
Ecological responsibility	> Conserve natural areas and species diversity > Maintain the use of renewable resources at a level below the level of regeneration or natural occurrence > Maintain the use of non-renewable resources at a level below the development potential of renewable resources > Reduce the impact of pollutants on the natural environment and people to a negligible level > Prevent or reduce the effects of environmental disasters and only accept accident risks to the extent that the damage caused by a maximum damage event cannot extend beyond one generation

[36] Schweizer Bundesrat 2008.

Societal solidarity	> Protect and promote the health and safety of people comprehensively > Guarantee the education and hence development, fulfilment and self-identity of the individual > Promote culture and the conservation and development of societal values and resources in the sense of social capital > Guarantee equal rights and legal certainty for all, in particular equality between men and women, the equality or protection of minorities and the recognition of human rights > Promote solidarity within and between generations and at global level
Swiss National Forest Programme, Vision, Wood Value-Added Chain Section	"Wood features prominently in Swiss architecture and lifestyles. The value-added chain from the tree to the end product is internationally competitive and capable of meeting the growing demand for wood from Swiss forests. Favourable conditions exist for the competitive use and processing of wood and for the creation and maintenance of a healthy wood market"[37]
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.
Wood supply	Includes timber harvesting and supply up to the purchaser.

[37] Bundesamt für Umwelt, Wald und Landschaft (BUWAL) 2004 (b).

List of Acronyms

BTL	Biomass to liquid
HES	*Holzenergie Schweiz* (Wood Energy Switzerland)
FOAG	Federal Office for Agriculture
FBL	Federal Office for Buildings and Logistics
FOEN	Federal Office for the Environment
ForA	Federal Act on Forests
FTP	Forest-based Sector Technology Platform
KBOB	*Koordination der Bau- und Liegenschaftsorgane des Bundes* (Office for the Coordination of Federal Construction Projects and Properties)
LCA	Life Cycle Assessment
LFI	Swiss National Forest Inventory
MFD	Multi-family dwellings
NaiS	*Nachhaltigkeit im Schutzwald* (Sustainability in the Protective Forest)
NCHA	Federal Act on the Protection of Nature and Cultural Heritage
NFA	New system of financial equalisation and division of tasks between the Confederation and the cantons
OAPC	Federal Ordinance on Air Pollution Control
OMW	Ordinance on Movements of Waste
SECO	State Secretariat for Economic Affairs
SFD	Single-family dwellings
SFOE	Swiss Federal Office of Energy
SFSO	Swiss Federal Statistical Office
SIA	*Schweizerischer Ingenieur- und Architektenverein* (Swiss Association of Engineers and Architects)
SRA	Strategic Research Agenda
UZL	*Umweltziele Landwirtschaft* (Environmental Targets for Agriculture)
VKF	*Vereinigung Kantonaler Feuerversicherungen* (Association of Cantonal Fire Insurance Companies)
WHFF	*Wald- und Holzforschungsfonds* (Forest and Wood Research Fund)
WSL	Swiss Research Institute for Forest, Snow and Landscape

Bibliography

Berner Fachhochschule Architektur, Holz und Bau: Innovations-Roadmap 2020 für die Schweizer Holzwirtschaft. Schlussbericht. Träger: Lignum, Netzwerkholz, Bundesamt für Umwelt (BAFU). Dezember 2007. (*http://www.bafu.admin.ch/wald/*, WHFF Schlussberichte).

Bundesamt für Energie (BFE): Energieperspektiven 2035. Bern. 2007 (a).

Bundesamt für Energie (BFE): Aktionsplan Energieeffizienz. Bern. September 2007 (b)**.**

Bundesamt für Energie (BFE): Aktionsplan Erneuerbare Energien. Bern. September 2007 (c)**.**

Bundesamt für Energie (BFE): Positionspapier Holzenergie. 2002.

Bundesamt für Umwelt (BAFU) (Hrsg.): Jahrbuch Wald und Holz 2007. Umwelt-Wissen Nr. 0807. Bern. 2008 (a).

Bundesamt für Umwelt (BAFU): Die Umweltpolitik des Bundes. Grundsätze für die Umsetzung und die Weiterentwicklung. Mai 2008 (b). (Cf. *http://www.bafu.admin.ch/org/ziele/index.html?lang=en*).

Bundesamt für Umwelt (BAFU): Holznutzungspotentiale im Schweizer Wald (Basis LFI 3). Bearbeitung: GEO Partner AG. Januar 2008 (c).

Bundesamt für Umwelt (BAFU): Waldfläche, Vorrat und Laubholz nehmen zu - grosse regionale Unterschiede. Medienmitteilung zum 3. Landesforstinventar. 9. November 2007. (Vgl. http://www.bafu.admin.ch/dokumentation/medieninformation)

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Branchenprofil der Wald- und Holzwirtschaft 2001. Umweltmaterialien Nr. 187. Bern. 2004 (a).

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Waldprogramm Schweiz (WAP-CH) – Handlungsprogramm 2004-2015. Schriftenreihe Umwelt Nr. 363. Bern. 2004 (b).

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Waldprogramm Schweiz. Schwerpunkt sozioökonomische Funktionen. Bericht der Arbeitsgruppe Wirtschaftlichkeit und Forstbetriebe. Bern. 2003. (a)

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Waldprogramm Schweiz. Schlussbericht Schwerpunkt Holznutzung. Bern. 2003. (b)

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Ökonomische Branchenstudie der Wald- und Holzwirtschaft. Umweltmaterialien Nr. 138. Bern. 2001.

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Der Schweizer Wald – eine Bilanz. Waldpolitische Interpretation zum zweiten Landesforstinventar. Bern. 1998.

Bundesamt für Umwelt, Wald und Landschaft (BUWAL): Holz – Rohstoff mit Zukunft, Ziele und Strategien zur Holzförderung, Umweltmaterialien Nr. 33. Bern. 1995.

Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz: Bekanntmachung über die Förderung der angewandten Forschung auf dem Gebiet der nachwachsenden Rohstoffe im Rahmen des Förderprogramms «Nachwachsende Rohstoffe» der Bundesregierung zum Schwerpunkt «Innovative Mehrfachnutzung von nachwachsenden Rohstoffen, Bioraffinerien». 24. April 2008.

Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz: Verstärkte Holznutzung. Zugunsten von Klima, Lebensqualität, Innovationen und Arbeitsplätzen (Charta für Holz). 2002.

Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation (UVEK): Departementsstrategie UVEK. 2001 sowie Ziele der Regierungspolitik. Dezember 2005. (Vgl. *http://www.uvek.admin.ch/* Strategie).

Europäische Kommission: Forest-Based Sector Technology Platform. A Strategic Research Agenda for Innovation, Competitiveness and Quality of Life. Brussels. 2006.

Europäische Kommission: Biomasseaktionsplan. 2005.

Hofer P., Richter K.: Der Gebäudepark der Schweiz als Holzlager und CO_2-Senke. Bundesamt für Umwelt (BAFU). Bern. 2002.

Jaako Pöyry Consulting: Situation und Zukunft der Schweizer Sägeindustrie. Ergebnisse einer umfassenden Struktur- und Potentialanalyse, Förderprogramm holz21 (Hrsg.). Bern. 2004.

Jaako Pöyry Consulting: Erfolgsfaktoren für die Wald- und Holzwirtschaft. Ergebnisse einer richtungweisenden Studie. Förderprogramm holz21 (Hrsg.). Bern. 2003.

Jaako Pöyry Consulting: Logistikstudie Schweizer Wald- und Holzwirtschaft: Analyse zur Identifikation von Rationalisierungspotentialen entlang der Wertschöpfungskette Wald. Freising. 2002.

KMU Zentrum Holz: Wood Monitoring Public. Holz- und Baumarktdaten 2006.

Rat der Europäischen Union: EU-Strategie für Nachhaltige Entwicklung. Juni 2006.

Schweizer Bundesrat: Strategie Nachhaltige Entwicklung: Leitlinien und Aktionsplan 2008-2011. Bericht des Bundesrates vom 16. April 2008.

Schweizer Bundesrat: Botschaft zum Mehrjahresprogramm des Bundes 2008 – 2015 zur Umsetzung der Neuen Regionalpolitik (NRP) und dessen Finanzierung. Nr. 07.000. Februar 2007.

Taverna R., Hofer P., Werner F., Kaufmann E., Thürig E. : The CO2 Effects of the Swiss Forestry and Timber Industry. Scenarios of future potential for climate-change mitigation. Environmental Studies No. 0739. Federal Office for the Environment (FOEN), Bern. 2007]

UBS: UBS-Outlook – Wald- und Holzwirtschaft – Denkanstösse und Thesen zur zukünftigen Entwicklung. UBS AG. Zürich. 2005.

UNECE, FAO: European Forest Sector Outlook Study 1960-2000-2020 – Main Report. United Nations Economic Commission for Europe. Food and Agriculture Organisation of the United Nations. Geneva. 2005.

Waldwirtschaft Schweiz (WVS): 8 Thesen für eine zukunftsfähige Waldwirtschaft. Solothurn. 2003.

http://www.holzwende2020.de