2022 Market Statement for Switzerland
Developments in Forest Product Markets

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New-build refuge centre – a ‘zero-concrete’ project with modular and scalable apartments
(image source: © Prix Lignum – photo by Marcel Kultscher)
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Contributions: Eduard Belser, Journalist specialising in the timber market
Compiled by: Achim Schafer, Swiss Federal Office for the Environment FOEN, Forest Division, Bern

1 General economic trends

1.1 Developments up to mid-2022

In the year under review, the global economy was still a long way off making a complete recovery from the impact of the COVID-19 pandemic, which is still flaring up. Pan-continental transport and supply chains are still experiencing significant disruption. The delivery times and availability of many raw materials and processed products are still a huge issue. Since the last annual report published in autumn 2021, the world, the general political climate and the environment for the forestry and wood industry have changed dramatically, and have deteriorated alarmingly. The treacherous Russian war on Ukraine, which began on 24 February 2022, represented an attack on that nation's independence as recognised under international law. Over a long-term horizon, this will also cause major political and economic upheaval and fundamentally change global trade flows for many years to come. Growing tension between China, Taiwan and the USA as well as other existing and simmering conflicts are a cause for concern and impact on the year under review.

These changes clearly show that a return to manageable, regional economic cycles and reducing dependency on extensive supply chains susceptible to conflict is a well advised policy. Reducing transport routes would also benefit still urgently needed climate protection and help conserve non-renewable resources. These requirements are especially relevant to a small nation like Switzerland which is highly integrated into the global economy. Against the backdrop of these challenges presented by the global situation, it is also vitally important to see an opportunity to return to our own strengths, raw materials and production capabilities and to take advantage of them swiftly and purposefully.

In view of low wood prices and a sharp rise in production costs in relative terms, the economic room for manoeuvre of forestry companies has narrowed over recent decades. The status of wood as a traditional raw and construction material and its processing has also declined in the eyes of society and the politicians who represent it. This is especially true when compared with other sectors, particularly high-tech ones, such as the chemical, pharmaceutical and electronics industries with higher levels of value creation. Trends have changed over recent months. Wood prices are rising sharply because of the resources and energy crisis triggered by the Russian war of aggression on Ukraine. Demand for timber and wood-based products is at its highest level for a long time.

The Swiss domestic economy has recovered strongly since the extensive lifting of health policy measures to contain the COVID-19 pandemic in spring 2022. This is very much the case in the leisure and hospitality sectors, although the labour shortage is holding back growth here. Many workers from these sectors have undergone retraining and moved out of the industry during the restrictions imposed to tackle COVID-19. The favourable development on the labour market, i.e. the low unemployment rate, is supporting private consumer spending, while inflation remains moderate by international standards. Based on the current indicators, the expert group expects the Swiss economy to recover over the course of the year, albeit at a slower pace.

These turbulent conditions and trend reversals have also seen the value of the Swiss franc rise significantly against foreign currencies, especially the euro. This negative development for the Swiss export industry is nevertheless currently still being cushioned by higher rates of inflation in the major trading partner countries, but is resulting in considerable decline in profit in some sectors, such as the railway rolling stock sector and the metal-processing industry in general, despite high order levels.

Overall, the development of and current outlook for the Swiss economy are still reflected by a very low level of unemployment. This was also underlined in a press release issued by the State Secretariat for Economic Affairs (SECO) in August 2022: "The July survey finds consumers are downbeat on the general economic outlook. The assessment of their own financial situation has never been so low, and the propensity to make major purchases is far below average. Meanwhile, perceptions of the labour market remain highly positive."
1.2 Outlook

Over the remainder of the forecast horizon until 2023–24, the impact of the war in Ukraine may be greater than anticipated. The global economic outlook is deteriorating significantly. On the global markets, prices are rising sharply, and not just for major exports from Russia and Ukraine such as energy and commodities as well as some foods and animal fodder.

Forecasts for this and the coming winters indicate that the seasonal electricity and gas shortage could have a negative impact. Relevant measures are being drawn up in response. This will also be a major factor in the Swiss domestic economy, having a negative effect on consumer confidence.

Higher inflationary pressure in the neighbouring eurozone than in Switzerland is also putting strain on demand in key trading partner countries. This is having dampening effects on the export-oriented sectors of the Swiss economy and is expected to have a growing impact in future. Much weaker growth is also predicted in China, where extensive coronavirus measures are still in force.

The ‘solar turbo’ launched by the Swiss Parliament in the September 2022 session to promote renewable energy from photovoltaic systems is still being held back, at least in the initial phase, because of the lack of photovoltaic modules, inverters and trained assembly staff. However, both CO2 emissions and dependence on foreign fossil fuels and electricity imports will be reduced over the medium and long-term.


2.1 Timber trade regulation in Switzerland

With the Ordinance on Placing Timber and Wood Products on the Market, which entered into force on 1 January 2022, the Federal Council – at the behest of the Swiss Parliament – created an equivalent regulation to that of the European Union (EU; EUTR 995/2010). This aims to ensure that no timber or wood-based products illegally felled or traded are placed on the market. Combating illegal felling and trading in timber helps to stem both deforestation and the loss of biodiversity. This helps in the battle against climate change. Further trade barriers between Switzerland and the EU are also to be removed.

(Source: FOEN)

3 Developments in forest products markets

3.1 Overview and general trends

In view of low wood prices and a sharp rise in production costs in relative terms, the economic room for manoeuvre of forestry companies has narrowed over recent decades. The status of wood as a traditional raw and construction material and its processing has also declined in the eyes of society and the politicians who represent it. This is especially true when compared with other sectors, particularly high-tech ones, such as the chemical, pharmaceutical and electronics industries, which have higher levels of value creation.

A trend reversal has nevertheless been evident for some time. Thanks to innovations, particularly in the fields of timber engineering and new wood materials, the timber industry and the forestry sector, as its supplier, are playing a more significant role again. The fact that wood is a regenerative, indigenous and carbon-neutral raw and construction material which can be processed and meet the highest requirements thanks to its properties is gaining increasingly wide acknowledgement. The digitalisation of the timber and wood processing sectors, which has been driven forward over recent years, has also made a major contribution in this respect. This means solutions for highly complex construction tasks have often become decisively more competitive with wood than other construction materials. This is gradually also being appreciated by politicians, a situation the forestry and timber industries should take advantage of in a more targeted way to ensure their voice is heard more loudly at political level.
3.2 Out{2kout
Forecasting in the forestry and timber industries for the coming years has also been complicated by
the current conflicts and more challenging geopolitical situation. From a current perspective, the for-
erestry and timber industries have a major advantage in times of climate change and growing recogni-
tion of wood’s importance as a carbon-neutral, regenerative and indigenous raw and construction ma-
terial. Wood is part of the current trend

The construction industry is a major factor in demand for timber and a slowdown is predicted. How-
ever, demand for living space is not expected to fall due to immigration. Timber-framed construction
has become an even more attractive option compared with rival construction materials recently. The
storage of CO2 through the integral and sustainable use of wood multiple times over the long term has
been part of the debate for some time.

The expansion of domestic production of glued wood-based components and the high level of digitali-
sation in planning and production in the Swiss timber industry mean that demand can be met short-
term. The position of the Swiss timber processing sector can be further strengthened, helping to at
least partially offset Switzerland’s high locational costs. A high degree of flexibility and the ability to
carry out smaller orders at competitive prices will also be one of the Swiss timber processing sector’s
strengths over the coming years.

However, the sword of Damocles hangs over the forestry industry in view of more drier summers,
leading to increasing forced usage of timber and a decline in the quality of the timber harvested. Cli-
mate change may lead to a change in the composition of the timber harvest in terms of wood types
over the medium and long term, which timber-processing companies will have to adjust to.

The performance of the currency – with the Swiss franc expected to strengthen against the euro and
US dollar – also remains a key risk factor in relation to Switzerland’s development prospects. This will
also impact on the forestry and timber industries.

3.3 Excellence in Swiss timber construction

Fagus Suisse – high-quality timber components from Swiss beech

Fagus Suisse will soon be able to look back on a second, successful year of production. This recently
founded company with a broad shareholder base is well connected and its innovative, high-perfor-
mance components made of Swiss beech, oak and ash are increasingly being used in statically com-
plex timber support structures. Architects and timber construction firms appreciate the filigree design
of timber support structures made possible by Fagus Suisse’s timber components. High-strength
bonded wood sheets and large-sized ceiling and wall elements made of hardwood open up new op-
portunities for timber construction in multi-storey residential and commercial developments as well as
public buildings. The high strength properties of the timber components made of beech, oak and ash
mean they can replace steel and concrete as construction materials in many applications. The re-
duced wood volume also produces elegant, slender timber structures which further improves wood’s
competitiveness against concrete and steel. The use of ash and oak in addition to beech has allowed
Fagus Suisse to extend its raw materials basis, expand its product range and increase the design op-
tions available with timber.

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Project for a new wood fibre/insulation panel plant

There is currently no insulation panel production based on timber in Switzerland. In 2019, the last
Swiss manufacturer relocated production of these panels abroad, creating a gap in the Swiss timber
processing chain. This led a major Swiss sawmill to plan the construction of a new plant for wood fi-
bre/insulation panels with integrated production of glued wood-based components and large-format
wall elements for timber construction. The plant is to be built on the site of a paper mill where a
sawmill belonging to this company is already located and will look to take advantage of synergies with
the paper mill in terms of energy supply, waste water treatment and timber supply logistics. The plant
is scheduled to go into operation in 2024.
Swiss timber-frame construction is world-leading and gaining market share

The share of timber construction continues to grow, particularly in the area of multi-storey residential buildings right up to large-scale constructions in wood. Building with wood is back in fashion: the number of planning permission applications for apartment blocks mainly made of wood has more than doubled since 2005. Wood as a building material has received a boost from new fire safety regulations, lower production costs, short construction times with less inconvenience for residents and through the quality that can be achieved through extensive prefabrication with clearly structured work processes in enclosed halls. In high-density building, when adding on to existing buildings, the weight advantages of wood as a building material are naturally a factor. The increasingly visible appearance of wood as a building material is acting as a catalyst in this development.

The Prix Lignum, which is awarded every three years, plays a key role in raising the profile of the importance of domestic and renewable wood as a building material and of the quality of buildings realised in wood. Once again in the 2021 competition, the prize recognises a broad range of very different wooden structures, from a small garden pavilion to large residential complexes and industrial buildings. Even for Switzerland’s internationally-renowned star architects, being involved in modern timber construction is now de rigeur and has become a must. This development is thanks in no small part to the Prix Lignum.

Load-bearing building components are increasingly being replaced successfully with glued beechwood. In this way, building components made from energy-intensive steel and concrete can be replaced by those made from renewable, domestic beechwood, which require significantly less energy to process. Interest in such heavy-duty components made from beechwood is growing, but the corresponding production capacities in Switzerland still need to be developed. Efforts in this area are underway. The cost-effective, industrial fabrication of glued, high-performance construction components made from domestic beechwood is technically demanding, however, and requires significant investment. If these efforts are successful, the share of sales of the most important type of hardwood in Switzerland can be strengthened in sales channels with high added value. At present, a disproportionately large proportion of high-quality beechwood has to be used to generate energy or is exported at low prices to Italy and Asia.

Timber construction is the most successful area of the Swiss forestry-wood chain and is internationally renowned. This is also supported by the research activity at the two Swiss federal institutes of technology in Zurich and Lausanne, the Swiss Federal Laboratories for Material Science and Technology (Empa) and the universities of applied sciences. The digitisation of design and construction of buildings and building components, and the robotic production of complex structures have reached a high standard in Switzerland and are rapidly being developed. This research is carried out in close cooperation with the timber construction sector. However, the success in research and in the timber construction sector does not fully penetrate, and only slowly, through to forestry and the first stage of production – sawmills. Nevertheless, production capacity for glulam timber sections is also being increased in Switzerland due to the high demand. But significant quantities of glulam components will have to be imported from Austria and Germany for a few years yet. They will be produced partly from previously exported Swiss roundwood.
3.3.1 Example 1 New-build refuge centre – a ‘zero-concrete’ project with modular and scalable apartments in Geneva.

Fig. 1 The façade's well-defined structure perfectly showcases oak as a construction material.
(Image source: © PrixLignum – photo by Marcel Kultscher)

Fig. 2 The inner courtyard overlooked by the building fronts featuring galleries provides a recreational space.
(Image source: © PrixLignum – photo by Marcel Kultscher)
Fig. 3 The apartment entrances lead out onto a spacious, inviting gallery.
(© PrixLignum – photo by Marcel Kultscher)

Fig. 4 The low-maintenance, pre-manufactured kitchen modules made of chrome-nickel steel provide a contrast to the wood.
(© PrixLignum – photo by Marcel Kultscher)
Refuge centre for emigrants on the edge of Geneva’s ‘Avenue de France’ – requirements-led, flexibly modifiable apartment sizes and sustainability.

The project can accommodate 370 residents. It aims to set new standards by applying recycling principles at all levels as a sustainable, zero-concrete scheme with low CO2 emissions. Two buildings – each with five storeys – have a symmetrical structure and consist of pre-manufactured modular timber elements. The project enables the various requirements of individual households to be met. In partnership with local actors, the project involves Geneva’s wood sector in the scheme. The project is located in Geneva’s Rigot Park, on the edge of ‘Avenue de France’, next to the Sismondi College buildings. The apartments are accessed from open galleries. A publicly accessible inner courtyard links the Sismondi tram stop with Rigot Park.

The residents expected to occupy the refuge centre do not match the typical profile of a family consisting of a heterosexual couple with two children. The life situations that have driven families into exile are as wide-ranging as the cultures and reasons for emigration. To meet such diverse requirements, the project provides modular and scalable apartments. A modular system enables apartments of two to eight rooms to be provided thanks to a good supply of fire doors. The modularity of the apartments means they could be used for other residential purposes, such as a hotel or student accommodation, over the long-term horizon. Using wooden piles instead of concrete foundations improves a material’s life cycle with low consumption of grey energy, while also minimising waste when demolishing buildings. The completely ‘dry’ design avoids pollution of the surface water during the construction stage. When the project is demolished, there will be no concrete recycling costs.

The canton of Geneva’s oak forest is a major, regional resource for timber construction. In collaboration with the canton of Geneva, the project involved Geneva’s timber industry in the construction process. To minimise delays in the supply of timber, a partnership was set up with Geneva-based forestry companies and sawmills. The amount of timber required for the project is estimated at 3,200 m3. The supply of the wood for the modular structures meets the COBS standards (Swiss certificate of origin for timber). The prefabrication and supply of finished modules was a key factor in planning the construction site. The organisational plan with three parallel construction locations – the foundation, prefabrication of the modules, assembly and finishing – meant the project could be completed within a short space of time. Finding a character that accentuated the timber structure made a rationalised aesthetic the essence of the project. (source: Prix Lignum, edited by EJB)

- Project: Refuge centre for emigrants
- Completion: 2019
- Project location: CH-1202 Geneva, canton of Geneva
- Project submitted for: Prix Lignum 2021
- Award: Prix Lignum 1st place in the west region
- Type of wood mainly used: oak
- Other woods used: fir
- Treatment of wood: untreated
- Client: Hospice Général - service immobilier, Laurence Friederich et Richard McAllister, Genève-Les Acacias
- Architecture/planning: acau architecture sa, Darius Golchan, Antoine Dellenbach et Enric Rovira Ferrer, Genève-Carouge
- Woodwork carried out by: JPF Ducret, Jean-Marc Ducret, Bulle FR
- Engineering services: Charpente Concept, Thomas Büchi, Perly Certoux GE
- Project link: http://prixlignum.ch/p?de/2140
Example 2: New apartment building development with a timber basement in Thun, canton of Bern

Fig. 5 The apartment building with five units arranged in a row.
(Image source: © Prix Lignum – photo by André Maurer Photography)

Fig. 6 The timber-framed basement under construction.
(Image source: © Prix Lignum – photo by Nils Sandmeier, Timbac AG)
Fig. 7 *The timber-framed basement under construction.*
(Image source: © Prix Lignum – photo by Nils Sandmeier, Timbac AG)

Fig. 8 *The roof shape also defines the interior space.*
(Image source: © Prix Lignum – photo by André Maurer Photography)
A highly distinctive apartment building with an innovative timber-framed basement.

A highly innovative apartment building was constructed in Thun. The building with five residential units stands on the first timber-framed basement in Switzerland and does not use any concrete or steel in its construction at all. It is also the ‘living lab’ of the DeepWood research project with the Lucerne University of Applied Sciences and Arts and Bern University of Applied Sciences. DeepWood aims to develop building information modelling (closed BIM) planning methods. Stuberholz constructed the apartment building as the general contractor based on plans produced by Timbatec.

Greenhouse gas emissions are the greatest challenge of our time. Construction generates around 40% of global carbon emissions caused by human activity. Carbon emissions were reduced by not using concrete for constructing the basement and the foundation slab. Wood absorbs around a tonne of CO2 per cubic metre through photosynthesis. The ‘Blüemlimattweg’ project in Thun is the first ever apartment building in Switzerland where wood is used for the basement and foundation slab. Using wood for the basement meant a building could be constructed without any reinforced concrete, thereby achieving maximum CO2 capture.

Cross-laminated timber boards were laid on a 160mm-thick insulation sheet to enable construction of a timber-framed basement. The timber was coated with black insulation to provide damp protection. TS3 joints connect the individual CLT panels together. ‘Timber Structures 3.0 Technology’ (TS3) is a method that can produce large sheets and roof sections from cross-laminated timber. The cross-laminated timber manufacturers treat the front side of the panels at the production plant with a primer and insulating tape. On the construction site the panels are then sealed with a two-component polyurethane cast resin without applied pressure. The same method was used for the foundation slab.

However, it is not just the basement that leads the way in terms of sustainability in the ‘Blüemlimattweg’ project. The building also has its own photovoltaic system and did not require a heating system at all thanks to the effective insulation of the timber-framed basement and controlled ventilation with thermal recovery.

The building is also the ‘living lab’ for a research project on digital planning and BIM (closed BIM). The ‘DeepWood’ research project being carried out in partnership with the Lucerne University of Applied Sciences and Arts and Bern University of Applied Sciences lays the foundation for simultaneous, team-oriented collaboration. The building in Thun was planned using the 3DX platform of ‘Dassault Systèmes’ with CATIA. The initial findings show the benefits of the integrated project space: There are no interface issues to resolve. Establishing the new approach in the construction industry will require well-defined processes, routines and models – from planning and collaboration to automated plan production and machine controls (Prix Lignum, edited by EJB)

- Project: Apartment building with five units and a timber-framed basement floor
- Project location: CH-3600 Thun, canton of Bern
- Completion: 2021
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: spruce
- Other woods used: beech
- Treatment of wood: untreated
- Client: private
- Architecture/planning: Hauenstein La Roche Schedler Architekten AG, Daniel Schedler, Zurich
- Woodwork carried out by: Stuberholz AG, Gabriel Probst, Schüpfen BE
- Engineering services: Timbatec AG, Stefan Zöllig, Bern
- Joinery: Stuberholz AG, Tim Stauffer, Schüpfen BE
- Other general contractors/construction management: Stuberholz, Stephan Rüegg, Schüpfen
- Project link: http://prixlignum.ch/p?de/2219
Example 3: Timber-framed house with a 10-metre-high steel core.

Fig. 9 The front of the building with an open top floor.
(Image source: © Prix Lignum – photo by Maurin Tomascht)

Fig. 10 Installation of the steel stove
(Image source: © Prix Lignum – photo by Maurin Tomascht)
Fig. 11 The steel fireplace on the semi-open top floor.
(Image source: © Prix Lignum – photo by Maurin Tomascht)

Timber-framed detached house with a 10-metre-high steel stove forming the core of the building

A home for a young family – simple design – high quality – eco-friendly – timber – loam – wool – wood shavings – generous outside space – alternative energy – garden – log-burner system – a comfortable home – a simple, healthy home has been constructed. A timber square with a 10-metre-high steel stove that heats the entire house. The stove was positioned in the centre of the house, providing every room with generous heat. The fire is lit in the lounge/dining area. The visible fire and the option of cooking on it give the space a charming ambience.

Access to the upper and roof-top floors is provided via a staircase made of larch with glass elements. The kitchen is situated in the stairwell, ensuring it receives sufficient daylight from the glass windows. The roof-top floor is another highlight of the detached property in the truest sense of the word. High above the rooftops, there is an open 58 m² roof-top terrace with a fireplace, sauna and plunge pool. This provides covered living and recreational space. A raised-bed garden on the carport provides layout options which can be developed gradually over time. This is a wonderful location for a home. (Prix Lignum, edited by EJB)

- Project: Detached property with a wood-fired steel stove forming the core of the building
- Project location: CH-7412 Scharans, canton of Graubünden
- Completion: 2021
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: spruce
- Other woods used: larch
- Treatment of wood: untreated
- Client: private
- Architecture/planning. tomaschett-architektur.ch, Peter Tomaschett, Schnaus GR
- Woodwork carried out by: Cahenzli AG, Stefan Cahenzli, Trin-Mulin GR
- Engineering services: BKS AG, Hanspeter Papst, Chur GR
- Joinery: Cahenzli AG, Stefan Cahenzli, Trin-Mulin GR
- Designer: tomaschett-architektur.ch, Maurin Tomaschett, Zizers GR
- Project link: http://prixlignum.ch/p?de/2118
3.3.4 Example 4: Shipyard building for wooden boat construction in the UNESCO world heritage site of Lavaux.

Fig. 12 Against the backdrop of the vineyards of the Lavaux UNESCO world cultural heritage site, the boatyard building with its gables plays on the tradition of the fishing village of Cully with its fishermen’s huts.
(Image source: © Prix Lignum – photo by Michel Bovin)

Fig. 13 The rear of the building in the evening light with Lake Geneva in the background.
(Image source: © Prix Lignum – photo by Michel Bovin)
Workshop for the restoration and construction of traditional wooden boats in the UNESCO world heritage site.

Renowned for its jazz festival and magnificent landscape with terraced vineyards, the village of Cully is also a port and a fishing village. Evidence of this is provided by the new boatyard opened in spring 2020. The project, supported by the commune, which wanted to preserve a trade related to the lake, was defined in consultation with the Lavaux advisory committee, a guarantor for the quality of the developed environment in this region, which is a UNESCO world cultural heritage site.

The small boatyard is mainly intended for restoring wooden boats. The building is divided into three sections accommodated under one roof: the services and office area located at the rear over two floors, the double-height workshop hall on the lake side and a paintspray unit with separate access at the end of the system.

To incorporate the boatyard into such an extraordinary setting, the façade and roof are divided so as to resemble the traditional fishermen’s huts that line the harbour. On the long façades, the high, triangular windows mark the progression of the gable. They illuminate the workshop without reducing the workspace and give rhythm to the overall structure. On the roof, the repetition of pre-fabricated modules of triangular and interlaced spaces creates the impression of upturned boats side by side. This division is achieved through a fold – in continuity with a geometric and structural reflection – that was started from the office on several structures.

Here the fold is not complete. As on a boat, firstly there is the building frame visible from inside and then the cladding. The primary structure made of glued laminate timber marks the roof edges and links the tops of the gables with the low points of the facing gables. The zigzag design of the rafters between the edges highlights the geometry of the folds and features large lattice structures beneath a pine sheet.
In the outside space, the use of two types of wood is reminiscent of the structure that can be made out in the composition of the façade. Vertical elements made of larch give a rhythm to the fir cladding. The roof edges and external formwork, which are also made of larch, provide better weathering resilience. On the roof, a red waterproofing foil provides an attractive and simple finish whose colour tones reflect the rooftop landscape of the village of Cully.

The attention given to the material and design details as well as the distinctive geometry help integrate this new development into the port of Cully. The timber-framed shipyard ensures the continuation of a traditional industry in one of the most magnificent landscapes on Lake Geneva. (Prix Lignum, edited by EJB)

- Project: New shipyard building for the construction of wooden boats
- Project location: CH 1096 Cully, canton of Vaud
- Completion: 2019
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: fir
- Other woods used: larch
- Treatment of wood: untreated
- Client: Chantier naval de Moratel Sàrl, Yves Estermann, Cully VD
- Architecture/planning: LOCALARCHITECTURE, Manuel Bieler, Lausanne VD
- Woodwork carried out by: Lambelet SA, Marc Lambelet, Puidoux VD
- Engineering services: Ratio-bois SARL, Samuel Baillif, Écublens VD
- Project link: http://prixlignum.ch/p?de/2365
3.3.5 Example 5: Small-scale, timber-framed house in a mountain village in Graubünden – ‘la Casetta’.

Fig. 15 ‘La casetta’, a carefully designed miniature house blends in well with the established village scenery using a traditional façade covered with wooden tiles.

(Image source: © Prix Lignum – photo by Rasmus Norlander)

Fig. 15 The wood tile cladding over the windows and door protrudes slightly to provide protection against the weather.

(Image source: © Prix Lignum – photo by Rasmus Norlander)
Fig. 16 Installation of the prefabricated staircase which forms the building's core.
(Image source: © Prix Lignum – photo by Rasmus Norlander)

Fig. 17 View of the staircase with the storage options and central wall cupboard.
(Image source: © Prix Lignum – photo by Rasmus Norlander)
‘La Casetta’: an ingenious, small-scale house with well-conceived design details

In the centre of the village of Segnas, a barn on a plot of just 31m² has been turned into a detached house under redevelopment rights. Optimal use was made of the limited space. The core element of the new detached property is the cross-laminated-timber tower which connects the mezzanine floors, while also performing various other functions. The size of the plot and building reduced construction costs to enable a detached house to be built for the price of a small apartment.

The village of Segnas is in the Upper Surselva and is listed in the Inventory of Swiss Heritage Sites as a village of national importance. A high level of spatial quality is provided by the dense cluster of buildings in transverse rows along two axes. Within this core zone, the young local developer acquired a small barn on a 31m² plot of land. Thanks to redevelopment rights, the entire site could be built on and developed into a detached property. Heritage-protection provisions also had to be met, requiring a careful approach to the new structure in the protected village centre.

The main challenge was using the limited space as efficiently as possible. The core element of the new detached property is the cross-laminated-timber tower which connects the mezzanine floors, while also performing various other functions. The wooden tower provides partitioning, a staircase, a raised zone, a fireplace and a wood pellet store, and houses build-in cupboards and shelving on all floors. The tower also performs the static function of a support and transfers the load of the ridge beam to the ground. This compact design means the residents can use the rest of the space as they wish.

Large glazed sections bring lots of light into the house and provide sublime alpine views. Due to their positioning, they also provide intimate glimpses of the outside despite the dense building layout in the centre of the village. The redevelopment rights prohibit an increase in the building height, which meant the basement rooms had to be made usable and attractive. A skylight in the ground floor allows daylight to reach the basement floor. Despite total living space of just 55m², the rooms seem generous. The entire length of the building can be seen through the open staircase, making the rooms seem bigger.

The tiles made of local spruce cover the entire building and ensure it blends in well in the village’s historic centre. The visible rafters and simple tin roof are reminiscent of the former barn. The polished concrete shell extends beyond the footprint and the façade and protects the tiles against vehicles and damage. A detached property was built for the price of a small apartment thanks to the small plot and building dimensions. (Prix Lignum, edited by EJB)

Small-scale house called ‘la Casetta’ in a heritage-protected village.

- Project: Small-scale house in the historic centre of a mountain village
- Project location: CH-7186 Segnas, canton of Graubünden
- Completion: 2020
- Developer: private
- Project submitted for: Prix Lignum 2021
- Award: Prix Lignum acknowledgement in the eastern region
- Type of wood mainly used: spruce
- Other woods used: fir
- Treatment of wood: untreated
- Architecture/planning: Atelier Schmidt GmbH, Paul Schmidt, Trun
- Woodwork carried out by: Bearth lenn SA, Adrian Maissen, Rabius
- Engineering services: IPZ Ingenieure + Planer AG, Ursin Venzin, Disentis
- Project link: http://prixlignum.ch/p?de/2133
3.3.6 Example 6: Duplex replacing a previous building in the historic centre of a commune on the outskirts of Zurich

Fig. 18 The two semi-detached homes make optimal use of the plot adapted to the bend in the road.

(Image source: © Prix Lignum – photo by ARC1706)

Fig. 19 There is space for a small garden and a paved driveway on the other side of the building.

(Image source: © Prix Lignum – photo by ARC1706)
Compact, timber-framed design on the outskirts of the city

The two semi-detached homes are located directly on the original village street in Opfikon and – together with the former school building – form the entrance to the village’s historic centre. The style of the buildings made of indigenous woods takes account of the heritage-protected village and provides a solution to the minimal amount of space available through its design and detail. Use of the interior space is maximised. The one-time farming village of Opfikon lies on the edge of the urban development extending through the Glattal and is very close to the motorway and Zurich airport. In this seamless peripheral setting characterised by post-war settlements and contemporary large-scale developments, the village-like buildings and townscape are an exception.

Located on the old village square, the two adjacent houses sharing a party wall make up a significant part of the intact villagescape. The irregular roofline and double gable of the existing building had to be maintained for heritage-protection reasons. These tight spatial restrictions, as well as the proximity to the neighbouring property and the road, had to be taken into account in the design of both timber-framed buildings.

Utilising the basement floor allowed the creation of room sequences which extend over three floors thanks to open-plan rooms and excess heights. Stairs and built-in fittings are positioned in the floorplan in such a way that they create a spatial length in the smallest possible space and that the complexity of the interior is reflected by the geometry of the outer shell. By crossing these intermediate
spaces you are sometimes within and sometimes outside of the integrated area, creating an ambivalent spatial perception.

This multifaceted spatial geometry stands in contrast to a simple design and modest use of materials. A prefabricated timber structure was mounted on a concrete foundation accommodating the topography. The polished ceiling panels and solid beam ceiling meet both structural and finish requirements. To support this duality of materials, the other surfaces are heavily dematerialised. The exterior walls and roof in the interior space are plastered homogeneously to provide a continuous surface and the wood-panelled interior walls are painted opaquely with a slight gloss finish.

The ventilated timber façade translates the division of the building – typical in the local area – into a base of solid and closely butted timber boards and basic boarding on the upper floor. The compact design – combined with the monochrome treatment of the façade using a white chalk paint – produces a monolithic character. The solidity produced allows the small-scale houses to stand out from the existing commercial buildings and to compare favourably with the residential buildings in the village centre. (Prix Lignum, edited by EJB)

- Project: Duplex – replacement building on restricted site in the village centre
- Project location: CH-8152 Opfikon, canton of Zurich
- Completion: 2018
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: spruce
- Other woods used: larch
- Treatment of wood: painted opaquely
- Architecture/planning: ARC1706, Marco Caminada, Zürich / ARC1706, Tibor Rossi, Zürich / ARC1706, Paolo Giannachi, Zürich
- Woodwork carried out by
  - schaerholzbau ag altbüron, Markus Lanz, Altbüron LU
- Engineering services: Synaxis AG Zürich, Robert Sigrist, Zürich
- Joinery: Schreinerei Telle AG, Thomas Telle, Zürich
- Other companies involved: Huber Fenster AG, Bujar Gjergji, Herisau AR/ Christen Rolladen AG, Karl Füglister, Dielsdorf ZH
- Project link: http://prixlignum.ch/p?de/2761
3.3.7 Example 7: From the burnt-out ruins of a 1670 farm to a contemporary agricultural building on the uplands of the Neuchâtel Jura region.

Fig. 21 The original building was turned 90° on its axis and the burnt-out ruins were harmoniously enhanced with wood and concrete.
(Image source: © Prix Lignum – photo by Repel architectes)

Fig. 22: The burned out ruins of the ‘Ferrme la Rotte’.
(Image source: © Prix Lignum – photo by Repel architectes)
**Fig. 23** Polished quarry-stone brickwork, concrete and wood are combined to produce a harmonious overall effect.

*(Image source: © Prix Lignum – photo by Repel architectes)*

**Fig. 24** Wood is the predominant material in the hayloft.

*(Image source: © Prix Lignum – photo by Repel architectes)*
‘Ferme la Rotte’ – a contemporary agricultural building which harmoniously incorporates fire-damaged ruins.

The project involved transforming the ruins of a 1670 farmhouse which was destroyed by fire in 2011 into a contemporary new building. The inversion of the new roof edge when compared with the original façade changes the perception of the site in the landscape, transforming it from an existing traditional style into a contemporary one. The decision to mainly use local timber in structure brings a modern look that contrasts with the remains of the original stonework. Water supply on the pastures is a major issue in the context of sustainable development. The project involves the reconstruction of a farm built in 1670 which was destroyed by fire in 2011, with only a few ruins remaining. One of the major challenges was enhancing it to preserve the historic layers of the stables, while also enabling it to perform its function as a shelter for livestock. The dimensions of the new building depart from the traditional appearance of farmhouses in the surrounding area and inverts the alignment, making the new scale appear less imposing, more contemporary and better integrated into the landscape.

As for the materials used in the new façade, local wood was chosen, enabling a feature on the valley side where an open space for natural ventilation of the stables is created on the north façade. The other façades are closed using shutters. The manure containers were moved to the side to provide good views of the farm from the valley. A skylight – together with the shutters in the façade – creates natural ventilation, provides natural lighting of the mezzanine floor and highlights the timber-framed building’s structure. Taking account of the livestock inside the building, the quarry-stone walls of the burnt-out ruins were covered with a lime render. The ruins were restored in collaboration with the cantonal heritage protection authorities.

The use of contemporary materials and how they have been used as part of a modern style creates a contrast, showcasing the historic part of the old farmhouse. As the new building is located on the water-scarce karstic plateau of the Neuchâtel Jura, the provision of water supply for day-to-day requirements as well as drinking water for the livestock was a major challenge in terms of sustainable development. This is why the project incorporates the storage of rainwater as a key resource with new high-performance water tanks and UV treatment units. (Prix Lignum edited by EJB)

- Project details: Agricultural building incorporating fire-damaged ruins
- Project location: CH-2406 La Chaux-du-Milieu, canton of Neuchâtel
- Completion: 2017
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: spruce/fir
- Treatment of wood: untreated
- Client: Ville de Neuchâtel – Affaires foncières, Nadia Ieronimo, Neuchâtel
- Architecture/planning: Repele architectes FAS SIA, Eric Repele, Neuchâtel
- Woodwork carried out by: ADR SA, Sébastien Magnin, Fontaines NE
- Engineering services: RBA SA, Etienne Grossenbacher, Cernier NE
- Project link: http://prixlignum.ch/p?de/2754
3.3.8 Example 8: The extension to the hotel restaurant has been adapted to the mountain landscape.

Fig. 25 The new build with the existing hotel set amidst magnificent mountain scenery
(Image source: © Prix Lignum – photo by Carolina Piasecki)

Fig. 26 The new building is in harmony with the existing rural development and natural environment.
(Image source: © Prix Lignum – photo by Carolina Piasecki)
Fig. 27 The furnishing of the rooms using local woods creates a charming ambiance.
(Image source: © Prix Lignum – photo by Carolina Piasecki)

Fig. 28 The furnishing concept is continued in the suites.
(Image source: © Prix Lignum – photo by Carolina Piasecki)
Landscape-aware construction on the mountainside using wood as a sustainable material

Construction in a mountainous environment – the ChieneHuus, as part of the overall Kientalerhof complex, is integrated into the landscape of the Kiental, embracing the values of sustainability, innovation and tradition, and meets the special requirements of alpine architecture by taking account of people, the setting and natural surroundings. The new development adopts new approaches towards woodwork through its design as a solid wood building and showcases feasible ways of making sustainable use of regional resources.

A building set amidst a pre-alpine, traditional settlement structure on a scale that meets the requirements of the hotel industry is a significant architectural challenge. The alpine environment requires robust solutions in a context where human activity and nature meet. Adapting to the needs, movements, activities and not least wardrobe requirements of people in the alpine environment means that particular emphasis had to be placed on the style, content, function and shell of the building. Buildings in the mountain regions have always taken account of these factors in their appearance. However, the relationship between the landscape and inhabitants of the mountain regions has changed. While buildings primarily met protective and functional requirements in the past, people today are looking to create a link between living space and their natural surroundings.

The ChieneHuus meets the specifications defined and reconciles the demands of human activity and nature, tradition and modernity and inside and outside space. Using natural construction materials, the building provides an archaic link with the essence and materials of the landscape. The sandblasted concrete foundation firmly embeds the building into its environment using the traditional method for constructing chalets, providing protection and stability against the forces of nature. Clay plaster is used for the rooms on the basement floor. The larch timber façade provides a structure which ensures that the compatible scale of the building blends in harmoniously with the surrounding buildings. A log-cabin-like solid timber (Holz100) design made of pre-fabricated elements makes up the structure on the foundation true to the construction style. The dowelled and glue-free solid wood design creates an extraordinary spatial experience through use of pine surfaces and establishes an unmistakable relationship with the Kiental (Kien presumably comes from the German word ‘Kiefer’ meaning pine). The untreated surfaces of the rooms exude a delightful warmth, are breathable and are radiation-protected thanks to the shielded cable management and the properties of the local softwood felled according to moon phases. This creates an attractive and comfortable retreat. Discreet bay windows and balconies open the interior up to the magnificent mountain scenery.

In tune with the external appearance and the interior ambience, the building exudes an honesty and has a harmonious overall appearance. (Prix Lignum, edited by EJB)

- Project: Extension to an existing hotel restaurant
- Project location, CH-3723 Kiental, canton of Bern
- Completion: 2018
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: spruce/pine
- Other woods used: Scots pine
- Treatment of wood: untreated
- Client: Hotel Kientalerhof, Mario Binetti, Kiental BE
- Architecture/planning: HBR Architekten AG, Thomas Röthlisberger, Thun BE
- Woodwork carried out by: Boss Holzbau AG, Reto von Gunten, Thun BE
- Engineering services: Besmer-Brunner GmbH Holzingenieure und Planer, Roger Schärli, Sattel SZ
- Other companies involved: Holz100 Schweiz AG, Christian Zürcher, Steinen SZ
- Project link: http://prixlignum.ch/p?de/2635
Example 9: A wildlife crossing in Rynetel – a remarkable timber construction promoting biodiversity

Fig. 29 The wildlife crossing in Rynetel passes over the Zurich-Bern motorway in two arches.
(Image source: © Prix Lignum – photo by the Federal Roads Office (FEDRO))

Fig. 30 Timber walls shield the wildlife crossing from the motorway.
(Image source: © Prix Lignum – photo by the Federal Roads Office (FEDRO))
Fig. 31 A wildlife corridor of national importance crosses the structure.

(Image source: © Prix Lignum – photo by the Federal Roads Office (FEDRO)

Fig. 32 The structure consists of curved laminated timber beams.

(Image source: © Prix Lignum – photo by the Federal Roads Office (FEDRO)
Wildlife crossing over a motorway

The AG6 Suret wildlife corridor is of national importance. To enable its unrestricted usage, a wildlife crossing was constructed between Suhr and Gränichen across the A1 motorway. It is the first in Switzerland to be built with timber arched beams. The passage consists of two arched connecting structures of around 17 metres in length and 50 metres in width on walls made of in-situ concrete. Around 850m³ of Swiss spruce were used in the project. The wildlife crossing in Rynetel crosses the A1 between Suhr and Gränichen, completing the national network of wildlife routes in Aargau. It is covered with earth and flora across its total 50-metre width, acting as an ideal interface between human activity and nature to which the wood used also contributes. It is the first wildlife crossing in Switzerland to be constructed with timber arched beams. The double-arch construction is made up of 156 curved laminated timber beams – each 17 metres in length – and a covering of veneered timber sheets. The timber beams are supported by steel joints on concrete walls which are underpinned by foundation piles of 12 to 18 metres in length.

Swiss spruce from Gossau in the canton of St. Gallen and Büron in the canton of Lucerne was used for this pioneering project. Particular emphasis was placed on strength, durability and availability in the selection of the timber. As the wood will be exposed to weathering for many years, the panels were waterproofed, ensuring that, in the event of any damage or cracks, damp and mould cannot penetrate into the components and compromise the structure’s stability. The laminated timber sheets were then glued together using resorcino formaldehyde resin, bent into shape, dried and planed. To prevent the wood from splitting when exposed to strong bending forces, the beams were also bolted in.

Valuable experience in the use of timber for similar structures was gained during the planning and construction phases of the Rynetel crossing. The timber-framed wildlife crossing in Rynetel is the first, but definitely not the last of its kind. This pioneering project attracted strong interest even before its completion. The beams, which are positioned so that they can be clearly seen by motorists, provide the bridge with an aesthetically appealing feature. They both bear the weight and define the external appearance of the crossing.

A green carpet for animals will be rolled out on what is currently the unique timber roof over the motorway. The wildlife crossing allows human and animal transport routes to coexist. However, the timber structure also acts as a link in a figurative sense: the use of wood as a natural, renewable raw material is both sustainable and eco-friendly, symbolising a symbiosis of human life and nature. (Prix Lignum)

Project: Wildlife crossing over a motorway, infrastructure project, public-sector construction

- Project location: CH-5034 Suhr, canton of Aargau
- Completion: 2021
- Project submitted for: Prix Lignum 2021
- Award: Prix Lignum – acknowledgement in the northern region
- Type of wood mainly used: spruce
- Treatment of wood: waterproofed
- Client: Federal Roads Office FEDRO, Richard Kocherhans, Zofingen AG
- Architecture/planning: Ingenieurgemeinschaft WUEF, Bänziger Partner AG und Timbatec AG, Harry Fehlmann, Baden
- Woodwork carried out by: Arge FERA, Aarvia Bau AG und Häring AG, Andreas Angehrn, Würenlingen AG
- Engineering services: Ingenieurgemeinschaft WUEF, Bänziger Partner AG und Timbatec AG, Harry Fehlmann, Baden
- Other parties involved: Federal Roads Office (FEDRO), Andrew Imlach, Zofingen
- Project link: [http://prixlignum.ch/p?de/2114](http://prixlignum.ch/p?de/2114)
3.3.10 Example 10: Interior design, furniture, living space – partition with alcove beds

\[\text{Fig. 33 The bed integrated into the partition wall adopts the old idea of the alcove bed.} \]

(Image source: © Prix Lignum – photo by Fabian Gfeller)

\[\text{Fig. 34 On the opposite side, the alcove bed is at a higher level.} \]

(Image source: © Prix Lignum – photo by Fabian Gfeller)
Fig. 35 The LED lighting in the alcove niche is integrated into the wood surface.

(Image source: © Prix Lignum – photo by Fabian Gfeller)

**A multifunctional partition wall is used to turn one room into two while providing high quality of living and generous storage space.**

Additional requirements, such as cupboards, doors, mirrors, lighting, the alcove bed and much more, are integrated into the compact partition wall. One room is turned into two highly modern, practical rooms. In collaboration with the developer, all design requirements were met by the spatial concept.

The overall design of the partition wall focuses on optimising space and aims to create more space for residents within the existing building structure. Multiplex boards were used to incorporate an authentic structure into the existing one. This meant a modern design could be implemented in existing spaces without changing the room structure.

Using wood-based materials allowed the construction weight to be reduced and the statics to be made self-supporting, allowing rapid conversion of the room. The modularity of the individual elements means they can be individually re-used when dismantled. The integrative room design is of great social importance and enables another young person with an impairment to undertake training and significantly improve their future prospects. The integrative concept symbolises optimised use of space and reduction to the absolute essentials. (Prix Lignum, edited by EJB)

- Project: Interior design, furniture, living area, partition wall with alcove beds
- Project location: CH-3512 Walkringen, canton of Bern
- Completion: 2020
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: birch
- Treatment of wood: varnished
- Architecture/planning Schreinerei Kirchmann, Thomas Kirchmann, Walkringen
- Designer/engineer/implemention/joinery/woodwork: Schreinerei Kirchmann, Thomas Kirchmann, Walkringen
- Project link: [http://prixlignum.ch/p?de/2092](http://prixlignum.ch/p?de/2092)
3.3.11 Example 11: Castagno18 – contemporary furniture made of chestnut

Fig. 36 A minimalist table design showing the surface of chestnut wood which resembles oak.
(Image source: © Prix Lignum – photo by Simone Cavadini)

Fig. 37 The bench matching the table with intergrown knots highlights the appeal of wood as a natural product with individual character.
(Image source: © Prix Lignum – photo by Simone Cavadini)
Fig. 38 The shelving unit also made of chestnut uses traditional timber joints without metal fittings.

(Image source: © Prix Lignum – photo by Simone Cavadini)

Fig. 39 A valet stand made of chestnut provides a highly convenient clothes storage solution.

(Image source: © Prix Lignum – photo by Simone Cavadini)
Chestnut wood is a major part of the traditional rural culture in Ticino.

The Castagno18 project focuses on the history of the chestnut tree, which is the most important in Ticino’s rural tradition. The management of the chestnut forests was a significant part of southern Switzerland’s rural culture. The fruit of the chestnut provided a source of food that was important to survival in the poor canton of Ticino with its barren mountain landscape. The wood was used to construct roof trusses, as posts to tie the vines onto in the vineyards and as a source of energy for cooking and heating. The foliage of the trees was used as bedding in the stables. In the past, people passing what was known as the ‘Arbor’ – a tree amongst trees – took off their hats as a mark of respect. There were two elements to the project: The first is a collection of furniture made of wood, while the second focuses on the transcription of popular recollections for the production of a polyphonic artistic publication.

The project’s entire production cycle – from the harvesting of the tree to the completion of the furniture – is carried out in the Malcantone region of the canton of Ticino in Switzerland. This valuable local chain means that all stages from wood sorting onwards can be monitored closely. Today, this type of wood is primarily used to produce firewood and wood chippings owing to the difficulties in processing it and its particular characteristics, such as knots and splits. This simple design project aims to enhance the value of chestnut wood and to highlight its special qualities to create added value.

A table, bench, cupboard, bookshelf and a valet stand (a practical clothes storage solution) were made for the first collection. Castagno18’s philosophy is based on a contemporary reinterpretation of traditional woodworking methods, such as dovetail joints, where metal fittings are avoided. The use of modern, CNC-controlled, high-precision machinery streamlines the production process, making products of outstanding quality based on the deep-rooted knowledge of traditional woodcraft with chestnut. All pieces in the collection are finished by hand, for example by using beeswax to highlight the material’s special qualities.

In parallel to the design project, a 160-page book about the culture of the chestnut in Ticino was published providing an insight into the significance of this tree to people in the canton of Ticino in the past. Their testimonies are accompanied by two series of photographs showing extraordinary examples of chestnuts and wooden tools used to process the fruit.

The project authors believe that knowledge of our history will provide us with the opportunity to adopt more aware, sustainable and eco-friendly approaches in future. (Prix Lignum, edited by EJB)

- Project: Furniture made of chestnut
- Project location: CH-6938 Vezio, canton of Ticino
- Completion: 2019
- Project submitted for: Prix Lignum 2021
- Type of wood mainly used: chestnut
- Treatment of wood: waxed
- Client: Castagno 18, Lorenzo Bernasconi, Bedano TI
- Architecture/planning: Federico Rella, Federico Rella, Vezio TI
- Woodwork carried out by: Lorenzo Bernasconi SA, Lorenzo Bernasconi, Bedano TI
- Designer: Giulio Parini, Giulio Parini, Sorengo
- Project link: http://prixlignum.ch/p?de/2633
3.3.12 Example 12: REGAL 001 – a sustainable wooden shelving unit construction kit

Fig. 40 The components are fitted together using lathed, threaded wooden joints without the use of metal.

(Image source: © Prix Lignum – photo by Zsigmond Toth)

Fig. 41 The components are fitted together using lathed, threaded wooden joints without the use of metal.

(Image source: © Prix Lignum – photo by Zsigmond Toth)
Fig. 42 The upper ends of the posts are fitted based on the same principle.
(Image source: © Prix Lignum – photo by Zsigmond Toth)

A wooden shelf construction kit for toolless self-assembly without metal fittings.

Thanks to its patented ‘Klick-Verbindung’ (click connection), the REGAL 001 consists purely of untreated ash from local forests, avoiding unnecessary transport and supply chains. The classic design using shelves and posts means the products can be assembled easily and quickly without the need for additional tools. The modular system allows shelves to be added in line with requirements and one shelf unit to be turned into two in an instant. The project aims to meet the requirements of life where actions and practices adopt a contemporary approach to foster sustainability and durability.

As longevity is combined with functionality and aesthetic appeal, it is helpful that we live in the current age where information and inspiration can be shared and ideas and expertise exchanged remotely, so that the technical options can be used to ultimately create intelligent, fairly made and resource-saving products – ones that will provide pleasure and enrich lives.

If an everyday item is sustainable and durable in every respect, then it has clearly been made without compromise in terms of design and quality. What makes the difference in this case is the production of
low-tech using high-tech: state-of-the-art milling technology enables the shelves to be joined without the need for any adhesives and the wooden screw joints provide a reversible and wear-free upward connection method. The outcome is a modular shelving system without the use of adhesives or metal. It can be assembled and dismantled quickly and can be adapted and added to in line with requirements at any time. The aim is to promote a contemporary construction and furniture industry to meet global sustainability goals. The construction and furniture industry has always known how to use modern tools and innovation, but now it is no longer a question of more is more, but instead of less but better!

- Project details: Furniture
- Project location: CH-6422 Steinen, canton of Schwyz
- Completion: 2021
- Project submitted for: Prix Lignum 2021
- Award: Prix Lignum acknowledgement in the central region in 2021 – special joinery prize
- Type of wood mainly used: ash
- Treatment of wood: untreated
- Client: STUDIO NOUN × LINDAUER AG, Roger Lindauer, Steinen SZ
- Architecture/planning: Studio Noun, Hendrik Steinigeweg, Zürich und Studio Noun, Philipp Schaeufle, Zurich
- Joinery: SZLindauer AG, Roger Lindauer, Steinen SZ
- Project link: http://prixlignum.ch/p?de/2482
4 Roundwood: sawlogs, pulpwood and fuelwood

4.1 Developments up to mid-2022

The unusually cool, wet weather conditions in spring/summer 2021 significantly alleviated the summer drought stress for forests that year. There was no major storm damage in Switzerland during the period from 2021 to mid-2022, in contrast to other European countries. The amount of forced use of timber halved from around 1 million m³ in 2020 to around 0.5 million m³ in 2021. The fall in the number of bark beetles caught per felling followed a similar pattern. The situation in terms of the amount of bark beetle wood also continued to ease in 2022. However, this positive trend turned negative again due to the long-lasting drought and heat in the summer of 2022.

The higher prices due to strong demand provided forest owners with an incentive to harvest more timber. Despite the decline in the amount of forced wood usage, 4% more wood was harvested overall in 2021 than in the previous year at just under 5 million m³. This is the second successive time that the timber harvest has risen. The last time the same amount of wood was harvested was in 2018 and 2012. This is a positive signal from the forestry industry in terms of Switzerland’s wood supply. Of the 5 million m³, sawlogs accounted for 2.5 million m³, or half of the amount – a 6% increase.

Energy wood reaffirmed its important status as an indigenous, regenerative and carbon-neutral source of energy in 2021 with a 2% increase in the amount harvested to 2 million m³, or 40% of the total wood harvest. This saw demand for logs climb again. Forestry statistics indicate that more energy wood has been provided as wood chippings than in the form of sawlogs since 2014. Wood chippings accounted for 63% of total energy wood in 2021. When energy wood was divided into these two categories for the first time in 2004, the figure stood at just 24%. In contrast, the share of sawlogs has fallen constantly from 76% to 37% today. This makes it all the more remarkable that the total amount of sawlogs harvested has risen by 5% from 2020 to 2021, while that of wood chippings has only increased by 0.5%. With growing uncertainty over energy supply, this points to greater demand for wood fired, such as open fireplaces and small log burners (like Scandinavian wood stoves). The shortage of and rise in the cost of oil and gas due to the war in Ukraine will see this trend intensify in 2022–23.

The volume of industrial wood harvested and sold stood at 0.5 million m³ in 2021, which means its share is practically unchanged at around 10%.

With regard to the wood type groups harvested in the Swiss forests, the share of softwoods at 69% is over twice as high as hardwoods at 31%. Almost two-thirds of the wood harvested comes from forests under public ownership, and one third from private forest owners. This ratio has barely changed since the 2020 survey. In contrast, 71% of Switzerland’s forest area is under public ownership and 29% on private land.

The increased timber harvest and higher wood prices saw forestry companies cut their deficits as indicated by the forestry statistics produced by the Federal Statistical Office (FSO) and the forestry test operational network of the Federal Office for the Environment (FOEN).


Fig. 32 – Wood harvest in Switzerland 1992 – 2020 in m³
4.2 Timber assortments and price trends

Of the total amount of 5 million m$^3$ of wood harvested in 2021, 3.45 million m$^3$ or 69% was softwood and 1.455 million m$^3$ or 31% hardwood. 49% of the total amount was sawnwood, of which 2.22 million m$^3$ or 44.5% was softwood and 4.5% hardwood. 0.55 million m$^3$ or 11% of industrial wood was felled in 2021, of which 7.5% was softwood and 3.5% hardwood. Industrial wood, to which higher quality requirements apply than energy wood, is sorted as a by-product of sawnwood in Switzerland and is specifically harvested in young forests.

The remainder of 1.98 million m$^3$ or 39.6% of the wood harvested in 2021 is energy wood. Of this total, 0.83 million m$^3$ or 16.7% is energy softwood, of which 4.4% is made up of logs for manually fed small fires and 12.3% wood chippings for automatically fed medium-sized and large wood-fired systems. Of the 1.15 million or 22.9% of energy hardwood, 10.4% is logs and 12.5% wood chippings.

The Swiss sawmills and industrial wood processors were generally well supplied with raw timber during the period under review, despite a decline in the amount of forced wood usage compared with 2020.


4.3 Economic situation of the forestry sector

Public forestry operations manage 71% of Switzerland’s productive forest area. Despite considerable cost-reduction efforts, the operating results of the Swiss forestry sector improved in 2017. The corresponding data were collected via a test network of 160 forest enterprises distributed across Switzerland in the forest regions of the Jura, the Central Plateau, the Prealps and the Alps.

Higher timber prices reduced the deficit of forestry companies in 2021: The 656 public Swiss forestry companies generated total revenue of CHF 583 million in 2021. Expenditure stood at CHF 590 million, resulting in a deficit of around CHF 7 million. In 2020, the deficit was CHF 44 million. This development is explained by the higher timber prices – the strong demand has seen prices rise so much that they are considered to be at “a normal level” by timber market experts.

Losses in test operations were halved: Among the companies that are part of Switzerland’s forestry test operational network, comprising 160 selected forestry companies which carry out full-cost accounting, losses were halved in 2021 compared with the previous year. The losses in the forestry industry in 2021 came in at CHF 33/ha compared with CHF 66/ha in the previous year.

In terms of the wood supplied, there was a loss of CHF 8/m3. The figure for 2020 was twice as high at CHF 16/m3. Losses in terms of total operations (forest management, material goods and services) were cut from CHF 59/ha to CHF 29/ha. The losses were halved due to a CHF 8/m3 increase in average timber revenues which rose to CHF 69/m3. Sawn softwood prices rose by CHF 13/m3 from CHF 72/m3 to CHF 85/m3.


4.4 Wood energy

The overall Swiss energy statistics indicated that Switzerland’s energy consumption rose by 6.3% in 2021 compared to the previous year, from 747,900TJ (Terajoule) to 794,720TJ. The main reasons for this were the cooler weather conditions compared with the previous year and the relaxation of restrictions imposed to combat the COVID-19 pandemic. The number of heating degree days – a key indicator of energy consumption for heating purposes – soared by 15.3%. Factors that determine the long-term growth trend for energy consumption also went up slightly: The permanent resident population increased by 0.8%, gross domestic product by 3.7%, the number of motor vehicles by 1.1% and the housing stock increased, but no detailed figures are currently available. However, efficiency improvements and substitution effects are having a restraining effect on growth in energy consumption.

End consumption of petroleum-based fuels soared by 10.5% between 2020 and 2021 from 101,110TJ to 111,710TJ. With regard to fuels, end consumption of petrol climbed by 2.2% from 86,090TJ in 2020 to 87,970TJ in 2021. The figure for diesel oil rose by 1.1% from 10,999TJ in 2020 to 11,240TJ in 2021, while that for aviation fuel went up by 11% from 30,630TJ in 2020 to 34,000TJ in 2021. Combined end consumption of fossil-based, imported combustibles and fuel saw a 5.2% increase on a crude oil basis from 327,830TJ in 2020 to 344,920TJ in 2021. The share of total energy consumption in 2021 stood at 43.4%. This proportion is still alarmingly high in view of the current geopolitical situation and the impact of CO2 emissions on global warming.

There was a 4.3% rise in the end consumption of electrical energy from 55,714GWh or 200,570TJ in 2020 to 58,113GWh or 209,210TJ in 2021. In 2021, end consumption of electrical energy accounted for 26.3% of total end energy consumption. Production of electricity from photovoltaic systems went up by 9.3% from 2,599GWh in 2020 to 2,842GWh in 2021, accounting for a 8.4% share of domestic net power production. This means the potential for generating electricity from photovoltaic systems in Switzerland is only being harnessed to a very small extent.

End energy consumption of gas increased by 8.3% from 112,900TJ in 2020 to 122,280TJ in 2021. As in most European countries, a large proportion of this natural gas comes from Russia which is a major issue in view of the Russian attack on Ukraine and the consequent sanctions imposed on Russia as the aggressor. An additional 1330TJ of biogas was fed into the natural gas grid and recorded under gas in 2020 and 2021. In wood energy, end consumption soared by 16.4% from 39,860TJ in 2020 to 46,390TJ in 2021, accounting for a 5.8% share of total end energy consumption in 2021.
According to the Swiss wood energy statistics for 2021, 8.188 million MWh of end energy was generated from wood in Switzerland in 1990 on a seasonally adjusted basis, while the figure stood at 9.184 million MWh in 2000, 12.371 million MWh in 2010, 15.414 million MWh in 2020 and 16.151 million MWh in 2021. That represents an 83.2% increase from 1990 to 2021, which means the figure has almost doubled.

Of the 25 categories and sub-categories of wood-burning systems recorded in the wood energy statistics, two are of particular interest in this report. In 1990, no energy was generated with wood-fuelled combined heat and power plants. The figure stood at 0.052 million MWh in 2000, 0.077 million MWh in 2010, 1.708 million MWh in 2020 and 1.854 million MWh in 2021. In view of the power shortage forecast for the coming winter, the seasonal use of these systems is even more financially attractive.

In automated wood-fuelled systems at wood processing companies, 0.257 million MWh of end energy adjusted for weather conditions was generated in systems with an output of 50 to 300KW in 1990. The figure was 0.360 million MWh in 2000, 0.410 million MWh in 2010, 0.444 million MWh in 2020 and 0.445 million MWh in 2021. This represents a 73.2% increase over this period. For systems with an output between 300 and 500KW, the figure was 0.118 million MWh in 1990, 0.173 million MWh in 2000, 0.180 million MWh in 2010 and 0.190 million MWh for 2020 and 2021. This represents a 61% increase over this period. For systems with an output of over 500KW, the figure was 0.398 million MWh in 1990, 0.708 million MWh in 2000, 0.801 million MWh in 2010, 0.788 million MWh in 2020 and 0.797 million MWh in 2021 which is a 100.2% increase or a doubling over the period concerned. The different rate of increase also reflects the development of the wood industry, especially sawmills, where there is a trend towards larger companies. (Source: SFOE)

A wood-heating power plant was built in Frauenfeld in 2022 at a cost of CHF 45 million, in which wood gas is generated from sawmill residue, windthrow and wood chippings using the thermochemical process of pyrolysis at a temperature of 850°C. Using the wood gas, four large-scale combustion engines fitted with generators produce electricity for 8,000 households. Some of the waste heat is used by the neighbouring sugar factory and some by the district heating network in the town of Frauenfeld. This plant is set to undergo a CHF 40 million upgrade shortly. The charcoal produced in the process is to be used in agriculture for soil improvement, as an animal feed supplement and as activated carbon in the treatment of drinking water. This wood-fired power plant with a fuel utilisation rate of up to 92% will come into operation in summer 2022.

In the commune of Buttisholz in the canton of Lucerne, which has around 3,500 residents, there are plans to construct a cogeneration plant based on wood pyrolysis gas which will generate peak demand power and heat during winter. The excess heat will be fed into large-scale heat storage systems operated communally where it can be accessed outside of the cogeneration plant’s operating hours.

The industrial plant Basel IWB currently operates two wood-fuelled power plants, which fed 150.3GWh of heat and 20.9GWh of power and 65.5GWh of heat and 25.3GWh of power into the city’s energy grid in 2021. The larger of the two plants, ‘Holzkraftwerk I’, is 51% owned by Raurica Wald AG and 49% owned by IWB. The second plant, ‘Holzkraftwerk II’, is wholly owned by IWB. There are now plans to partially convert IWB’s ‘Heizwerk Bahnhof’ plant in Basel city centre from purely natural gas operation to operation with carbon-neutral wood pellets. The new furnace is to be installed in 2023. It will then go into operation in winter 2023–24. A new hall will be added for the delivery of wood pellets to avoid dust emissions.

4.5 Certified forest and forest products

4.5.1 FSC and PEFC certification

Approximately 0.65 million ha of Swiss forest (i.e. 51 % of the total forest area) was certified in 2014. Of these certified areas, more than the half have both FSC and PEFC certification. Of the timber
harvested in Switzerland in 2014, 66% was certified. The corresponding data were not surveyed from 2015 since the revision of the Swiss forestry statistics.

At present, over 900 companies operating at all levels in the timber processing sector hold a certificate. In contrast to the situation in the forestry sector, the majority of these companies, only hold the FSC certificate. Thus, the Swiss wholesale distributors, which also hold a significant share of the market in the DIY sector, are FSC-certified. 30% hold both the FSC and PEFC certificate. At present there are no companies in Switzerland that are solely PEFC-certified.

In 2009 a national certification standard, which forms the basis of certification for FSC and PEFC in Switzerland, was introduced by both label organisations. However, this harmonisation is criticised today as the competition between the private labels is disappearing as a result of its introduction.

The main driving forces for certification in Switzerland are the DIY sector and the demand for certified paper products. However, the sellers of certified wood cannot demand a higher price ("green premium"). Thus, the market does not compensate for the additional costs incurred in certification. For this reason, certification is a contentious issue in the forestry and timber sector.

4.5.2 “Herkunftszeichen Schweizer Holz” (label of origin)

The origin of the wood is not declared under the FSC and PEFC certification systems. In 2009 the forestry and timber industry introduced a new label (“Herkunftszeichen Schweizer Holz”, HSH). It is managed by LIGNUM, the Swiss timber sector umbrella organization. Its main purpose is to show and prove the Swiss origin of the timber products.

The intention here is to raise the awareness of end users about Swiss wood that is produced in accordance with the strict sustainability requirements of the Swiss forest legislation and has not caused environmental pollution as a result of being transported over long distances. The HSH guarantees the traceability and documentation of a wood product from its origin to the end user. Products bearing the Herkunftszeichen Schweizer Holz label of origin may contain up to 20% of wood of foreign origin if it comes from a comparable production region (low risk origin) and has a sustainability certificate or declaration of origin.

Since September 2011, all wood originating from Swiss forest areas can be marked with the Herkunftszeichen Schweizer Holz label of origin. Use rights are assigned to forest owners if they are prepared to fulfil the conditions of the regulation. The cantonal forestry sector associations monitor compliance with the regulation requirements.

4.6 Sawnwood

The construction industry, particularly timber-framed construction, remains the most important sales market for sawnwood. The fire protection standards for timber structures, revised in 2015, have led to a marked increase in the construction of multi-storey residential and office buildings, with towers of up to 80 metres high. The timber construction sector is continuing on the path to success and gaining market shares. In 2020, the share of wood used in support structures for residential buildings above three units stood at 8.6%, for hospitals, other buildings in the healthcare sector and care homes at 14.1%, for commercial and administration buildings at 14.9%, for industrial buildings at 16.4%, for sport and leisure facility buildings at 22.5%, for residential buildings of up to two units at 19.6%, for teaching and education buildings at 23.4% and for agricultural buildings at 36.7% (the highest of all). The share stood at 15.6% across all building categories in 2020. This means there is still great potential for significantly increasing the share of wood used in construction and making even better use of wood’s potential for CO₂ avoidance as a regenerative, indigenous construction material.

The dynamic growth in timber construction keeps gathering pace and is increasingly influencing the mood of the suppliers, the sawmill sector. They are again optimistic about their future prospects, which is reflected in increased willingness to invest, e.g. in production facilities for glulam structural timber and photovoltaic installations for in-house power generation. But a high percentage of glulam structural timber in particular is still imported from the neighbouring countries of Austria and Germany. The
Swiss sawmill industry is recovering thanks to investment in glued laminated timber production and will also benefit from proximity to customers in this area.

In 2021, the 327 sawmills in Switzerland processed 2,061 million m$^3$ of sawnwood into 1,248 million m$^3$ of sawn timber, which equates to efficiency of 60.5%. 39% of this amount is cut by five large sawmills with cutting capacity of over a 100,000m$^3$ of roundwood per year. 95.8% or 1.196 million m$^3$ of the sawn timber generated is sawn softwood, 97.3% is spruce/pine and 2.7% is other types of softwoods. Of the hardwood share of the sawnwood, which amounts to 4.2% or 52,400m$^3$, the greatest proportion is accounted for by beech at 44.4%, while 55.6% is other types of hardwood, such as oak, ash and maple.

In 2021, Swiss sawmills generated 813,100m$^3$ of sawmill residue, of which 95.8% was softwood residue and just 4.2% hardwood residue. 18% of the wood residue is used to generate energy by the sawmills themselves, 40% is used to produce energy by third parties, 35% goes to the paper, cardboard and wooden composite board industry as raw material and 7% is used for other purposes, such as bedding for horses.

Swiss sawmills largely cover their sawlog requirements from domestic sources – at prices charged in Swiss francs. They also export sawnwood and sawnwood residues into the euro zone. As a result, they face a double, and correspondingly severe, competitive disadvantage vis-à-vis their competitors from the EU. Moreover, the Italian sawnwood market, a traditional sales channel, is declining, and, on the domestic market, traditional wood boards cut to the customer’s specifications for construction purposes, are being increasingly replaced by further processed semi-finished products such as glued construction timber. The prices of imported glued-laminated beams correspond approximately to those that Swiss laminated wood producers have to pay for domestic sawnwood. Given that the increase in the average prices of the sawnwood assortments was lower than those of sawn roundwood, the economic scope available to the sawmills decreased further.

The sawnwood price index fell from 102.6 index points in the survey period January to February 2020 to a low of 99.8 index points in the survey period July to August 2020 before rising sharply to 110.6 index points in the survey period May to June 2021, thanks to the strong increase in demand.
Wood-based panels can also be used to a much greater extent in multi-storey, timber-framed buildings, thanks to the new fire protection regulations. Production of these products has nevertheless largely been relocated abroad due to high location costs in Switzerland. As only chipboards and OCR boards were still produced in Switzerland in 2020 and the only manufacturer of fibreboards ceased production in Switzerland in 2019, the production volume has to be estimated for data protection reasons. It stood at around 400,000m³ of chipboards, including OCR boards, and around 200,000m³ of MDF/HDF boards in 2021. Plywood production – for skis, seating on trains and other high-quality products – is marginal at 7,000m³.

Pulp and paper
Chemically processed pulp has not been made in Switzerland since 2008. The Swiss paper industry has been struggling for years, as a result of digitalisation and margin and price pressure from cheaper production locations. Sales figures have been falling for some time, particularly for high-quality and graphic paper and newsprint paper. The change in the national framework conditions and the concentration process taking place globally has seen production volumes relocated from Switzerland to other company locations over recent years. Only one plant in Switzerland now makes paper for newsprint.

Like many other sectors, the paper industry was also faced with supply bottlenecks in 2021. This concerned both waste paper and pulp. There was a shortage of waste paper throughout Europe during the period under review. Paper plants urgently required old stock to make new paper. The volume of newspapers and advertising material continued to fall during the pandemic, while demand for packaging materials rose. The battle between various paper manufacturers to obtain raw materials is driving prices up throughout Europe. To make around 1 million tonnes of paper in Switzerland a year, just as many tonnes of fibres are required. 95% of this is obtained from the recycling of waste paper. The recycling of waste paper and cardboard makes a major contribution towards the sustainable use of wood, a regenerative raw material. Waste paper cost two to three times more at the end of 2021 than at the start of the year. The supply situation has been further exacerbated by the Russian attack on Ukraine. Paper manufacturing is an energy-intensive process and the significant rise in energy prices is currently driving up production costs.

At 1.024 million tonnes of paper and cardboard, the Swiss paper and cardboard industry supplied 5.9% more in 2021 than in the previous year. Of this total amount, 339,000 tonnes were paper for newsprint and 165,000 tonnes other graphic paper, which represents a significant increase year-on-year of 17.4% and 10.5% respectively. The supply of paper and cardboard has fallen by almost a quarter since 2017, while that of newsprint paper has slumped by over a third.
In 2021, exports of paper and cardboard fell by 6% overall and by 16.4% for newsprint paper. In 2021, imports were down slightly on 2020, falling by 1.6%, while the figure for newsprint paper soared by 19.9%, clearly underlining the economic recovery after the relaxation of measures taken to contain the COVID-19 pandemic, which caused a downturn.

Total Swiss consumption of paper and cardboard in 2021 was at least 0.4% lower than in the previous year at 937,600 tonnes. This decline is due to a 4.4% fall in the consumption of newsprint paper and a 7.8% decrease in toilet and kitchen roll.

In 2022 the paper and cardboard industry is still suffering the effects of the COVID-19 pandemic and is now also faced with the economic and geopolitical upheaval of the Russian attack on Ukraine.

Further information: https://spkf.ch

Fig. 37– Production of wood panels, fibreboards, mechanical pulp and wood pulp 2002-2021

5 Tables

5.1 Economic Indicators for Switzerland

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¹ State Secretariat for Economic Affairs SECO, revised 2012 in accordance with NOGA 2008 (Nomenclature Générale des Activités économiques); statistical series retrospectively revised
² Consumer Price Index, Swiss Federal Statistic Office BFS
³ State Secretariat for Economic Affairs SECO
⁴ Swiss National Bank SNB
⁵ Swiss National Bank SNB
5.2 Forest products production and trade 2017-2018; Estimations and Forecasts 2019–2020

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Please return (preferably by e-mail) to Timber Section no later than 15 October 2021.

By e-mail to stats.timber@un.org.
Questions? Please contact Alex McCusker at the above address or telephone +41 22 917 2880.

The historical data are from the most recent Joint Forest Sector Questionnaire (blank) or the Timber Forecast Questionnaire (#). For explanations please see cover letter.
These data are flagged with E, R, N or C for secretariat estimate, repeat, national estimate or calculated totals (from subitems). If there is no flag, this indicates officially supplied data.
### Historical data

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### Forecast

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### Can also be downloaded in Excel format at: [Link](#)