



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

---

## SMEs and digitalisation

### Regional case study on the wood value chain in canton Valais (Switzerland)

---

December 2020

Swiss Center for Mountain Regions (SAB)



Schweizerische Arbeitsgemeinschaft für die Berggebiete  
Groupement suisse pour les régions de montagne  
Gruppo svizzero per le regioni di montagna  
Gruppa svizra per las regiuns da muntogna



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

This report was produced as part of the Smart SMEs project and was funded by the Alpine Region Preparatory Action Fund (ARPAF II). It was prepared by Thomas Kadelbach in cooperation with Peter Niederer from the Swiss Center for Mountain Regions (SAB) in Berne, Switzerland.



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

### Table of contents

<b>Introduction</b>	3
<b>Basic statistical data on the Canton of Valais</b>	5
Population	5
Economy and employment	5
Small and medium-sized enterprises	5
<b>Value chain wood</b>	7
Forest area and structure	7
Forestry and timber industry	7
Schematic representation of the wood value chain	10
Challenges and potentials	10
<b>Digitisation environment and innovation promotion</b>	13
Cantonal level	13
Supracantonal level	13
Federal level	14
Educational and research institutions	14
Private research expenditure	15
Digital infrastructure	15
<b>Degree of digitisation of the companies</b>	16
General remarks	16
Digitalisation as part of the corporate strategy	17
Assessment of potentials and risks	18
Areas of application of digital technologies	19
Investment in digitisation projects and cost-benefit ratio	24
Staff qualification and training measures	25
Public support and innovation networks	26
Practical challenges	27
<b>Conclusions</b>	30
<b>Source list</b>	32
<b>Annex</b>	33



### Introduction

Digitalisation is one of the core themes of the macro-regional strategy for the Alpine Space (EUSALP). EUSALP Action Group 5, led by the Val d'Aosta Region and the Swiss Center for Mountain Regions (SAB), explicitly addresses the opportunities of digitalisation for the Alpine Space. On the initiative of the SAB, Action Group 5 joined forces with Action Groups 2 and 3 to analyse the opportunities of digitalisation for SMEs. Under the leadership of the SAB, partner organisations from Germany, Italy, Austria and Slovenia, as representatives of the three aforementioned action groups, launched the "Smart SMEs" project, which runs from 2019 till 2021.

The project aims to analyse the opportunities and challenges arising from digitalisation for small and medium-sized enterprises (SMEs). In particular, the degree of digitalisation of SMEs will be assessed and the most important obstacles will be presented. A particular focus is on SMEs that are part of natural fibre-based value chains, i.e. that produce or process biological resources. In this way, the project aims to contribute to the strengthening of bio-based value chains in the Alpine Space and to promote the sustainable transformation of the economic fundamentals. The Smart SMEs project is mainly funded by the European Parliament's Alpine Region Preparatory Action Fund.

The report presents the results of a regional case study on the potential of digitalisation for the wood value chain in the Swiss canton of Valais. Analogous to the main questions of the "Smart SMEs" project, it includes the following three thematic focal points:

- Wood value chain in the canton of Valais
- Digitisation environment and innovation promotion
- Degree of digitisation of the companies

The synthetic data on the wood value chain in Valais as well as on the digitisation environment and the promotion of innovation are mainly based on literature and internet research and statistical information. To assess the degree of digitisation of the companies, 13 in-depth interviews were conducted (length 1.5 hours at least) with company managers and representatives of associations between June and September 2020. The semi-structured interviews were based on the standard questionnaire of the "Smart SMEs" project (elaborated by project partner BioPro) and focused on regional cooperation in the wood value chain, the company and digitisation strategy, areas of application of digital solutions, the cost-benefit ratio, and opportunities and challenges in connection with the new technologies.

The interviews cover the various production and processing stages of the wood value chain in the canton of Valais. The following companies were interviewed:

- 2 Forestry operations
- 3 Sawmills
- 4 Carpentries and joineries
- 2 architectural offices specialising in timber construction

In addition, discussions were held with the Association of Valais Forests and the Association of Carpenters and Master Carpenters of Upper Valais.



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

The enterprises surveyed are predominantly small enterprises with 20 to 30 employees. 2 companies have 10 or fewer employees, 1 company has more than 100 employees. The businesses are located in both language regions of the Canton of Valais and in both the main valley and the side valleys.

Due to the limited number of interviews, a statistical analysis of the answers was not carried out. The evaluation of the interviews provides a qualitative perspective of the assessments of the company managers on the topics addressed. The report's conclusions summarise the most important results.



## Basic statistical data on the canton of Valais

### Population

The canton of Valais is located in the southwest of Switzerland in the Alpine region and covers an area of 5 224.6 km<sup>2</sup>. The Rhone Valley between Lake Geneva in the west and the Rhone Glacier in the east, as well as the side valleys to the north and south of this main axis, shape the topographical structure of the canton. In 2018, the permanent resident population of Valais was 341 463. Around two thirds of the population are French-speaking, one quarter German-speaking.

### Economy and employment

According to the Federal Statistical Office (FSO), the GDP of the canton of Valais was CHF 18,41 billion in 2017, or CHF 54'083 per inhabitant. This value is significantly below the Swiss average (79'218 francs per inhabitant).<sup>1</sup> The share of the primary sector in the cantonal GDP is around 2 per cent and that of the secondary sector around 28 per cent. The tertiary sector contributes 70 per cent to the cantonal value added.<sup>2</sup>

In 2018, the economy of the Canton of Valais employed 180 185 people. Of these, 10'218 were employed in the primary sector (5,7 per cent), 38'189 in the secondary sector (21,2 per cent) and 131'778 (73,1 per cent) in the tertiary sector. The primary sector has a larger share of employment in the canton of Valais than the national average (3,1 per cent).<sup>3</sup>

### Small and medium-sized enterprises

The analysis of employment by company size class highlights the central importance of small and medium-sized enterprises (SMEs) for the Valais economy. Micro-enterprises with fewer than 10 employees accounted for 37,8 percent of employment in 2017. Small businesses with up to 49 employees accounted for 29,2 per cent of employment, while medium-sized businesses with up to 249 employees accounted for 19,0 per cent. Large enterprises with 250 employees or more accounted for 13,8 per cent of employment:<sup>4</sup>

<sup>1</sup> National accounts. Federal Statistical Office.

<sup>2</sup> The Valais in figures 2019. Cantonal Office for Statistics and Fiscal Equalisation.

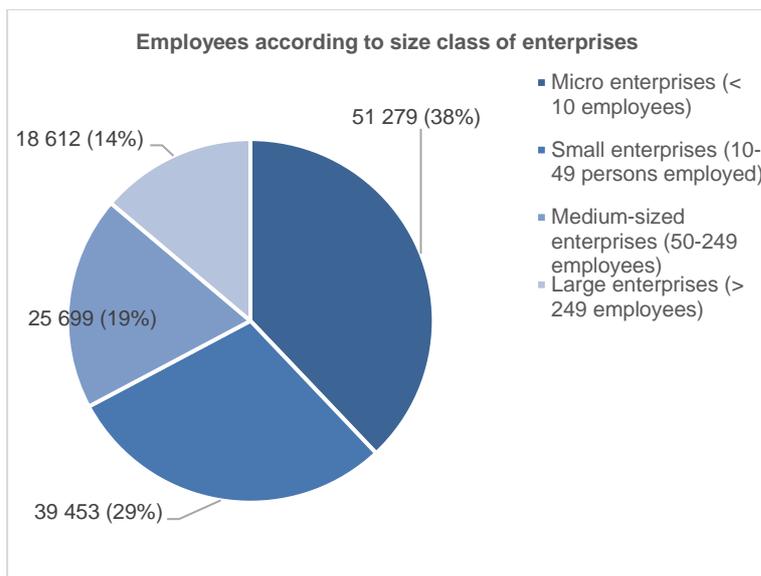
<sup>3</sup> Statistics on the structure of enterprises. Federal Statistical Office.

<sup>4</sup> Statistics on the structure of enterprises. Federal Statistical Office.



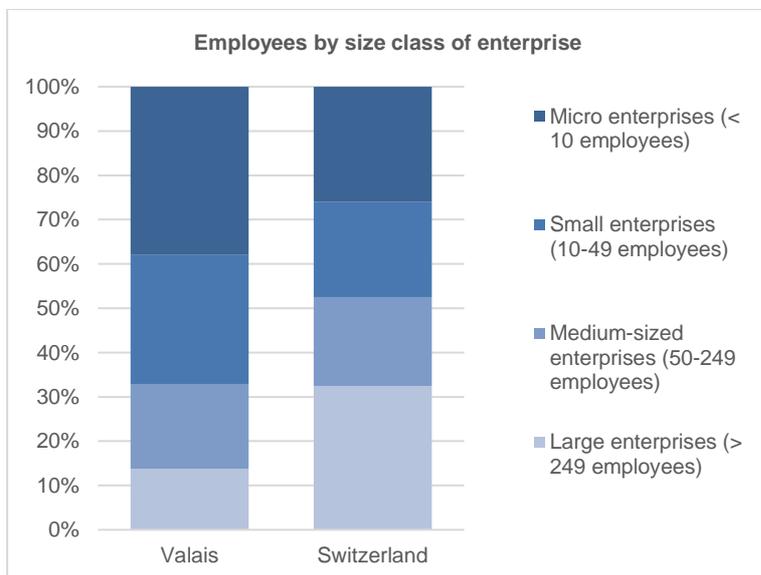
## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)



Source: Federal Statistical Office, statistics on business structure. Illustration SAB.

The comparative data for Switzerland show that micro and small enterprises are of above-average importance in the Canton of Valais. In 2017, 26,0 percent of Swiss employees worked in micro-enterprises, 21,5 percent in small enterprises and 20,0 percent in medium-sized enterprises. As the chart below shows, large companies accounted for 32,4 per cent of employment in Switzerland: <sup>5</sup>



Source: Federal Statistical Office, statistics on business structure. Illustration SAB.

In the primary sector of the canton of Valais, the small structures are even more pronounced than in the secondary and tertiary sectors. According to data from the FSO, 78,1 per cent of all employees in the Valais primary sector worked in companies with fewer than 10 employees

<sup>5</sup> Statistics on the structure of enterprises. Federal Statistical Office.



## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)

and 18,2 per cent in those with 10 to 49 employees in 2017. Medium-sized companies accounted for 3,7 per cent of employment. There are no large companies with more than 250 employees in the primary sector of the Canton of Valais.<sup>6</sup>

## Wood value chain

### Forest area and structure

The forest area of the Canton of Valais amounted to around 110,000 hectares in 2019. This accounts for almost a quarter of the canton's total area. More than 90 per cent of the forest is in public ownership and belongs to "Burgergemeinden" or forest cooperatives. At around 9 percent, the share of private forest is marginal.<sup>7</sup>

Depending on the climate and altitude, different forest structures and tree species dominate. On the plain and on the slopes of the Rhone Valley, beech, oak and pine forests predominate. On the subalpine level, mountain spruce forests predominate. Larch and stone pine forests form the upper tree line. Almost 80 percent of the Valais forest consists of conifers.<sup>8</sup>

Due to the alpine topography of the canton of Valais, the protective function of the forest is vital. 87 percent of the Valais forest is classified as protective forest.<sup>9</sup> This means that the forest plays a decisive role in protecting settlements and transport routes from natural hazards such as landslides, avalanches and rockfall. According to the legislation of the Confederation as well as of the Canton of Valais, the maintenance of the protection forest is essentially aimed at preserving the protective function. Utilisation is based on the principle that wood extraction may not exceed natural stand renewal.<sup>10</sup>

### Forestry and timber industry

The most important sub-sectors of the forestry and timber industry are forestry, the sawmill industry as well as carpentry, joinery and other timber construction processing companies. Industrial processing of wood is not widespread in the canton of Valais.<sup>11</sup>

In 2019, 103'554 cubic metres of wood were cut in the Valais forest. Out of this, 40,4 percent was stemwood, 13,1 percent industrial wood and 46,5 percent energy wood.<sup>12</sup> As the graph below clearly shows, the amount of wood cut each year varies greatly:

<sup>6</sup> Statistics on the structure of enterprises. Federal Statistical Office.

<sup>7</sup> Swiss Forestry Statistics. Federal Statistical Office.

<sup>8</sup> Guide to the Valais Forest. Forest, River Engineering and Landscape Service, 2014.

<sup>9</sup> Yearbook Forest and Wood. Federal Office for the Environment, 2019.

<sup>10</sup> Cf. <https://www.vs.ch/de/web/sfcep/gestion-des-forets-de-protection>.

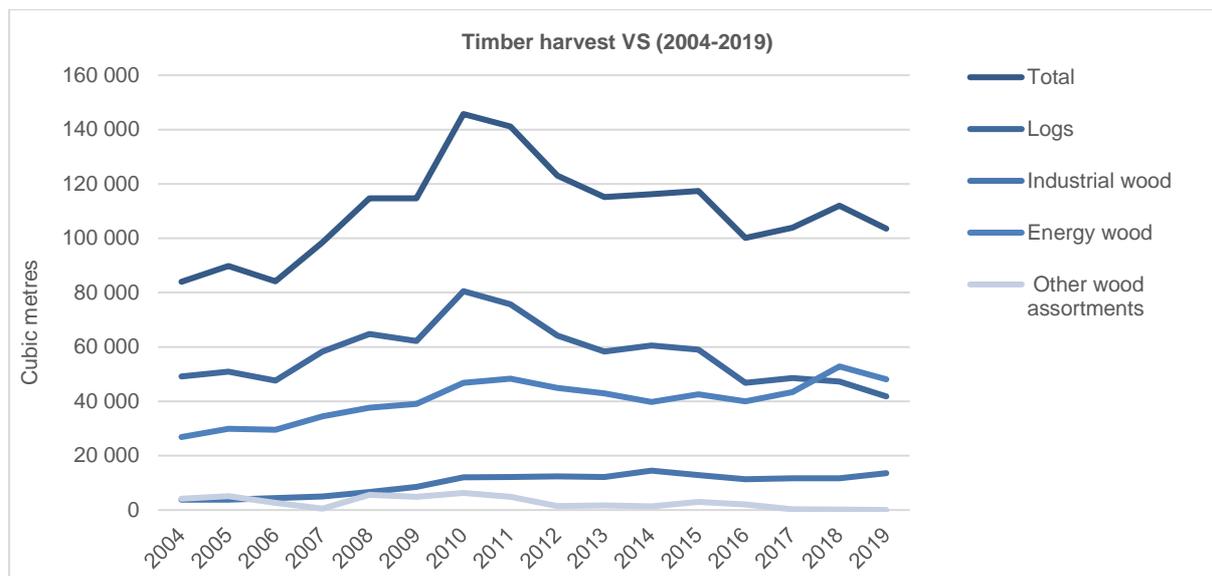
<sup>11</sup> Results of the interviews conducted as part of this study.

<sup>12</sup> Swiss Forestry Statistics. Federal Statistical Office.



## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)



Source: Swiss Federal Statistical Office, Swiss Forestry Statistics. Illustration SAB.

Between 2004 and 2019, the average annual timber harvest was 110'256 cubic metres. During this period, the largest timber harvest in terms of volume was in 2010 with 145'730 cubic metres.

The annual increase in forest area in the canton of Valais is estimated at around 1'000 hectares.<sup>13</sup> The volume of wood harvested is almost four times lower than that produced by the forest. The under-utilisation leads to a high proportion of forests that have a regeneration deficit. A resource policy that is more strongly oriented towards the use of wood is therefore an important concern of the canton and the forestry sector.<sup>14</sup>

### Forestry operations

In the canton of Valais, public forest owners usually entrust the care and management of the forest to forestry companies. These are mostly public-law corporations that carry out their tasks on behalf of the communes and in which the communes have a direct stake. In many cases, they are organised as special-purpose associations across municipalities. The canton of Valais currently has 34 forestry operations that take care of the management of almost 108'000 hectares of forest area.<sup>15</sup> In total, around 370 people were employed in the forest enterprises in 2019. Most forest enterprises employ fewer than 20 people.<sup>16</sup>

In addition to the harvesting of timber in the sense of sustainable forest management, the forest enterprises take on other tasks such as the maintenance of protective structures and paths. The use of the harvested wood varies depending on the quality. As a rule, the forest enterprises sell good quality roundwood to sawmills and planing mills in the region. Due to the high transport costs, roundwood sales to other cantons in Switzerland and abroad are insignificant. Lower quality wood is mainly processed into firewood and resold in the form of logs,

<sup>13</sup> Service for Forests, River Engineering and Landscape. Canton Valais.

<sup>14</sup> Cf. development of the forest & wood value chain in Valais. Lignum Valais, 2018.

<sup>15</sup> Service for Forests, River Engineering and Landscape. Canton Valais.

<sup>16</sup> Statistical data from the Valais Forest Association as per e-mail of 25.08.2020.



## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)

wood chips and pellets. In addition to the sale of construction timber and firewood, numerous forest enterprises also offer certain processed wood products made of solid wood, such as garden furniture, fountains, fences and shingles, for the local market. The processed wood products allow the companies to expand their supply and improve capacity utilisation. However, they only account for a small part of the turnover.

### *Sawmills*

According to information from the Valais Employers' Centre, the canton of Valais currently has 14 sawmills. 11 of these are micro-enterprises with fewer than 10 employees. Only one company has more than 20 employees. The number of employees is slightly more than 100 and has remained stable in recent years.<sup>17</sup>

The FSO wood processing survey shows that 45'757 cubic metres of roundwood were cut by Valais sawmills in 2017. Compared to the previous surveys, a clear decrease can be seen. In 2007, the volume of roundwood cut was 64'250 cubic metres, whereas in 2012 it was 51'230.<sup>18</sup>

Most sawmills produce mainly sawn timber. Here, demand is concentrated on better roundwood qualities from the region. In 2017, sawn timber accounted for around 60 percent of processed roundwood.<sup>19</sup> In addition to the sale of sawn timber, most sawmills also engage in timber trading. By selling processed products, they expand their range for local joineries and carpentries and ensure their profitability. Some sawmills also have a planing mill, which allows them to produce processed products such as panelling and shuttering.

### *Carpentries and joineries*

The register of the cantonal association lists 464 joineries and carpentries for the year 2020. Of these, 347 or 75 per cent are micro-enterprises with fewer than 10 employees. Only 5 businesses have more than 50 employees. The total number of employees in Valais joineries and carpentries is currently around 3'600 people.<sup>20</sup> Employment in carpentry and joinery has increased significantly over the last decade. In 2010, the businesses had a total of almost 3'200 employees.<sup>21</sup>

Most of the companies in this processing stage offer individual carpentry and joinery work and carry out renovations and conversions of wooden buildings. The range of products includes doors, windows, stairs, kitchen panelling, custom furniture, floors, load-bearing structures and façades. Some companies also offer complete new buildings made of wood. The corresponding market is becoming increasingly important. However, suppliers from other regions of Switzerland are strongly present.

### *Industrial processing*

---

<sup>17</sup> Statistical data from the Valais Employers' Centre as per email of 22.09.2020.

<sup>18</sup> Wood processing survey 2007, 2012 and 2017. Federal Statistical Office.

<sup>19</sup> Wood processing survey 2017. Federal Statistical Office.

<sup>20</sup> Statistical data from the Valais Employers' Centre as per email of 22.09.2020.

<sup>21</sup> Statistical data from the Valais Employers' Centre as per email of 22.09.2020.



## Smart SMEs

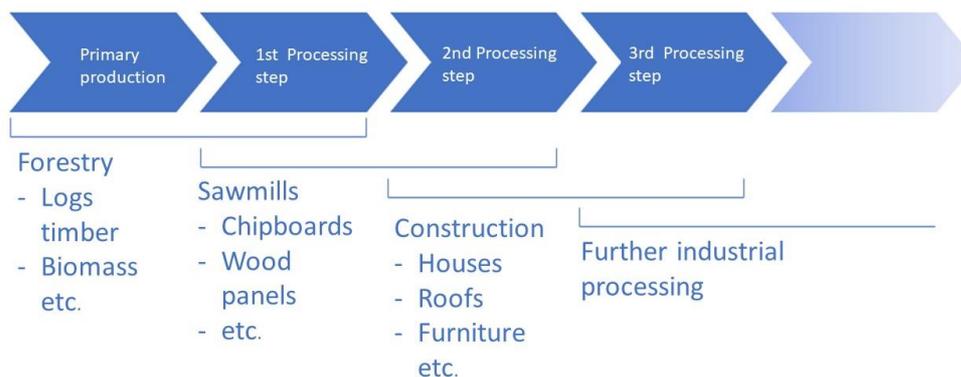
Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)

The canton of Valais has no developed capacities for the industrial processing of wood.<sup>22</sup> For topographical reasons, transport costs are also very high. The potential for the sale of industrial wood is therefore extremely low. Due to the positive trend in timber construction, there is at the same time a growing demand for wood for use in buildings. Glued laminated timber products are often used here.

From the point of view of the wood producers and wood processors umbrella association “Lignum”, the lack of regional production in this area weakens the timber value chain as a whole, as the sales opportunities for the harvested timber are relatively limited and at the same time demand cannot be met with regional products. Therefore, a feasibility study on the construction of a cross-laminated timber plant as a secondary processing facility in Valais is currently being examined.<sup>23</sup>

### Schematic representation of the wood value chain

The wood value chain in Valais can be represented schematically as follows:



Source: Illustration SAB

### Challenges and potentials

The sales situation for wood in Switzerland is fundamentally difficult. From a long-term perspective, prices for raw wood have fallen sharply.<sup>24</sup> Additional negative effects on the price situation arose in recent years as a result of storm-related excess quantities of harvested wood. This led to a massive oversupply in particularly affected areas of Switzerland and to a further decline in prices. Finally, the unfavourable exchange rate of the Swiss franc to the euro since the financial crisis exacerbated the competitive situation.

Specific factors that are important for the forestry and timber industry in the canton of Valais are the high costs of timber harvesting due to the mountain topography, the limited potential for mechanisation and the transport costs from the side valleys to the Rhone Valley. Due to the tonnage restrictions on the mountain roads, these are often higher than those from the Swiss Plateau to the Valais.<sup>25</sup>

<sup>22</sup> Results of the interviews conducted as part of this study.

<sup>23</sup> Development of the forest & wood value chain in Valais. Lignum Valais, 2018.

<sup>24</sup> Development of raw wood prices and labour costs in forestry. A time series from 1919/1939 to 2014. University of Applied Sciences Northwestern Switzerland, 2015.

<sup>25</sup> Cf. development of the forest & wood value chain in Valais. Lignum Valais, 2018.



At the same time, there are trends both in Switzerland and in the European environment that have a positive impact on the potential of the timber value chain. The construction market, which is running at a high level overall and has not yet been much affected by the Corona crisis, is contributing to an intact demand in the areas of timber construction and interior finishing. The promotion of energy production from renewable sources in the course of the energy turnaround is also creating new sales opportunities for wood.<sup>26</sup>

The wood value chain in the canton of Valais is benefiting from these positive developments. In particular, it can be seen that interest in the use of local wood is increasing. However, local businesses are only partially able to provide the products that are in demand on the market. This is the case, for example, in the area of chipboard products. Corresponding production is not available in the region to a sufficient extent.<sup>27</sup>

Against the backdrop of these challenges and opportunities, in 2018 Lignum Valais, the Valais wood and forestry sector association, presented its strategy for developing the forest & wood value chain in Valais. The following three priority measures were identified to develop the value chain:<sup>28</sup>

- Strengthening communication on indigenous wood
- Feasibility study of a secondary processing plant
- Increase in the amount of timber harvested

The development of the wood value chain was also the subject of the interviews conducted as part of the present study. The analyses largely coincide with the conclusions of the Lignum Valais project. Overall, the people interviewed emphasise the importance of regional cooperation and the corresponding potentials. Positive developments with regard to strengthening the value chain are mentioned:

- Increasing sensitivity for regional products and growing importance of traceability
- Positive trend in timber construction in line with the traditional importance of wood as a building material in the Alpine region
- Growing importance of wood in the energy sector
- Good cooperation within the value chain thanks to the small size of the Valais and the geographical proximity of the companies

Challenges for the wood value chain are mentioned:

- Lack of price competitiveness of domestic wood products due to the unfavourable market situation and import pressure
- Insufficient harvesting and cutting of timber
- Insufficient regional sales opportunities for raw wood due to the low diversification, the small number of further processing companies and the high transport costs.
- Qualitative challenges due to the special characteristics of mountain timber
- Insufficient regional availability of certain wood products, especially in timber construction

---

<sup>26</sup> Cf. analysis and synthesis of the forest and wood value chain in Switzerland. Bern University of Applied Sciences, 2014.

<sup>27</sup> Cf. development of the forest & wood value chain in Valais. Lignum Valais, 2018.

<sup>28</sup> Development of the forest & wood value chain in Valais. Lignum Valais, 2018.



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

- Lack of lobbying and marketing for the use of indigenous wood products
- Complex standards and requirements in timber construction as well as a partial lack of specialist knowledge
- Unclear impacts of climate change on the availability of wood as a resource

Despite these challenges, the interviewees were of the overall opinion that the conditions are in place to further strengthen the wood value chain in Valais in the coming years.



## Digitisation environment and innovation promotion

### Cantonal level

The Canton of Valais has numerous instruments at its disposal to promote digitalisation and the innovation potential of the economy. The basis for the internal administrative measures is the IT strategy 2015-2024 adopted in 2015, which provides for the renewal of the canton's IT infrastructure. Annual investments of around CHF 9 million are planned for this over a period of 10 years. The modernisation of the IT infrastructure was completed in 2018. In the next phase of the strategy, the focus will be on the development of technical solutions in the area of e-government.<sup>29</sup>

In 2017, the canton of Valais joined the digitalswitzerland location initiative. This is a joint project of the public sector, the private sector and universities that aims to position Switzerland as an attractive economic area for start-ups, companies and talent and to support companies in their digitisation processes.<sup>30</sup>

Business Valais has been entrusted with the cantonal business promotion. This promotion agency offers numerous services for businesses. The offer includes coaching and consulting, financial support, networking, technology transfer and offers in the area of education and training.<sup>31</sup>

In addition to Business Valais, the canton of Valais founded “The Ark Foundation” in 2004, whose activities are focused on promoting innovation, knowledge and technology transfer and supporting start-ups. The Ark is present in several locations and offers numerous services to SMEs in particular. The thematic focus is on information and communication sciences, life sciences, energy and the environment. In line with the national innovation strategy, The Ark is involved in cross-cantonal networks. The foundation's activities are primarily financed by public funds from the federal government, the canton of Valais and some Valais municipalities. In 2018, The Ark had a total budget of around CHF 6.5 million.<sup>32</sup>

### Supracantonal level

At supracantonal level, the Canton of Valais is involved in the Regional Innovation System (RIS) of Western Switzerland. Regional innovation systems are a federal funding measure. They were created as part of the Confederation's regional policy to support the innovation potential at regional level. The services offered are primarily aimed at SMEs and mainly include coaching measures.<sup>33</sup>

The competence centres for regional development “Antenne Valais Romand” and “RW Oberwallis”, which emerged from the federal government's regional policy, are the contact partners

---

<sup>29</sup> [IT strategy 2025-2024 of the State of Valais](#). Media release dated 7 September 2015.

<sup>30</sup> [www.digitalswitzerland.com](http://www.digitalswitzerland.com).

<sup>31</sup> [www.vs.ch/fr/web/entreprises](http://www.vs.ch/fr/web/entreprises).

<sup>32</sup> [www.theark.ch](http://www.theark.ch).

<sup>33</sup> Cf. <https://regiosisuisse.ch/regionale-innovationssysteme-ris>.



## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)

of the cantonal economic development agency Business Valais in their respective regions and also take care of digitisation projects.<sup>34</sup>

### Federal level

In addition to the cantonal and supracantonal instruments, Switzerland also has an agency for innovation promotion at the federal level, Innosuisse. As a federal institution under public law, Innosuisse is entrusted with the task of promoting science-based innovation in the interest of the economy and society. For this purpose, the agency receives federal funding of around CHF 200 million per year.

Innosuisse's activities include project funding, networking, training and coaching. Certain instruments are specifically geared towards the implementation of research-based innovations by SMEs. These include, for example, innovation mentoring, which aims to support companies with fewer than 250 employees in implementing innovative projects.<sup>35</sup>

The State Secretariat for Economic Affairs maintains an SME portal that provides small and medium-sized enterprises with practical knowledge, online services for administrative matters and articles on current topics. The portal also includes resources on the digital turnaround and a listing of the corresponding support services for businesses.<sup>36</sup>

### Educational and research institutions

In addition to the institutions and instruments explicitly geared towards advising and supporting businesses, the research institutes and universities play an important role in strengthening the innovation potential of the economy and promoting the use of new technologies. The University of Applied Sciences Valais (HES-SO Valais-Wallis) has 9 application-oriented research institutes and carries out numerous projects with industrial partners.<sup>37</sup> The “Idiap” research institute specialises in artificial intelligence and implements a knowledge and technology transfer programme.<sup>38</sup> EPFL Lausanne has been present in the cantonal capital of Sion since 2014. The site now consists of 10 laboratories in the fields of energy, environment and health.<sup>39</sup>

Educational and research institutes that deal specifically with wood and forestry are lacking in Valais. The most important institution in this field in Switzerland is the “Centre for Wood” at the Bern University of Applied Sciences in Biel.<sup>40</sup> The research activities of this institution aim to develop technologies, processes and know-how for the use of wood along the entire value chain and to make these available to users.

### Private research expenditure

According to the latest survey by the FSO, private companies in Switzerland bear 69 per cent of the annual expenditure on research and development. In 2017, the corresponding funds amounted to CHF 15.7 billion. 84 percent of these funds were provided by large companies,

<sup>34</sup> [www.regionvalaisromand.ch](http://www.regionvalaisromand.ch), [www.rw-oberwallis.ch](http://www.rw-oberwallis.ch).

<sup>35</sup> Cf. [www.innosuisse.ch/inno/de/home/be-connected/mentoring.html](http://www.innosuisse.ch/inno/de/home/be-connected/mentoring.html).

<sup>36</sup> [www.kmu.admin.ch](http://www.kmu.admin.ch).

<sup>37</sup> [www.hevs.ch](http://www.hevs.ch).

<sup>38</sup> [www.idiap.ch](http://www.idiap.ch).

<sup>39</sup> [www.epfl.ch/about/campus/valais-en](http://www.epfl.ch/about/campus/valais-en).

<sup>40</sup> [www.bfh.ch/ahb/de/holz/](http://www.bfh.ch/ahb/de/holz/).



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

16 percent by SMEs. <sup>41</sup>No statistical data is available for the canton of Valais. However, analogous to the statistics for Switzerland as a whole, it can be assumed that the private sector also contributes a large share of research expenditure at the cantonal level, especially since the canton has numerous internationally active companies with their own research and development departments. Important sectors are pharmaceuticals, chemicals and biotechnology. Information and communication technology is also represented. With regard to the <sup>42</sup>role of private companies in the research and innovation environment, the question arises to what extent smaller companies without development departments are integrated into the corresponding networks. The interviews conducted as part of the present study show that companies in the forestry and timber industry are hardly in exchange with companies in other sectors.

### Digital infrastructure

In the area of digital infrastructure, a study conducted on behalf of the State Secretariat for Economic Affairs (SECO) in 2019 shows that in both Upper Valais and Valais romand, the average upload and download speeds available to businesses are below the Swiss average. The differentiated data from the broadband atlas makes it clear that the available download rates in the side valleys of the Rhone plain are in part below 100 Mbit/s. When uploading data, the available data transmission rates are generally even lower. <sup>43</sup><sup>44</sup>Projects are currently being implemented to ensure the provision of fibre-optic technology to the municipalities of the Valais, both in the Rhone Valley and in the side valleys. <sup>45</sup>

Despite regional differences, mobile network coverage is generally guaranteed in populated areas. Transmission is mostly based on fourth generation (4G) mobile telephony. Gaps still exist in uninhabited areas. This is relevant for forestry in that timber harvesting sometimes takes place in places where mobile reception is not available. In 2019, mobile providers began upgrading their antennas to 5G technology. Due to open questions at the regulatory level, it is currently not foreseeable in what timeframe the full potential of fifth-generation mobile communications will be available. <sup>46</sup>

---

<sup>41</sup> Research and Development Synthesis Switzerland. Federal Statistical Office.

<sup>42</sup> Cf. <https://www.valais.ch/de/info/landingpage/industrie>.

<sup>43</sup> Broadband coverage in the target areas of the New Regional Policy. Hanser Consulting, SECO, 2019.

<sup>44</sup> [www.breitbandatlas.ch](http://www.breitbandatlas.ch).

<sup>45</sup> Cf. [www.danet-oberwallis.ch](http://www.danet-oberwallis.ch). DANET's goal is to provide the Upper Valais with a nationwide fibre-optic network.

<sup>46</sup> Federal Council media release dated 22.04.2020.



## Degree of digitisation of the companies

### General remarks

Various studies published in recent years have come to the conclusion that there are great differences in the degree of digitalisation among SMEs. They depend on the industry, the business model, the size of the company, the financial resources and the know-how.<sup>47</sup> In general, it is noted that digitisation is a particular challenge for SMEs. Due to their small structures and limited resources, companies of this size take comparatively large risks when investing in digital solutions and new technologies. Access to the necessary know-how can also be associated with difficulties, as SMEs generally participate less in knowledge and technology transfer than larger companies. Finally, SMEs benefit to a lesser extent than the latter from the instruments of public innovation promotion.<sup>48</sup>

These general observations also apply to the forestry and timber industry in the canton of Valais. Most of them are small businesses with a craft orientation, in which manual work and the associated specialised expertise are traditionally of great importance. As a rule, the focus is on customised products for the regional market. Since there is no industrial production for the manufacture of mass products in the true sense, the economies of scale associated with automation are also less pronounced than in other sectors or companies. In primary production, i.e. timber harvesting, the complexity of the forest ecosystems and the lack of infrastructure also limit the possibilities for using new technologies and automated processes. In Valais, which is characterised by mountain forests, additional difficulties arise from the topographical conditions.<sup>49</sup>

Despite these specific challenges, numerous digital applications are already being used in the forestry and timber industry. Examples include computer-assisted forest inventories, tomographic systems for cutting logs and 3D IT solutions for carpentry and timber construction. In addition to these sector-specific tools, digital solutions in the sense of standard applications are also used in administration, personnel planning, marketing and logistics.<sup>50</sup>

In addition, there are various initiatives that pursue the goal of harnessing the potential of digital technologies for the timber and forestry sector. As part of its Wood Action Plan, the Confederation supports, among other things, applied research and development projects that contribute to strengthening the forest and wood value chain. Around 4 million Swiss francs are available annually for projects under the Wood Action Plan.<sup>51</sup> In the area of research, the Centre for Wood at the Bern University of Applied Sciences launched the Forest & Wood 4.0 initiative in 2018. The initiative, which<sup>52</sup> is carried out as a network together with the sector associations of the timber and forestry industry and companies, pursues the goal of identifying concrete

<sup>47</sup> Digitalisation - where do Swiss SMEs stand? PwC Switzerland, Google Switzerland, digitalswitzerland, 2016.

<sup>48</sup> Cf. Research and Innovation in Switzerland. State Secretariat for Education, Research and Innovation, 2020.

<sup>49</sup> Results of the interviews conducted as part of this study.

<sup>50</sup> Cf. "Much is possible, but still unclear". Forest and Wood No. 4, 2020.

<sup>51</sup> [www.bafu.admin.ch/bafu/de/home/themen/wald/fachinformationen/strategien-und-massnahmen-des-bundes/aktionsplan-holz.html](http://www.bafu.admin.ch/bafu/de/home/themen/wald/fachinformationen/strategien-und-massnahmen-des-bundes/aktionsplan-holz.html).

<sup>52</sup> [www.wh40.ch](http://www.wh40.ch).



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

optimisation opportunities at all processing stages that result from digital solutions. Instruments are to be developed for the following topics:

- Order processing in the construction industry
- Data exchange in the production network
- Future business models
- Changing customer needs
- Digital connection forest/first processing stage
- Competences for the future

Finally, the industry associations in the wood and forestry sector are also addressing the digital transformation and are active in various areas, namely in knowledge transfer and further education.

### **Digitalisation as part of the corporate strategy**

The general importance that companies attach to digitalisation as part of their strategy was the subject of the interviews conducted as part of this study. The interviews make it clear that all companies deal with digitalisation and generally pay a lot of attention to the topic.

Even if the companies do not have a digital strategy in the true sense, the corresponding possibilities and innovations are discussed in the management committees or included by the company manager in his considerations for the further development of the company. With regard to the importance attached to digitalisation, there are no major differences between the companies at the various processing levels. However, several company managers point out that manual craftsmanship remains a key success factor for the forestry and timber industry and the quality of its products despite digitalisation. In certain areas of activity, for example in assembly, there is no great gain from digitalisation. Similarly, the manager of a sawmill states that the performance of the machinery is decisive for him.

The surveyed associations state that the companies are dealing with digitalisation and are striving for corresponding solutions. With regard to carpentry and joinery, it is emphasised that many companies use digital solutions without being aware of it. This is an implicit use of new technologies, which is usually not linked to the formulation of a strategy. It is also noted that the level of development of companies at this stage of processing varies greatly and that the "digital divide" continues to grow. The size of the enterprise as well as the age and the technology affinity of the company manager are named as determining factors for the different degree of digitalisation. The use of new technologies is closely related to the affinity and knowledge of the company manager in the IT sector.

### **Assessment of the potentials and risks**

The interviewees consistently associate digitalisation with opportunities and new potential for the companies. Despite different weightings depending on the processing stage and operational orientation, the availability of new technologies is basically classified as profitable for the company as well as for the value chain as a whole. Advantages are recognised in all areas of activity. Frequently mentioned keywords are:

- More efficient management thanks to clearly defined processes and a better overview



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

- More efficient administrative processes
- New possibilities of personnel management (recording of hours, allocation of hours to projects, provision, etc.)
- Better planning options, for example in logging, warehouse management and transport logistics
- Optimised order entry and processing
- Higher profitability thanks to more efficient processes and cost reductions in production
- Strengthening competitiveness and increasing turnover
- Better visibility and expansion of sales channels, especially thanks to the internet and social networks
- Enhanced communication possibilities with customers and improvement of the customer experience
- Linking the different areas of activity of the company
- Greater coordination and cooperation within the timber value chain, in particular thanks to the compatibility of the planning tools used

The risks in connection with digitalisation are assessed in a differentiated manner. Several company managers state that the situation in the forestry and timber industry cannot be compared with that in other sectors. The predominantly regional orientation of the businesses, the great importance of specific expertise and craft know-how as well as the challenging topographical conditions reduce the risk of market displacement by new players or business models. At the same time, the dangers that can arise for the companies from digitalisation are not denied. The company managers identify risks and negative developments in the following areas in particular:

- Growing price and competitive pressure due to national and international online trade
- Price cuts and reduction of margins
- Market displacement of small companies that cannot keep up with the automation and innovation steps for reasons of cost and time
- Increasing competitive pressure in the area of certain prefabricated products, namely in timber houses (prefabricated houses)
- Loss of market segments due to automation and the increasing availability of mass products
- Rapid pace of technological change
- Staff being overstrained

The inter-company cooperation on digitalisation issues is viewed critically in some cases. This is not developed enough to cope with the challenges ahead.

### **Application areas of digital technologies**

The interviews provide an overview of the use of digital applications by the companies. The following areas were addressed: Purchasing, production, logistics, marketing and sales, management and inter-company applications.

#### *Purchasing*



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

The interviews show that individual companies are looking into the use of digital technologies in purchasing. The usefulness of webshops for orders is emphasised in several cases. According to some company managers, such offers facilitate the ordering process because, unlike with conventional systems, precise information on the availability of products and delivery times is directly accessible. At the same time, it is noted that the forestry and timber industry is much less advanced than other sectors in terms of digital ordering channels. Most orders from suppliers are still placed via scanned documents or e-mail. This makes it impossible to reliably trace the order.

Despite the advantages of digital solutions in purchasing, there are limits to their application in the view of various interviewees. The processing companies consider it important to check the quality of the wood on site before purchasing. An internet-based application is not a suitable alternative for this. In addition, companies often turn to partners for deliveries with whom they have been working for years. This results in a certain degree of security with regard to the quality of the products. In the case of internet orders outside the existing network of suppliers, it cannot be assumed with certainty that the quality meets the requirements.

### *Production*

Digital technologies are widely used in the production of the forestry and timber industry. Depending on the processing stage, there are different applications.

Due to the difficult topographical conditions, there are fewer automation options for logging in mountain forests than in flat terrain. The importance of manual work for forestry is therefore emphasised in the interviews with the *forest enterprises* and the Valais Forest Association. Nevertheless, digital technologies are also used in primary production. For example, one forestry operation bases its planning work for silviculture on a GIS application. For this purpose, the corresponding GPS points were collected in the field. The data can be retrieved by the employees via a tablet that they take with them into the field. At the same time, the company uses a digital application to plan the cable crane lines for timber transport. This allows the most favourable location of the cable winches to be determined. Another forestry operation uses the « SylvaMet » application, among others, for logging planning and related tasks. This offers various functions in the area of inventory, management and location of timber volumes. The potential of digital technologies for logging planning and inventory of timber volumes is considered high by all interviewees. The main difficulty in this context is the lack of sufficiently precise maps that provide information on timber volumes and tree species. However, the necessary improvements could not be achieved at company level.

In *sawmills*, the performance of the machines is seen as crucial for the efficiency and quality of production. Digital interfaces are applied in the planing sector. From the point of view of the manager of a sawmill, the application possibilities of digital technologies in the sawing area are smaller than in timber construction. There would be a technical limit with regard to the efficiency gain in wood cutting. One small company contacted refrains from digitally supported production, as the use of such technology is not worthwhile in view of the small amount of timber cut.

The interviews make it clear that digital applications to support production are widespread in the *joineries and carpentries*. The majority of the contacted companies have CAD (computer-



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

aided design) drawing programmes that are directly linked to the production machine via an interface. From the point of view of the company managers, this linking of planning and production increases efficiency and reduces the personnel required to operate the machines. In the sense of expanding the interfaces, one company has also created the possibility of reading measurement recordings directly into the CAD programme and preparing them there.

In a medium-term perspective, individual companies are looking at applications in the BIM area (Building Information Modelling). This is an IT-supported method of networked planning and execution of buildings. The cross-divisional digital modelling of all building data allows for better exchange between the various actors involved in a construction project. The basis of the application is a common, constantly synchronised database that can also be consulted on the construction site. However, with regard to implementation, there are numerous technical challenges, namely concerning the compatibility and coordination of the software solutions used within the industry.

Notwithstanding this potential, some companies also recognise limits to the use of new technologies in timber construction. In the case of renovations and conversions, for example, the possibilities are limited because a large part of the work is done by craftsmen and can only be automated to a limited extent.

### *Logistics*

According to the information obtained in the interviews, the application of digital solutions in transport logistics and warehouse management is not very advanced compared to production. The corresponding approaches are currently still at the project stage. One of the forestry companies visited intends to link customer data recorded in the company's ERP (Enterprise Resource Planning) programme with logistics. Transport logistics are to be optimised by means of an automatic measurement of the storage level of pellet silos. Another forestry company is developing a digital solution in connection with a district heating project. This is to be used in the planning of around 5,000 annual truck journeys.

Despite the small number of existing applications, digital solutions in the logistics sector are met with great interest. This is due in particular to the high transport costs and practical challenges in warehouse logistics. With regard to the assessment of the relevant potentials, there are clear differences depending on the size class of the companies.

The smallest companies contacted consider digital solutions in logistics to be useful and important in principle, but do not see any immediate need for action at company level. Larger companies hope that digital applications will optimise transport journeys and warehouse logistics. The latter point is particularly important because many of the companies contacted are confronted with space problems. Similarly, it is considered useful to better align transport logistics in timber construction with construction site planning by loading vehicles and trailers according to the planned work steps. Transferred to the entire timber value chain, according to one interviewee, there is the possibility of using digital solutions to optimise the flow of goods from the forestry operation via the sawmills to the construction site.

### *Marketing and sales*



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

The interviews show that all businesses are engaged in digital marketing and sales strategies and use corresponding tools. The company's online presence is generally considered important. In addition, the managers interviewed unanimously believe that digitalisation opens up new opportunities in marketing and sales. A company's own website and social media are the most frequently used means to ensure the company's online presence.

Regardless of their size, all contact businesses have a website, which has either been renewed in recent years or is soon to be modernised. In most cases, the website provides an insight into the activities of the business and presents the most important products. The usefulness of the website is undisputed in all companies, even if the effort for updating it is considered high. From the point of view of the company managers, the website is an indispensable means of ensuring a minimum online presence. In certain cases, it also helps to attract new customers and increase turnover.

Webshops in the actual sense are currently still an exception, although many of the interviewed company managers have already looked into such solutions. The technical effort required to set up a webshop is often seen as disproportionate. The managers of micro-enterprises in particular also recognise difficulties in operating a webshop, namely with regard to the availability of products, transport logistics and delivery times. Finally, due to the primarily local orientation of most businesses, the additional market potential that can be tapped with online sales channels is seen as limited. Notwithstanding these challenges, the interviewees assume that the importance of web shops will increase in the future as a result of the changed buying behaviour of younger people in particular.

One forestry company that already has a web shop considers the response achieved so far to be low. The costs of the web shop have not yet been offset by additional orders. However, the web shop makes it possible to reach customers outside the traditional area of the company. Possible alternatives for webshops are complete price and product catalogues on the internet as well as the presence on established online sales platforms of the timber industry.

In addition to the website, the companies use social media channels to increase their visibility. Facebook, Instagram and LinkedIn were mentioned in the interviews. The use of these online networks vary in the companies. For time reasons, not all company managers are able to ensure a regular presence on the social media channels, even if accounts have been set up. In three companies, the online networks are systematically used to publicise the company's activities and products. One larger company has explicitly entrusted this task to some of its employees.

The experiences of businesses that make greater use of social networks are unreservedly positive. From the point of view of the interviewed persons, social media not only increase the visibility of the companies, but also create new customer contacts and increase turnover. One business manager interviewed believes that online networks are much more efficient for marketing than the website. They also allowed to compensate for traditional deficits of the forestry and timber industry in this area.

A more extensive use of digital means beyond the instruments mentioned does not currently take place in the companies. Nevertheless, the development potential that digitalisation brings to sales is seen as great. This applies in particular to applications in the area of virtual reality,



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

which create a new customer experience. Such technologies are of particular interest in timber construction, as they allow the customer to directly adjust properties of the object, such as structures and colours. In architecture, it is possible to allow the customer to experience the space virtually. However, these are complex applications that overtax businesses in terms of personnel as well as technically and financially. As an alternative to online applications in the field of virtual reality, 3D visualisations of objects are used to a limited extent in customer contacts.

### *Administrative processes and management*

All of the companies contacted use digital applications to simplify the handling of internal administrative processes. The degree of digitalisation of these internal processes depends strongly on the size of the company. Smaller companies with few employees sometimes do without elaborate technical systems, as the associated investments are considered too high and the efficiency gains too low. In some cases, the companies use standard applications for administration and accounting. The following examples of the use of digital technologies in administration were mentioned in the interviews:

- Order entry, management and invoicing
- Preparation of quotations and post-calculation
- Address recording
- Digital archiving
- Personnel planning and working time recording
- Accounting and finance
- Material orders

Several companies have created links between some of these areas on their own initiative in order to achieve efficiency gains in this way. In particular, digital solutions are being used in the timber construction sector that make it possible to link working time recording with order management and invoicing. Workers enter their hours via their smartphone. These are assigned to the various projects and construction sites and flow into the order management via an interface. The post-calculation of the orders can be generated automatically in this way without having to calculate or enter the working time again. There is also a link with payroll accounting.

Similarly, one company is currently implementing a project in cooperation with the industry association that aims to unite all aspects of human resources on a digital platform. The platform is not only intended to simplify the recording of working hours and payroll accounting, but also to serve as a means of communication, for example, by informing employees about training opportunities. Analogous to this use, a company intends to unite all work steps from the offer to the order confirmation to the execution, invoicing and post-calculation in one system within the next few years.

A forestry company recognises great potential in process management. Digital solutions could help to ensure continuity in the event of staff changes and replacements. Corresponding processes would also allow processes to continue seamlessly regardless of the personnel constellation.



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

From the point of view of the companies that have consistently implemented processes to digitise administrative processes, the solutions found are associated with numerous advantages. In addition to the gain in efficiency in terms of time and the necessary resources, they also refer to the better traceability of orders, the clean archiving and the lower susceptibility to errors of digital systems. In contrast, some of the micro-enterprises contacted criticise the high effort required for the implementation of digital solutions in the administrative area as well as the complexity and lack of user-friendliness of the IT applications.

### *Supra-company applications*

Several interviews show that inter-company digital applications offer great optimisation potential for the entire timber value chain. In the view of some company managers, such solutions could improve logistical processes and increase efficiency in timber construction. With regard to timber construction, applications in the BIM area are of particular interest, which allow the planning and production levels to be linked across companies and occupational groups by means of a common platform. One main difficulty in this context is that the various players in timber construction use different IT solutions. For this reason, the implementation horizon of the corresponding projects is considered to be extremely long.

Another area of application for inter-company digital solutions concerns the preparation of offers. A common platform of all relevant professional groups in timber construction would make it possible to quickly calculate the price of a timber construction in different variants and designs for the benefit of customers and architects. In this area, too, different programme standards make cooperation between the companies difficult.

Inter-company digital solutions are also seen as important for practical reasons. Many companies in the forestry and timber industry do not have the strategic size to build complex digital applications on their own. Cooperation with other companies is therefore essential. According to one company manager, digital innovations could be implemented much faster if greater importance were attached to the exchange of experience between companies. Often a lot of time is lost working out solutions at company level. This weakens the competitiveness and efficiency of the wood value chain as a whole.

### **Investment in digitisation projects and cost-benefit ratio**

The interviews show that the companies' investments in digitalisation projects are generally high. They concern in particular the area of digitally supported machines as well as IT applications, licence fees and websites.

The extent of the investments cannot be precisely quantified or compared between the individual companies. Nevertheless, the interviews conducted show that, depending on the size of the company, between 5,000 and 25,000 Swiss francs are invested annually in updating software solutions, internet presence and new programmes. In the case of individual projects such as programmes and interfaces specially developed for the business, the costs can be even higher. In addition, there are amortisation costs and licence fees. According to an operations manager, investments in digitalisation have increased significantly in recent years. It is one of the areas where the highest costs are incurred. Unlike machines, which can be used for twenty



## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)

to thirty years, digitalisation requires continuous investment, not only financially, but also in the areas of training and information.

Most of the company managers interviewed consider it difficult to precisely quantify the cost-benefit ratio of digital solutions. Nevertheless, the general view is that the investments are worthwhile from a business perspective. The benefits are seen in improved productivity, increased profitability and generally a strengthening of the company's competitiveness. With regard to turnover gains, reference can be made to the example of a micro-enterprise which, thanks to the new website, generates additional orders amounting to around 30'000 to 50'000 Swiss francs annually. In production, added value results from the new technological possibilities associated with digitalisation.

Despite these various advantages, the cost-benefit ratio is also assessed critically, namely by representatives of smaller companies. From the point of view of a business manager, digital solutions can also lead to greater effort if, for example, the operation is not intuitive enough for the employees. Depending on the size of the business, a digital solution may not be worthwhile.

### **Measures for staff qualification and further training**

The interviews make it clear that the qualification of staff is seen as a central factor in being able to successfully implement digital solutions. At the same time, they show that dealing with digital machines and applications requires new qualifications.

The managers are unanimous in their opinion that the requirements in the IT sector are becoming more and more demanding and that the professional profiles in the forestry and timber industry are therefore also changing. Although manual work remains important, IT skills are increasingly in demand. Due to the new technological possibilities, there is partly a shift of jobs within the companies. In timber construction, for example, the need for personnel in the areas of planning and drawing is increasing, while fewer employees are needed to operate the machines. Several company managers recognise this development as an opportunity to further develop the professions in the forestry and timber industry and to address people with other qualification profiles. It is also pointed out that digital skills must play a more important role in training in the future. Corresponding projects, which are specifically aimed at apprentices, are currently being implemented.

In general, the interviews show that the company managers attach great importance to the qualification of the staff. The expertise of the employees is seen as crucial in order to ensure the competitiveness of the business in the long term and to be able to take advantage of opportunities on the market. For this reason, the companies support their staff in training and further education and recognise an added value in corresponding measures.

The approaches that are followed are very different. When purchasing a digitally supported machine or a new IT application, the training of the employees is in most cases ensured by the supplier, according to information from the company managers. In addition, larger companies organise internal training for their employees. In some companies, internal training measures are primarily aimed at members of the management. The person in charge of a micro-



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

enterprise states that due to the small size of the company, no internal further training is offered in the actual sense.

The interviews make it clear that most of the companies are aware of external further training offers. These are provided by professional associations and educational institutions outside the canton of Valais, among others, and concern the most diverse areas of the forestry and timber industry. Aspects of digitalisation and new technologies are not necessarily in the foreground. The use of these offers by the companies seems to be limited. According to a company manager, the further training offers are not always sufficiently geared to the specific tasks that the employees take on. Further difficulties can result from a lack of time availability, the geographical distance of the further training institutions as well as the partial lack of interest or the insufficient basic knowledge of the employees. In addition, it is mentioned that employees in the forestry and timber industry are more interested in manual activities than in partly complex IT applications due to their job profile.

Finally, the age of the employees is also addressed in connection with the qualification of the staff and further training offers. Several company managers point out that younger employees are more willing to attend further training and to deal with digital solutions. Well-trained younger employees always bring new knowledge with them, which can then be implemented at the company level. In view of the challenges of digitalisation, a young workforce is therefore an advantage.

### **Public support and innovation networks**

Even though the companies contacted are generally aware of the support options in the area of innovation and digitisation, only very few actually make use of such instruments. Only one company approached a public agency to finance an innovative project. This was a project focused on digitalisation in timber construction and carried out in collaboration with the Valais University of Applied Sciences (HES-SO). In this case, the project partners submitted a funding request to the funding agency Innosuisse.

The answers of all other company managers show that the instruments and vessels of innovation promotion are not seen as central for the further development and competitiveness of the company. Many companies also do not see any concrete added value for the company in the support measures. Practical reasons also seem to explain why the support offered by public agencies is hardly used. Individual company managers point out that the time required to submit applications is very high and associated with bureaucratic hurdles. Therefore, the company managers consider it more efficient to initiate innovations through their own networks and contacts. Finally, with regard to public support, it is noted that financial resources alone are of little help. It is important to have experts who can provide advice and training on the companies and communicate new project ideas.

In both the machinery and software sectors, companies rely mainly on the information provided to them by their suppliers and partners. The latter are expected to keep the companies informed about innovations and optimisation possibilities. Cooperation seems to meet the needs of most companies. Occasionally it is pointed out that commercial interests can be in the foreground during consultations. In addition, there was a risk of a dependency relationship with



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

the suppliers. Against this background, two company managers suggested the creation of an independent advisory body. Such a body would make it possible to be independent of the suppliers and to examine different options in the planning phase.

In addition to contacts with suppliers, the companies rely on trade fairs, magazines and internet research to inform themselves about the new technological possibilities. In some cases, contact is also sought with universities in order to evaluate optimisation potential and work out concrete projects. For example, one forestry operation carried out a project on the digitalisation of the supply chain with students from the University of Applied Sciences Northwestern Switzerland. Other companies are in selective exchange with the Wood Competence Centre in Biel. For certain companies, the respective cantonal association also plays an important role as a platform for inter-company exchange. Within this framework, technical questions can be discussed with other companies and information about ongoing projects can be passed on. Similarly, there are regional groups in the forestry sector that facilitate mutual information about company innovations. With regard to the exchange of companies with companies from other sectors on digital solutions, the interviews make it clear that this only takes place in individual cases and is limited to an informal framework.

### Practical challenges

In the interviews, the company managers were asked about any difficulties and obstacles that arise in connection with digitisation strategies. The answers make it clear that these exist in various areas. In particular, a lack of time and financial resources, unsuitable software and hardware, a lack of qualified personnel and insufficient cooperation at inter-company level were mentioned. The quality of the digital infrastructure is only perceived as an obstacle in a few cases.

#### *Lack of time and financial resources*

Lack of time and financial resources are mentioned as obstacles in connection with digitisation projects by several interviewees. This is especially the case in micro-enterprises, where often only one person takes care of operational innovations. It is also emphasised that digital solutions and the corresponding consultations are often expensive, without it being clear in advance whether there is really any added value for the company. There are also costs for training employees in the new technologies. The successful implementation of digital innovations therefore requires financial resources that are beyond the means of many companies.

#### *Unsuitable software and hardware*

From the interviews it emerges that the commercially available software applications only partially meet the needs of the enterprises. The complexity and the lack of flexibility of the programmes are criticised in particular. Many IT applications overburden the employees, who usually have little relation to the new technologies. In addition, it is difficult to adapt existing



## Smart SMEs

Co-financed by the European Parliament through the Alpine Region Preparatory Action Fund (ARPAF)

programmes to the specific needs of the companies. As an example in this context, reference is made to the software for preparing offers.

Industry solutions are used in various areas. However, their usefulness is judged differently. While some company managers recognise that the forestry and timber industry is lagging behind in the development of sectoral solutions, others are of the opinion that these often do not meet the needs of the companies sufficiently. For example, they do not take into account the diversification of enterprises, especially in forestry.

Another difficulty in the area of software concerns the compatibility of the programmes used. Several company managers regret that the various actors in the timber value chain have not yet agreed on common formats. This makes the exchange more difficult.

In addition to software, hardware is also addressed. From the point of view of an operations manager, there are certain limitations associated with the available devices. There are no devices on the market that are stable enough to be used on the construction site. In addition, larger laptops would be needed that would allow construction plans to be consulted outside the office.

### *Lack of qualified personnel*

The interviews confirm the central importance of staff for the implementation of digital innovations. Several companies contacted point out that the obstacles in connection with digitalisation are less in the technical area than in the personnel area. Due to the particularly pronounced shortage of skilled workers in Valais, it is generally difficult to find employees with the necessary qualification profiles. This could jeopardise the implementation of certain projects. The lack of young talent in certain professions also contributes to the fact that the starting position for operational innovations tends to be difficult.

Finally, various business managers note that there is a risk of overtaxing employees in connection with digitalisation. Digital solutions always bring with them the danger that staff will be left behind. This is related to the fact that IT skills have not been sufficiently taken into account in training so far.

### *Insufficient inter-company cooperation*

Some company managers see the lack of inter-company cooperation as a major obstacle to the successful implementation of digital projects. Many solutions would have to be developed or coordinated at inter-company level. However, in most cases this coordination does not take place. This delays many optimisations that would be important for the entire value chain.

### *Digital infrastructure*

With regard to the quality of the digital infrastructure, the interviews reveal a heterogeneous picture. In the majority of the companies contacted, there are no particular difficulties in connection with the internet connection. This is considered to be sufficient and in line with the needs of the company. Certain businesses in peripheral regions that are not yet connected to the fibre optic network were able to achieve improvements and increase the transmission



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

speed in cooperation with their internet provider or the municipality. In most cases, the remaining disadvantages are not considered decisive with regard to the implementation of digital solutions. At the same time, it is emphasised that the demands on the transmission rate will continue to increase in the coming years. Additional needs would arise namely from a switch to cloud solutions and decentralised servers as well as from the higher data volumes that have to be transmitted in connection with BIM applications.

One company manager considers the poor quality of the internet connection as a crucial obstacle to the implementation of digital solutions. Due to the insufficient transmission rate, many important projects could not be implemented. For certain applications, such as the synchronous transmission of construction plans to mobile devices, a fibre optic connection is indispensable.

Mobile phone coverage is mentioned in a conversation. The head of a forestry company states that the insufficient mobile phone coverage in certain alpine areas is problematic for carrying out the work.



## Conclusions

The interviews conducted as part of this study show how individual SMEs in the wood value chain in the canton of Valais are dealing with the challenge of digitalisation and what strategies they are pursuing in this regard. The most important findings are summarised below.

### *Open to new technologies*

Although the conditions for the application of digital solutions in the companies of the wood value chain are fundamentally more difficult than in other sectors, there is a regular and broad discussion of the new technologies in the companies. Regardless of their size, the companies attach central importance to the topic of digitalisation and strive to use corresponding applications based on their priorities and resources. Despite the traditional focus of most companies on craft activities, it is generally considered that digitalisation opens up new perspectives for the sector and has a strong impact on the competitiveness of companies. In addition, most business managers note that the topic is generally gaining in importance.

### *Selective improvements based on careful cost-benefit analyses*

The businesses contacted implement digital solutions in different areas. The most widespread applications concern marketing, production and internal processes such as accounting and bookkeeping. In purchasing and logistics, digital solutions are currently hardly widespread, even though individual companies are looking into corresponding optimisations. As a rule, the company innovations are not based on a digitisation strategy in which all areas of the company's activities are taken into account in the sense of an overall concept. Rather, the interviews make it clear that improvements are usually planned and implemented selectively and are based on carefully conducted cost-benefit analyses. An important role in the implementation of digital solutions is also played by the company's financial, time and human resources as well as the IT affinity of the persons entrusted with the management.

### *Key factor personnel*

The interviews show that the qualification of staff is generally regarded as a key factor for the successful implementation of digital solutions. Measures in the areas of education and training therefore enjoy a high priority at the company level. Despite this commitment, many companies face challenges in connection with digitalisation in the area of human resources. In particular, there is a risk of employees being overstrained by complex IT solutions. In addition, companies are affected to varying degrees by the shortage of skilled workers. The peripheral location of the canton of Valais and the geographical distance of important educational institutions prove to be aggravating factors in this regard.



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

### *A sufficient digital infrastructure*

The quality of the digital infrastructure is not an obstacle to the implementation of digital solutions for most of the companies surveyed. At the same time, it is emphasised that the requirements for transmission rates will continue to increase in the coming years.

### *The challenge of inter-company cooperation and innovation networks*

The companies use various channels to inform themselves about new technological possibilities and to use the corresponding potentials. In addition to contacts with suppliers, trade fairs, magazines, internet research and professional associations are important. The lack of an independent information and advice centre on IT solutions is regretted by individual company managers. The interviews also make it clear that inter-company cooperation for the development of digital solutions is not very pronounced, neither within the sector nor across sectors. According to the assessment of several interviewees, this has a negative impact on the innovation potential of the companies. Furthermore, the companies are hardly integrated into the networks of public innovation promotion and only use their instruments in individual cases. With regard to the further strengthening of the value chain and the use of new technological possibilities, the question arises as to how improvements can be achieved in these two areas.



## Annex

### List of interviews

#### *Forestry operations*

Olivier Bourdin, Cône de Thyon. Interview on 26.08.2020 in Sion.

Willy Werlen, Forest Goms. Conversation on 30.6.2020 in Reckingen.

#### *Sawmills*

Jean-Charles Astori, Astori Frères SA. 26.08.2020 in Sion.

Lionel Beney, BL Bois. 02.09.2020 in Icogne.

Bernard Zanella, Zanella Holz AG. 23.06.2020 in Turtmann.

#### *Joineries and carpentries, timber construction*

Pascal Abgottspon, Abgottspon Werlen Architekten. 25.08.2020 in Visp.

Marc Joris, Moulin menuiserie. 12.08.2020 in Vollèges.

Maxime Métrailler, Les Artisans du Bois. 10.08.2020 in Nendaz.

Fabian Nussbaumer, Nussbaumer. 30.06.2020 in Naters.

Johann O'Connell, A-Real Architectes. 02.09.2020 in Sierre.

Ulrich Weger, Holzbau Weger. 30.06.2020 in Münster.

#### *Associations*

Christina Giesch, Valais Forest. 24.08.2020 in Sion.

Thomas Lochmatter, Association of Swiss Master Carpenters and Furniture Makers, Upper Valais Section. 23.06.2020 in Visp.



## Appendix

### Standard interview questionnaire

#### 1. *Company portrait*

Number of employees

Product range

#### 2. *Wood value chain*

What is the importance of regional cooperation for the company?

What are the opportunities, what are the challenges?

#### 3. *Use of digital technologies*

To what extent does digitalisation play a role in the corporate strategy?

In which areas of the company's activities are digital solutions mainly used?

- Purchasing
- Production processes
- Logistics
- Sales/Marketing
- Management

Can the company's financial expenditure for digitisation projects be quantified (low - medium - high)?

How can the cost-benefit ratio of digitisation projects be assessed?

Are there further training opportunities for employees in the area of digitalisation?

#### 4. *Assessment of the potentials and challenges*

To what extent does digitalisation open up new opportunities for the company?

In which areas is there the greatest potential?

Are there fears or risks associated with digitalisation (e.g. new players, market displacement, etc.)?

What are the obstacles to the elaboration of a digitisation strategy and the implementation of the corresponding projects (e.g.: Lack of qualified staff, data protection, data security, financial outlay, performance of the internet connection, etc.)?

#### 5. *Support*

Does the company receive support for the implementation of digitisation projects (e.g.: public innovation funding, Swiss mountain aid, etc.)?

Is there an exchange on digitisation projects (e.g. : industry associations, partner companies)?



## Smart SMEs

Co-financed by the European Parliament through the  
Alpine Region Preparatory Action Fund (ARPAF)

Do you have contacts with companies from other sectors?

What form of support would be appropriate?

### 6. Outlook

What changes will digitalisation bring to the business in the next ten years?

Are there any other comments on the topic of the conversation?