Alpine Space Project AlpGov2

**How to strengthen the resilience of SMEs in the Alpine Space?
The role of digitalisation and clusters**

Interreg
Alpine Space
AlpGov

ESTÀ Economia e Sostenibilità

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INTRODUCTION AND METHODOLOGICAL NOTE

EUSALP

EUSALP, the European Strategy for the Alpine Space, is one of the four macro-regional strategies of the European Union. The strategy provides a political framework for the states and regions located along the Alpine strip to address and find joint solutions to challenges and to make the best use of common potential and opportunities.

The European strategy, under the approval of the European Council, is coordinated and monitored by the European Commission (DG Regions) and implemented through EU funds (Interreg Alpine Space Programme, Interact, ARPAF, ...).

The implementation of the action programme is carried out through the work of nine action groups (AGs), executive bodies, composed of experts from all participating countries and from public, private and voluntary organizations. Within the AGs, various subgroups work on specific topics and tasks.

The strategy covers seven countries, including five EU Member States (Austria, France, Germany, Italy and Slovenia) and two non-EU countries (Liechtenstein and Switzerland), with a total of 48 regions.

The EUSALP space in numbers
(2018, excluding Liechtenstein)

Area
498.441 km²

Population
82,5 millions

Population density
165,6 inhab/km²

*GVA of the manufacturing sector ***
21,7%

*Enterprises in the manufacturing sector ***
9,7%

*Manufacturing employment ***
17,7%

* (% of total activity)

EUSALP IS BASED ON THREE THEMATIC POLICY AREAS AND ONE TRANSVERSAL POLICY AREA

GOVERNANCE including institutional capacity

OBJECTIVE
A sound macro-regional governance model for
the Region to improve cooperation and the coordination of action

ECONOMIC GROWTH AND INNOVATION	MOBILITY AND CONNECTIVITY	ENVIRONMENT AND ENERGY
OBJECTIVE Fair access to job opportunities, building on the high competitiveness of the Region	**OBJECTIVE** Sustainable internal and external accessibility for all	**OBJECTIVE** A more inclusive environmental framework for all and renewable and reliable energy solutions for the future
PRIORITIES 1. Developing innovation and research capacity and transfer into practice 2. Improving and developing support for enterprises 3. Promoting high levels of employment, with the aim of ensuring full employment in the Region	**PRIORITIES** 1. Better overall transport system in terms of sustainability and quality 2. Improve sustainable accessibility for all Alpine Areas 3. A better connected society in the region	**PRIORITIES** 1. Reinforcing natural and cultural resources as assets of high quality living area 2. Building further on the position of the Alpine Region as world-class in terms of energy efficiency and sustainable production of renewable energy 3. Alpine risk management including risk dialogue, to tackle potential threats, such as those of climate change

▶ **AG1**
Lombardy Region -
University of Milan Unimont
Research & innovation

▶ **AG2**
Auvergne-Rhône-Alpes Region
& Piedmont Region
Economic development

▶ **AG3**
Autonomous Province
of Trento & Regional Agency
of Trentino Sviluppo
*Labour market, education
and training*

▶ **AG4**
European Region
Tyrol-South Tyrol-Trentino &
Provence-Alpes-Côte d'Azur
Region
Mobility

▶ **AG5**
Autonomous Region of
Valle d'Aosta &
Swiss Association
for Mountain Regions (SAB)
Connectivity & Accessibility

▶ **AG6**
Permanent Secretariat of the
Alpine Convention & Regional
Government of Carinthia
Natural resources

▶ **AG7**
Bavarian State Ministry of
the Environment and Consumer
Protection & Institute of the
Republic of Slovenia
for Nature Conservation
Ecological connectivity

▶ **AG8**
Austrian Federal Ministry of
Agriculture, Regions and Tourism
& Bavarian State Ministry
of the Environment
and Consumer Protection
Risk governance

▶ **AG9**
Agency for Energy South Tyrol - CasaClima
& Auvergne-Rhône-Alpes Energy
Environment Regional Agency
*Energy efficiency and
renewable energy*

This infographic has been adapted by
EStà from: https://www.alpine-region.eu/sites/default/
files/uploads/page/276/attachments/what_is_eusalp-info-
graphic.pdf

AlpGov2 project

The study is one of the preparatory actions for the implementation of strategic initiatives among those foreseen by the Interreg 2014-2020 Alpine Space project AlpGov2 - "Enhancing the Governance Mechanisms of the European Strategy for the Alpine Region", of which the Lombardy Region is the lead partner. The activity is in particular related to the transversal initiatives coordinated by EUSALP Action Group 2 "Increasing the economic potential of strategic sectors" Digital Industry Subgroup.

The Alpine Space programme is a European transnational cooperation programme for the Alpine region. It provides a framework to facilitate the cooperation between economic, social and environmental key players in the Alpine countries, as well as between various institutional levels such as: academia, administration, business and innovation sector, NGOs, associations and policy making.

The programme is financed through the European Regional Development Fund (ERDF) as well as through national public and private co-funding of the Partner States. In the current programming period, 2021-2027, the programme is investing €107 million in projects through which key actors develop shared solutions for prevalent Alpine issues.

There are two main lines of action used in the action programme to develop transnational solutions for transnational challenges of the Alpine region:
1. Fostering cooperation between the organizations that can tackle these challenges;
2. Co-financing cooperation projects to up to 75% via the European Regional Development Fund (ERDF).

There are four priorities in the Alpine Space Programme:
1. Climate resilient and green Alpine region
2. Carbon neutral and resource sensitive Alpine region
3. Innovation and digitalisation supporting a green Alpine region
4. Cooperatively managed and developed Alpine region

ALPINE SPACE Programme

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European transnational
cooperation programme for the
Alpine region

▼

FRAMEWORK
to facilitate cooperation
between **economic,
social and environmental
key players**

+

between various
institutional levels

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Priority 1
CLIMATE RESILIENT AND GREEN ALPINE REGION

Promoting climate change adaptation
and disaster risk prevention, and
resilience, taking into account
eco-system based approaches

Enhancing protection and preservation
of nature, biodiversity and green
infrastructure, including urban areas,
and reducing all forms of pollution

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Priority 2
CARBON NEUTRAL AND RESOURCE SENSITIVE ALPINE REGION

Promoting energy efficiency and
reducing greenhouse gas emissions

Promoting the transition to a circular and
resource efficient economy

AlpGov 2 is part of the actions for priority 4 of the Alpine Space Programme and involves all the AGs of EUSALP.
The project aims at strengthening governance structures and mechanisms within the Alpine Space to reinforce the Common Strategy and push it towards a more integrated perspective in the main regional development and cohesion policies. Thanks to the integrated approach involving all relevant actors and stakeholders in the project, AlpGov2 considers all the themes of the EUSALP action plan, ensuring a broad knowledge transfer between the different fields of action.

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Priority 3
INNOVATION AND DIGITALISATION SUPPORTING A GREEN ALPINE REGION

Developing and enhancing research and innovation capacities and the uptake of advanced technologies

Reaping the benefits of digitalisation for citizens, companies, research organisations and public authorities

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Priority 4
COOPERATIVELY MANAGED AND DEVELOPED ALPINE REGION

Enhance institutional capacity of public authorities and stakeholders to implement macro-regional strategies and sea-basin strategies, as well as other territorial strategies

Worktop

The study was carried out through the adoption of a mixed survey methodology: on the one hand, a detailed analysis at sectoral and regional level of the main macroeconomic and digitisation-related indicators, and on the other hand, a qualitative survey that collected the main indications related to the theme of resilience from some enterprises and the main stakeholders of the project.
The activities of the first phase of the project were cross-cutting. EStà collected and processed macroeconomic data (EuroStat sources, European Commission) in order to provide a mapping of the EUSALP regions by means of a set of simple and composite indicators allowing a comparative assessment of the picture and the dynamics of the geo-economic areas in general, and of the specific production sectors identified. In addition, we proposed a 'geographical update' in EUSALP of the European Commission's Resilience Dashboard: for this purpose, some indicators were selected from the thematic areas social and economic, green, digital and geopolitical.
Furthermore, the data and information collected through the stakeholder interviews provide specific and detailed insights into the existing system resources in EUSALP. The results of the SMART SMEs and CIRCULAR 4.0 projects, as well as some in-depth questions to stakeholders, were elaborated and integrated into the results of the project.
In the second phase of the project, EStà constructed a questionnaire to investigate vulnerabilities (causes and adaptation/overcoming tools) and practices in the area of digitalisation and circular economy for SMEs. The questionnaire was jointly validated internally and submitted to the various stakeholders who provided important suggestions for improvement. The questionnaire was then translated into the various languages of origin of the EUSALP regions (Italian, French, German, Slovenian, English) in order to facilitate its completion by enterprises. The results of the questionnaire make it possible to draw assessments that can be supplemented with analysis and mapping at macro level.

MIXED SURVEY METHODOLOGY

macroeconomic and digitisation -related indicators   *sector + regional level*

▼

comparative assessment of the picture and the dynamics of the geo-economic areas and of the specific production sectors identified

▼

'geographical update' in EUSALP of the European Commission's Resilien ce Dashboard -social and economic, green, digital and geopolitical-

▼

SMART SMEs and CIRCULAR 4.0 projects, as well as some in-depth questions to stakeholders provide specific and detailed insights into the existing system resources in EUSALP

qualitative survey on the theme of resilience   *enterprises + stakeholder of the project*

▼

questionnaire to investigate vulnerabilities and practices in the area of digitalisation and circular economy for SMEs

▼

the results make it possible to draw assessments

▼

interviews woth stakeholders from the EUSALP world to gather information about the functioning of the relationship system within EUSALP, its potential and critical areas

In the next phase of the project, EStà interviewed stakeholders from the EUSALP world, in line with the multi-sectoral and multi-governance nature of the AlpGov2 project: this action was of fundamental importance to access the activities carried out by the various AGs of the project. At this stage, EStà gathered information about the functioning of the relationship system within EUSALP, its potential and critical areas. In general, clusters and technological innovation centres (university or trade association) are given considerable weight. The interviewees, unable to indicate company addresses directly, provided contacts of clusters or networks of enterprises working more closely with SMEs in the territory. The latter were contacted, interviewed and integrated into the process of dissemination and administration of the questionnaire. The record of the interviews constitutes a central part of the report.

The questionnaire, administered via the "Google Forms" tool, was addressed via clusters to companies in: Italy, Switzerland, Austria, Germany, Slovenia and France.

The thematic areas of the interviews and the structure of the questionnaire for companies will be discussed together with the results in the following chapters.

As a final step, following the replies to the questionnaire, some companies were contacted and interviewed in order to further investigate some central elements resulting from the answers sent. In this sense, the dialogue with entrepreneurs allowed us to collect and systematise some good practices adopted at an organisational level to respond to the pandemic crisis and the innovative tools used in the area of digitalisation and the circular economy.

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Methodological note and reading guide

The macro-mapping of the economic and social system of the Alpine Space that follows in the next pages has been constructed according to a thorough methodology. The reading of the indicators allows the identification of vulnerabilities and potentials affecting economic activities operating in the Alpine Space, at a comparative level between territories and between economic activities. Furthermore, in this work the theme of digitalisation is deepened through the territorial reading of the Regional Innovation Index (RII). The choice of this indicator comes from a careful analysis of the results of the Alpine Region Preparatory Action Fund (ARPAF) project "SMART SMEs". Among the indicators presented in the project to measure the level of digital maturity of SMEs in natural fibre-based value chains, the RIS (Regional Innovation Scoreboard) was chosen for two main reasons: the in-depth level of detail with respect to Alpine Space regions and the effectiveness of the scoreboard in synthesising multiple indicators. In addition, the vulnerability matrix presents a synthesis of two indicators relating to employment dynamics and enterprise size in order to propose an assessment of the elasticity of manufacturing sectors in responding to change.

The second section of the report investigates the concept of resilience for small and medium-sized enterprises by means of two tools: on the one hand, a brief analysis of the available literature with an in-depth look at the concept of "organisational resilience" and, on the other hand, through the application at regional level of the Resilience Dashboard developed by the European Commission.

Finally, this paper will present the main indications proposed by the interviewed stakeholders and the results of the questionnaires to SMEs in some

INDICATORS
▼
identification of vulnerabilities and potentials affecting economic activities operating in the Alpine Space

▼   ▼
between   between
territories   economic
                     activities

THEME OF INNOVATION
▼
territorial reading of the Regional Innovation Index for
the in-depth level of detail with respect to Alpine Space regions and the effectiveness of the scoreboard in synthesising multiple indicators

VULNERABILITY MATRIX
▼
synthesis of two indicators relating to employment dynamics and enterprise size in order to propose an assessment of the elasticity of manufacturing sectors in responding to change

regions: in this case, the theme of resilience and the role of clusters in strengthening the entrepreneurial fabric of the Alpine Space, in view of circular economy and innovation, are the central points of the study. In addition, interviews with some of the entrepreneurs who responded to the questionnaire allow us to delve into five topics that are of strong interest in strengthening resilience.

For the construction of the set of socio-economic indicators, data from the Eurostat SBS (Structural Business Statistics) survey were used. The manufacturing sectors considered are:

NACE REV2 NAME	NACE REV2 CODE
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting mate rials	C16
Manufacture of chemicals and chemical products	C20
Manufacture of rubber and plastic products	C22
Manufacture of basic metals, manufacture of fabricated metal products, except machinery and equipment, manufacture of computer, electronic and optical products, manufacture of electrical equipment, manufacture of machinery and equipment n.e.c., manufacture of motor vehicles, trailers and semi-trailers, manufacture of other transport equipment, repair and installation of machinery and equipment	C24-30, C33

The four SBS variables considered on a regional and sectoral scale are: local units, labour costs, persons employed, employment growth rate. For the gross value added data, spatially disaggregated data on total manufacturing activities were used. For the population data, the number of persons having their usual residence in a given area on 1 January was

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chosen. The analyses carried out in the following paragraphs refer to the pre-pandemic economic and social situation: it has been decided not to integrate the surveys of the year 2020 in order to purify the observation of the distorting effect that the crisis produced by the Covid 19 pandemic had on economic, employment and statistical variables in general. The last year taken into consideration is therefore 2018 because for many NUTS2 regions, data for 2019 is not available. As mentioned above, the socio-economic indicators produced for the mapping of the EUSALP area were developed for each territorial unit of the NUTS2 classification. In particular, the regions of the entire Alpine Space were chosen, which in many cases correspond to the entire territory of a country (Austria, Slovenia and Switzerland). For Switzerland, the figure used is aggregated at national level as there is no regional breakdown in EUROSTAT. The indicators using the amount of value added produced (indicators 5 and 6) have been constructed by referring to a different calculation method for value added at regional and national level: for the former, which covers all manufacturing activities as a whole, value added is calculated at basic prices, for the latter, i.e. for the different production sectors, value added is calculated at factor costs. It was necessary to refer to values with different calculation methods in order to propose an analysis of the dynamics of added value at regional and sectoral disaggregated levels.

The socio-economic indicators are presented in groups of two indicators in order to juxtapose assessments using similar reference data. The group of the first two indicators presents the map of the population of the EUSALP area, because in both indicators reference is made to this data. Subsequently, a snapshot of the situation as of 2018 for each indicator was developed (map and graphical representation). This is followed by two infographics describing the value of the indicator for each of the three years considered and the variation of the figure over the period 2011-2018. The second group of indicators initially presents the map of the distribution of employed people in the Alpine Space regions. In particular, for indicator four, the representation changes: the map and the infographic show the change in the number of employed people during the period under consideration. The third group of indicators presents

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the map of the area showing the distribution of the added value of the manufacturing industry and the following infographics focus on the regional and national level on the evolution of the indicators in the different manufacturing sectors.The data on value added, labour costs and employment at national and sectoral level of indicators five and six refer to the total of the regions in each country and not only to the regions within the EUSALP area.

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SOCIO-ECONOMIC INDICATORS OF THE ALPINE SPACE

INDICATOR 1

Numerator: number of local units
Denominator: resident population
Unit of measurement: local units per 10,000 inhabitants

INDICATOR 2

Numerator: number of employees
Denominator: resident population
Unit of measurement: employment units per 10,000 inhabitants

Indicator 1 and indicator 2 allow us to understand how the different economic activities that are the object of our analysis are distributed over the Alpine Space territory.

The density of economic units (Ind1) thus refers to the number of local units of enterprises per 10,000 inhabitants. In particular, indicator 1 represents in a synthetic way the result of the ratio between the number of local units for each manufacturing sector and the number of the resident population on 1 January of each year in each region. In order to obtain a measure of density, it was decided to use the measure of resident population and not the measure of total regional surface area for two reasons in particular: firstly, to try to overcome the difficulties linked to the heterogeneity in terms of surface area of the NUTS2 regions and secondly, to represent the relationship existing in the territory between enterprises and inhabitants, and therefore between economic activity and territory. This element is central to the overall approach of the study and represents one of the main indications that were provided by the various stakeholders interviewed in the previous months, expert connoisseurs of EUSALP dynamics: the Alpine territory not only structures the value chains in EUSALP, but the dissemination of good practices of digitalisation and circular economy, passing through small and medium-sized enterprises in the various regions, potentially exploits the existing interregional connections between clusters, between information and training centres, between business networks, and more generally between people.

The second indicator proposed reproduces the method and aims used for indicator 1. This indicator analyses the ratio of those employed in a given sector to the population of each region. The aim is, therefore, to observe how and with what intensity the inhabitants of a specific territory participate in the labour market and thus in the structuring of the various value chains. Employment density is an indicator of the absolute productive specialisation of each area.

EUSALP AREA POPULATION
2018

Stuttgart 4.126.688
Tübingen 1.846.280
Karlsruhe 2.795.783
Freiburg 2.254.674
Franche-Comté 1.179.070
Bourgogne 1.628.737
Schwaben 1.873.368
Auvergne 1.368.536
Switzerland 8.484.130
Valle d'Aosta 126.202
Rhône-Alpes 6.625.923
Provence-Alpes-Côte d'Azur 5.052.832
Piemonte 4.375.865

Oberfranken 1.066.840
Oberpfalz 1.104.407
Niederbayern 1.230.037
Oberbayern 4.649.534
Mittelfranken 1.759.643
Wien 1.888.776
Niederösterreich 1.670.668
Oberösterreich 1.473.576
Burgenland 292.675
Salzburg 552.579
Kärnten 560.898
Bolzano 527.750
Zahodna Slovenija 977.163
Vzhodna Slovenija 1.089.717
Friuli-Venezia Giulia 1.215.538
Veneto 4.905.037
Trento 539.898
Tirol 751.140
Lombardia 10.036.258
Vorarlberg 391.741
Liguria 1.556.981

Map labels: Unterfranken, Oberfranken, Oberpfalz, Mittelfranken, Karlsruhe, Stuttgart, Niederbayern, Niederösterreich, Wien, Freiburg, Tübingen, Schwaben, Oberbayern, Oberösterreich, Burgenland, Bourgogne, Franche-Comté, Schweiz/Suisse/Svizzera, Vorarlberg, Tirol, Salzburg, Steiermark, Kärnten, Provincia Autonoma di Bolzano/Bozen, Auvergne, Valle d'Aosta/Vallée d'Aoste, Rhône-Alpes, Provincia Autonoma di Trento, Friuli-Venezia Giulia, Vzhodna Slovenija, Zahodna Slovenija, Piemonte, Lombardia, Veneto, Liguria

20   21

in developing this type of industry and, as we will see later, exploit the potential of their positioning in other value chains.

CHEMISTRY

How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

With regard to the chemical sector, the highest density of companies in 2018, at country level, is in the Italian regions: in particular, in Lombardy there are on average almost two companies in the chemical sector for every 10,000 inhabitants (down from 2011). The single region where there is the highest concentration of industries in the sector is Provence-Alpes-Côte d'Azur, with more than two enterprises per 10,000 inhabitants. With more than one enterprise per 10 thousand inhabitants, the regions of Zahodna Slovenija (1.57 enterprises), Veneto (1.27 enterprises), Oberbayern (1.09 enterprises), Piedmont (1.06 enterprises) and Rhône Alpes (1.05 enterprises) follow.

On the contrary, the regions where the presence of local units involved in the manufacturing of chemical products is lowest are those of the central Alpine belt: the lowest values are those of the Swiss belt (0.5 units), Franche Comté (0.47 units), Burgenland (0.44 units), Valle d'Aosta (0.32 units) and Oberpfalz (0.32 units). Regions that are close to the Alpine belt and characterized by a high coverage of mountainous territory have difficulties

REGIONAL BUSINESS DENSITY
2011 - 2015 - 2018

As a matter of graphical representation, some sizes exceed the page border.
In this case, please refer to the value of the indicator written inside.

2011 | 2015 | 2018

Region	2011	2015	2018
Stuttgart	0.81	0.72	0.70
Karlsruhe	1.14	1.04	0.92
Freiburg	0.74	0.71	0.70
Tübingen	0.71	0.57	0.51
Oberbayern	1.26	1.16	1.09
Niederbayern	0.68	0.66	0.54
Oberpfalz	0.33	0.39	0.32
Oberfranken	0.69	0.72	0.68
Mittelfranken	0.71	0.70	0.63
Unterfranken	0.87	0.78	0.88
Schwaben	1.21	0.98	0.94
Bourgogne	0.60	0.62	0.71
Franche-Comté	0.33	0.35	0.47
Auvergne	0.57	0.57	0.71
Rhône-Alpes	0.78	0.82	1.05
Provence-Alpes-Côte d'Azur	1.38	1.42	2.03
Piemonte	1.06	0.80	1.06
Valle d'Aosta	0.39	0.32	
Liguria	1.11	0.83	
Lombardia	1.95	1.34	1.78
Provincia Autonoma di Bolzano	0.46	0.50	0.64
Provincia Autonoma di Trento	0.73	0.58	0.56
Veneto	1.24	0.92	1.27
Friuli-Venezia Giulia	0.70	0.64	0.78
Burgenland	0.39	0.59	0.44
Niederösterreich	0.71	0.85	0.85
Wien	0.46	0.52	0.51
Kärnten	0.56	0.68	0.66
Steiermark	0.51	0.56	0.64
Oberösterreich	0.63	0.67	0.62
Salzburg	0.74	0.72	0.78
Tirol	0.59	0.71	0.81
Vorarlberg	0.73	0.69	0.74
Vzhodna Slovenija	0.76	0.82	
Zahodna Slovenija	1.25	1.57	
Switzerland	0.56	0.53	0.50

CHANGE
2011-2018

Important changes in the Alpine business fabric can be observed between 2011 and 2018. The French regions show a very positive performance with a continuous expansion of the chemical manufacturing sector: in Provence-Alpes-Côte d'Azur, companies increased by +47.5% and in Franche-Comté by +40.4%. The Autonomous Province of Bolzano followed with a percentage change of over 40% (+40.6%). In the same period, there is also a contraction of enterprises operating in the sector in some regions: about 25% fewer enterprises in the Tübingen (-28.3%) and Liguria (-25.5%) regions. On average in the EUSALP area the sector shows an expansion in the number of enterprises (+3.9%).

Provence-Alpes-Côte d'Azur
Provincia Autonoma di Bolzano
Franche-Comté
FRANCE (EUSALP)
Tirol
Rhône-Alpes
Zahodna Slovenija
Auvergne
Steiermark
Niederösterreich
Kärnten
SLOVENIA
Bourgogne
Burgenland
AUSTRIA
Wien
Friuli-Venezia Giulia
Vzhodna Slovenija
Salzburg
Veneto
Unterfranken
Vorarlberg
Piemonte
Oberfranken
Oberösterreich
Oberpfalz
ITALY (EUSALP)
Freiburg
Lombardia
Mittelfranken
SWITZERLAND
Stuttgart
Oberbayern
GERMANY (EUSALP)
Karlsruhe
Valle d'Aosta
Niederbayern
Schwaben
Provincia Autonoma di Trento
Liguria
Tübingen

-30 | -20 | -10 | 0 | 10 | 20 | 30 | 40 | 50

Oberfranken
Unterfranken
Oberpfalz
Mittelfranken
Stuttgart
Karlsruhe
Niederbayern
Niederösterreich
Wien
Freiburg
Tübingen
Schwaben
Oberbayern
Oberösterreich
Burgenland
Bourgogne
Franche-Comté
Vorarlberg
Tirol
Salzburg
Steiermark
Schweiz/Suisse/Svizzera
Tirol
Kärnten
Auvergne
Bolzano
Vzhodna Slovenija
Rhône-Alpes
Valle d'Aosta
Trento
Friuli-Venezia Giulia
Lombardia
Veneto
Piemonte
Liguria
Provence-Alpes-Côte d'Azur

WOOD

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How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

In 2018, there is a strong presence of wood industries in Slovenia (more than 10 units per 10,000 inhabitants): mainly in the Vzhodna Slovenija region (11.6 units). This is followed by Italy (5.4 units), with a central role for Valle d'Aosta (13.4 units) and the autonomous provinces of Bolzano and Trento (14.9 and 11.8 units respectively), and Austria (3.3 units), mainly in the regions of Salzburg (5.5 units), Kärnten (5.1 units) and Tyrol (5.4 units).
As can be seen from the graph below, wood manufacturing enterprises in the three countries of the southern and eastern EUSALP area together with Switzerland account for more than 80% of the total Alpine area.
On average in the EUSALP area there are 3.3 companies involved in wood production: the German Alpine (0.7 units) area and the French regions are far below the EUSALP data with an average of 2.8 units per 10,000 inhabitants.
On the whole, wood production is concentrated in areas with an important manufacturing tradition, which is certainly also linked to the management of the land and the forest ecosystem. Wood manufacturing is therefore

a manufacturing industry with a supply chain closely linked to the characteristics of the territory in which the companies are located.

GERMANY - EUSALP

Oberbayern 0.46
Stuttgart 0.57
Nieder-bayern 1.15
Ober-pfalz 0.83
Karlsruhe 0.58
Freiburg 0.97
Ober-franken 0.87
Unter-fran-ken 1.18
Sch-wab-en 1.01
Tübingen 1
Mittel-franken 0.56

FRANCE - EUSALP

Provence-Alpes-Côte d'Azur 1.75
Bourgogne 3.43
Auvergne 3.81
Franche-Comté 5.56
Rhône-Alpes 2.67

ITALY - EUSALP

Piemonte 4.96
Valle d'Aosta 13.39
Liguria 3.25
Lombardia 4.23
Trento 11.78
Bolzano 14.84
Veneto 6.63
Friuli-Venezia Giulia 6.81

AUSTRIA

Burgen-land 2.29
Niederöster-reich 3.01
Kärnten 5.05
Wien 0.73
Steiermark 3.48
Oberöster-reich 4.21
Salzburg 5.5
Tirol 5.37
Vorarlberg 4.9

SLOVENIA

Vzhodna Slovenija 11.64
Zahodna Slovenija 8.7

SWITZER

Switzer-land 3.5

REGIONAL BUSINESS DENSITY 2011 - 2015 - 2018

As a matter of graphical representation, some sizes exceed the page border. In this case, please refer to the value of the indicator written inside.
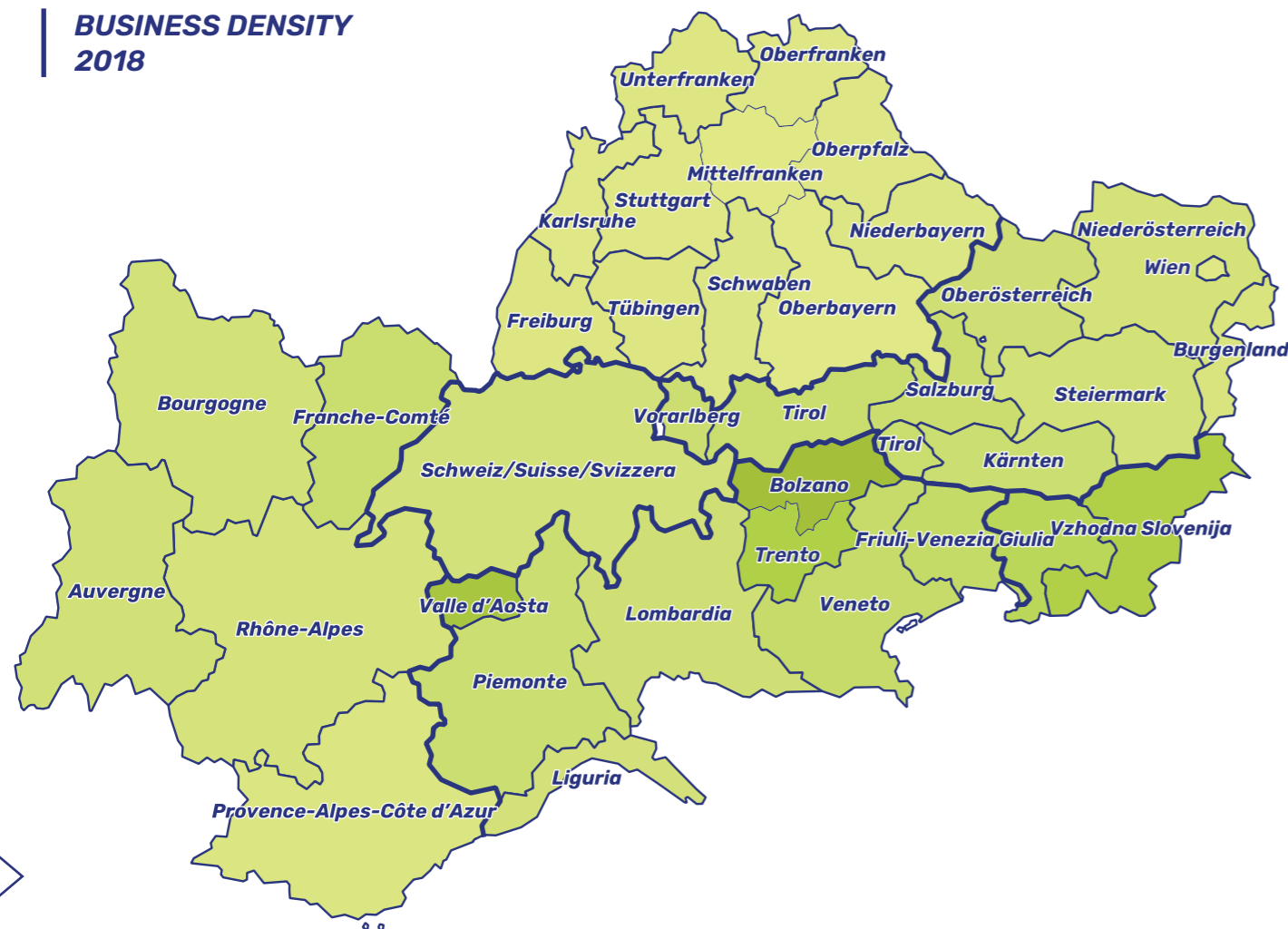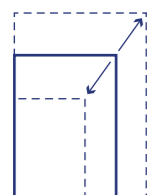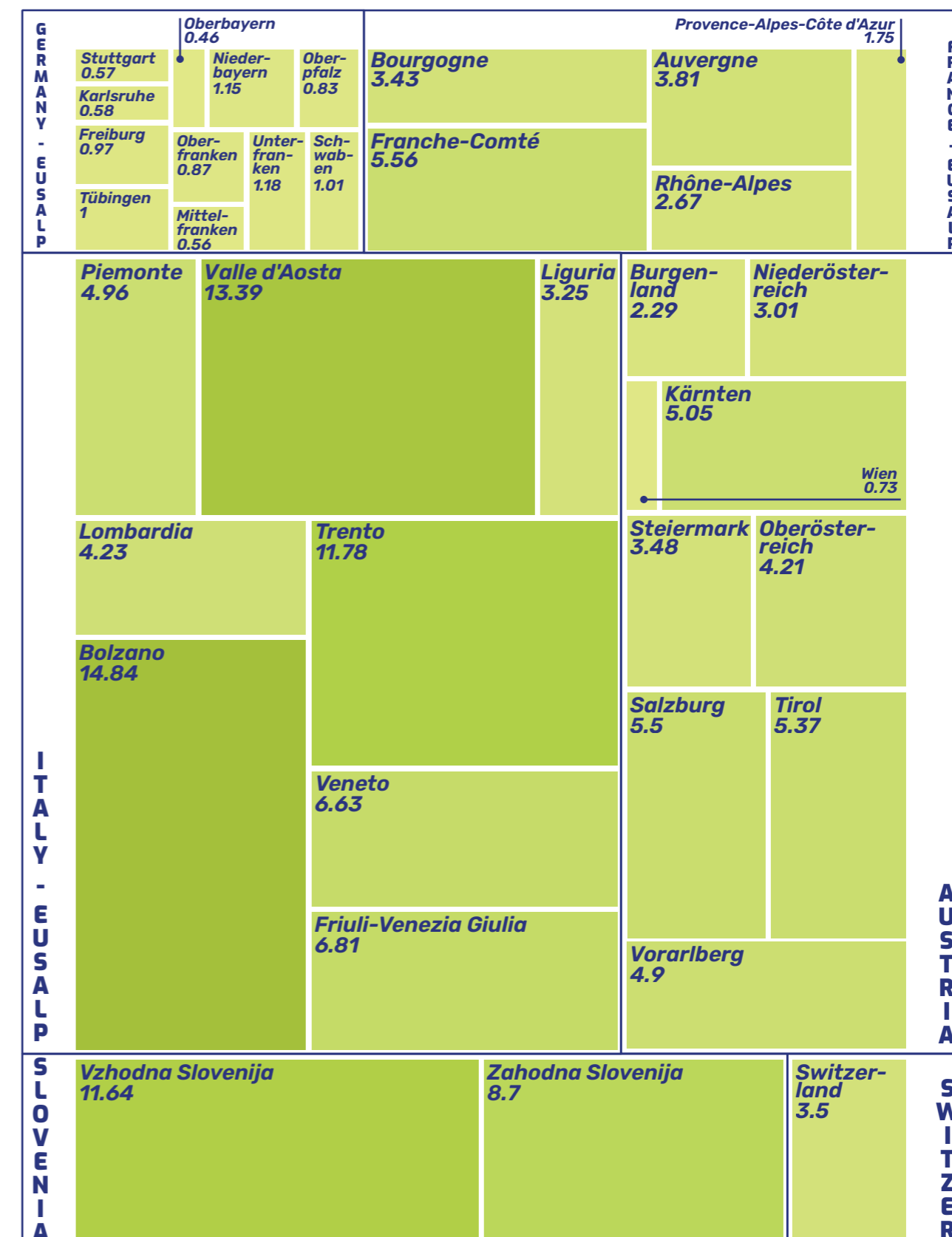
2011 2015 2018

Region	2011	2015	2018
Stuttgart	0.77	0.65	0.57
Karlsruhe	0.80	0.69	0.58
Freiburg	1.41	1.11	0.97
Tübingen	1.24	1.10	1.00
Oberbayern	0.56	0.47	0.46
Niederbayern	1.59	1.40	1.15
Oberpfalz	0.98	0.90	0.83
Oberfranken	1.02	0.80	0.87
Mittelfranken	0.56	0.57	0.56
Unterfranken	1.89	1.39	1.18
Schwaben	1.29	1.11	1.01
Bourgogne	2.94	3.02	3.43
Franche-Comté	5.06	5.41	5.56
Auvergne	3.73	3.73	3.81
Rhône-Alpes	2.30	2.60	2.67
Provence-Alpes-Côte d'Azur	1.35	1.52	1.75
Piemonte	6.89	5.16	4.96
Valle d'Aosta	17.67	14.73	13.39
Liguria	4.74	3.42	3.25
Lombardia	5.84	4.55	4.23
Provincia Autonoma di Bolzano	23.53	13.77	14.84
Provincia Autonoma di Trento	13.44	11.28	11.78
Veneto	8.68	7.12	6.63
Friuli-Venezia Giulia	8.08	7.19	6.81
Burgenland	3.09	2.88	2.29
Niederösterreich	3.27	3.22	3.01
Wien	0.82	0.87	0.73
Kärnten	5.26	5.34	5.05
Steiermark	3.80	3.90	3.48
Oberösterreich	4.50	4.49	4.21
Salzburg	5.49	5.46	5.50
Tirol	5.63	5.60	5.37
Vorarlberg	5.14	5.47	4.90
Vzhodna Slovenija	10.91	11.64	
Zahodna Slovenija	8.46	8.70	
Switzerland	4.05	3.79	3.50

WOOD

CHANGE 2011-2018

The graph illustrates an overall downsizing of the wood manufacturing sector: on average in the EUSALP area, companies in the sector decreased by -10.7% over the period 2011-2018. Only seven regions show positive rates of change: these are the French regions (which on average grow by +15.1%) and the Slovenian regions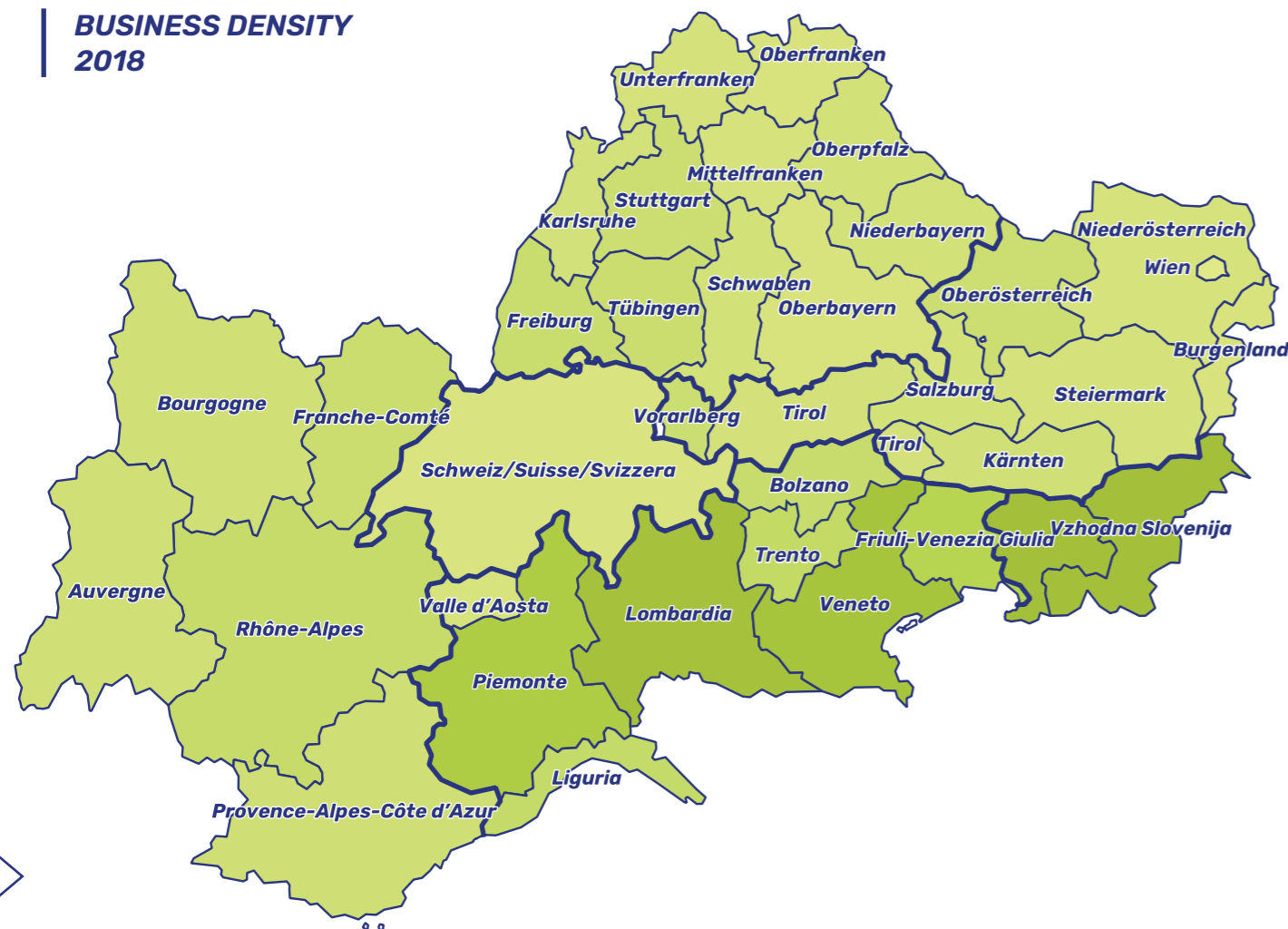 (which on average grow by +5.0%). Despite the fact that the Province of Bolzano still plays an important role in the structuring of the value chain of the wood industry, there has been a significant reduction in the number of active units over the period considered. In fact, the Province of Bolzano, together with the region of Unterfranken, shows a decrease rate of more than 30% (-37.0% and -37.5% respectively).

Provence-Alpes-Côte d'Azur
Bourgogne
Rhône-Alpes
FRANCE (EUSALP)
Franche-Comté
Vzhodna Slovenija
SLOVENIA
Zahodna Slovenija
Auvergne
Salzburg
Mittelfranken
Kärnten
Tirol
Vorarlberg
Oberösterreich
AUSTRIA
Niederösterreich
Steiermark
Wien
Provincia Autonoma di Trento
SWITZERLAND
Oberfranken
Oberpfalz
Friuli-Venezia Giulia
Oberbayern
Tübingen
Schwaben
Veneto
Valle d'Aosta
GERMANY (EUSALP)
Burgenland (AT)
ITALY (EUSALP)
Stuttgart
Karlsruhe
Niederbayern
Lombardia
Piemonte
Freiburg
Liguria
Provincia Autonoma di Bolzano
Unterfranken

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
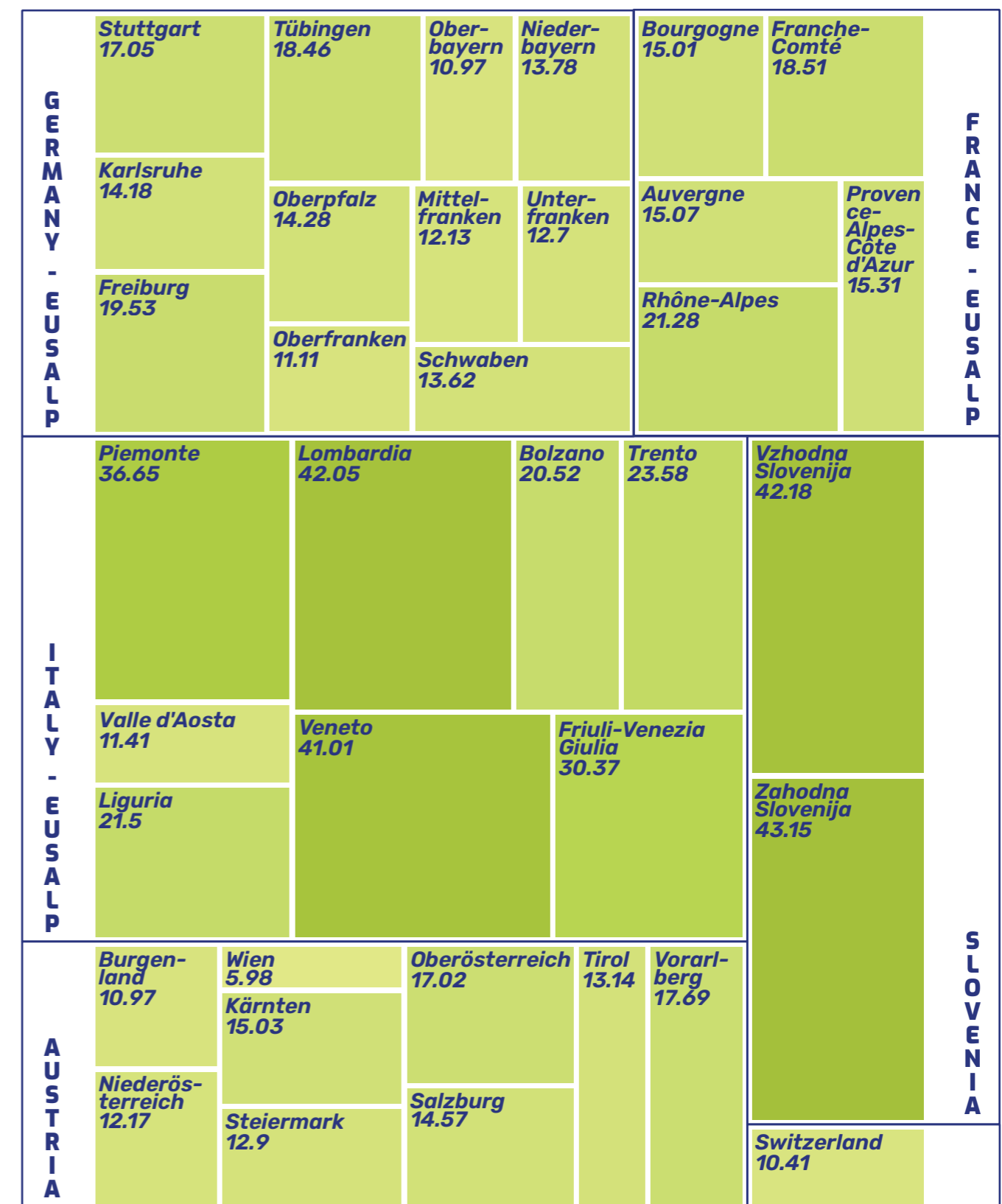
WOOD

MECHANICS AND MECHATRO-NICS

▲▲▲▲▲▲▲▲▲

How to read these data visualizations

Please, look at the previous sector.

The regions with the highest density of companies in the mechanical-mechatronics sector in 2018 are Slovenia and Italy, the only ones with values higher than the EUSALP average.

Among the Slovenian regions, Zahodna Slovenija has a higher density than the country's average (43.2 units), while among the Italian regions, Lombardy has the highest density of companies operating in the sector (42.1 units). The pool of companies operating in the sector is much larger than in the other manufacturing sectors covered by our study: in 2018, on average in the EUSALP area for every 10,000 inhabitants resident in the various regions, there were 21.8 production units involved in the mechanical sector. These values are significantly higher than the average of the other sectors analyzed (1.1 units for chemistry, 3.3 for wood and 2.0 for plastics).

In order, France, Germany, Austria and Switzerland show values below and increasingly far from the EUSALP average.

The density of the number of production units should also be read bearing in mind that a higher value of the indicator
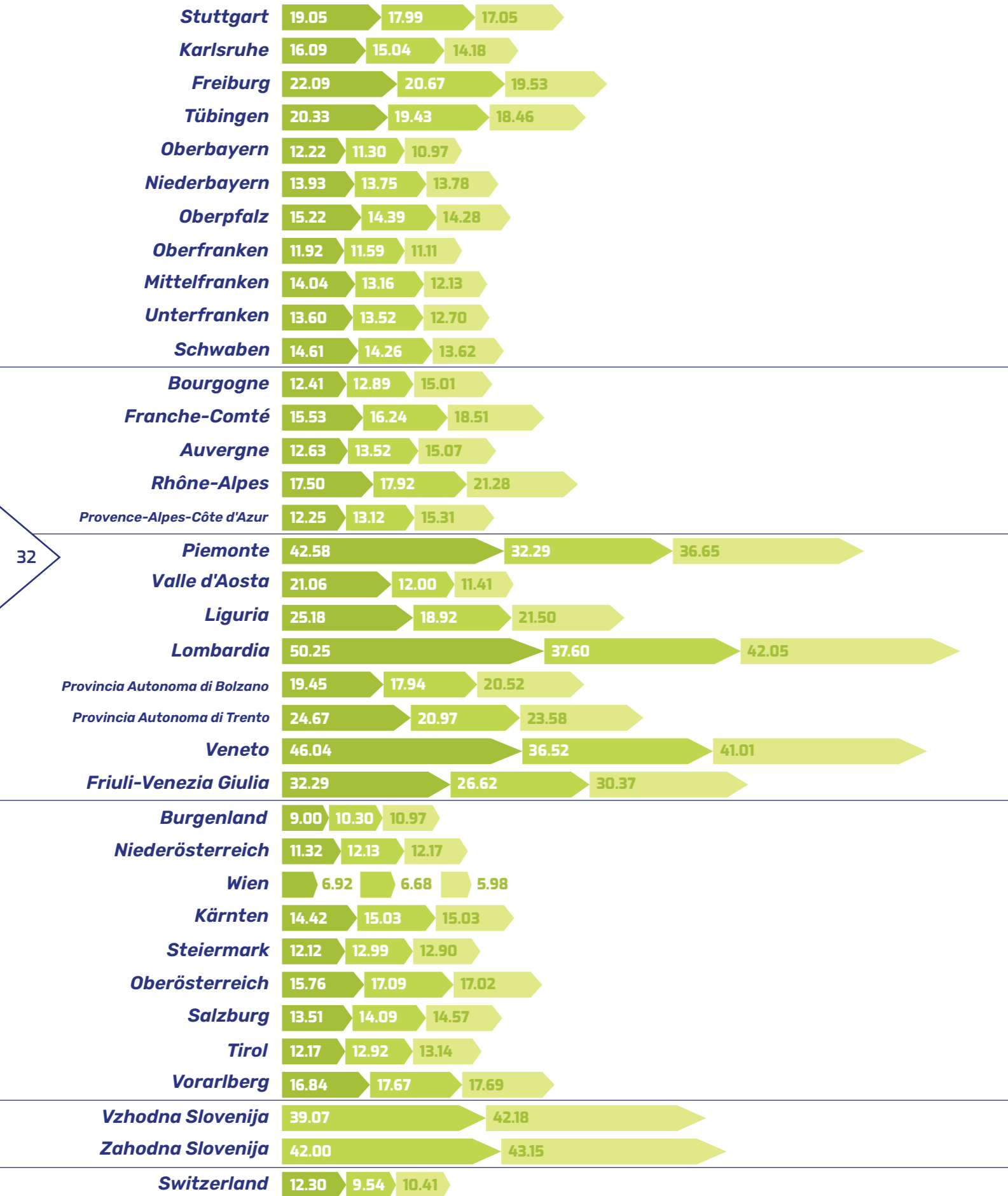
could be synonymous with a greater fragmentation of production processes and therefore with the presence of smaller enterprises. The following indicators provide a more complete picture of the situation.

GERMANY - EUSALP

Region	Value
Stuttgart	17.05
Tübingen	18.46
Ober-bayern	10.97
Nieder-bayern	13.78
Karlsruhe	14.18
Oberpfalz	14.28
Mittel-franken	12.13
Unter-franken	12.7
Freiburg	19.53
Oberfranken	11.11
Schwaben	13.62

FRANCE - EUSALP

Region	Value
Bourgogne	15.01
Franche-Comté	18.51
Auvergne	15.07
Provence-Alpes-Côte d'Azur	15.31
Rhône-Alpes	21.28

ITALY - EUSALP

Region	Value
Piemonte	36.65
Lombardia	42.05
Bolzano	20.52
Trento	23.58
Valle d'Aosta	11.41
Veneto	41.01
Friuli-Venezia Giulia	30.37
Liguria	21.5

AUSTRIA

Region	Value
Burgen-land	10.97
Wien	5.98
Kärnten	15.03
Oberösterreich	17.02
Tirol	13.14
Vorarl-berg	17.69
Niederös-terreich	12.17
Steiermark	12.9
Salzburg	14.57

SLOVENIA

Region	Value
Vzhodna Slovenija	42.18
Zahodna Slovenija	43.15
Switzerland	10.41

REGIONAL BUSINESS DENSITY 2011 - 2015 - 2018

2011 2015 2018

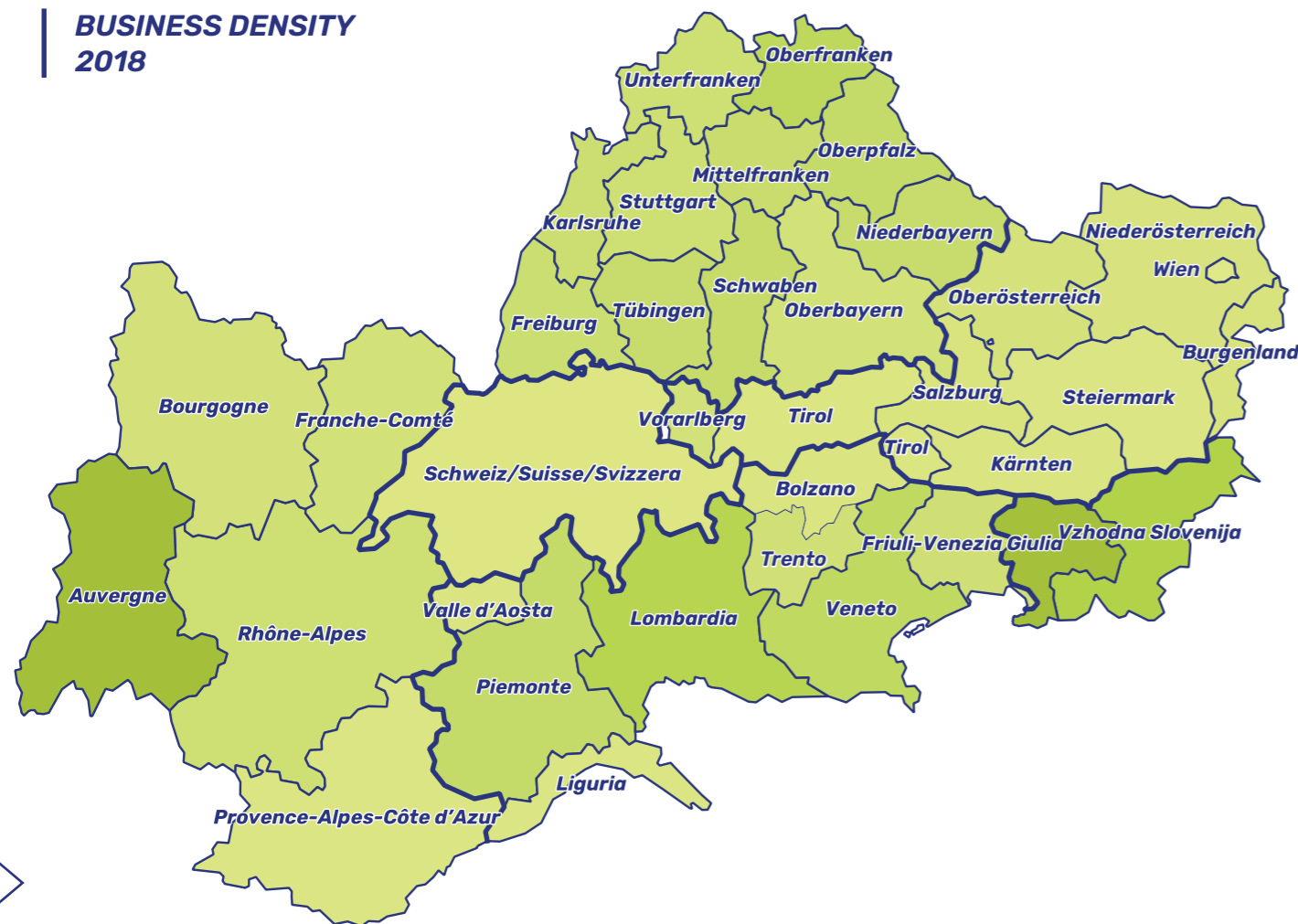| Region	2011	2015	2018
Stuttgart	19.05	17.99	17.05
Karlsruhe	16.09	15.04	14.18
Freiburg	22.09	20.67	19.53
Tübingen	20.33	19.43	18.46
Oberbayern	12.22	11.30	10.97
Niederbayern	13.93	13.75	13.78
Oberpfalz	15.22	14.39	14.28
Oberfranken	11.92	11.59	11.11
Mittelfranken	14.04	13.16	12.13
Unterfranken	13.60	13.52	12.70
Schwaben	14.61	14.26	13.62
Bourgogne	12.41	12.89	15.01
Franche-Comté	15.53	16.24	18.51
Auvergne	12.63	13.52	15.07
Rhône-Alpes	17.50	17.92	21.28
Provence-Alpes–Côte d'Azur	12.25	13.12	15.31
Piemonte	42.58	32.29	36.65
Valle d'Aosta	21.06	12.00	11.41
Liguria	25.18	18.92	21.50
Lombardia	50.25	37.60	42.05
Provincia Autonoma di Bolzano	19.45	17.94	20.52
Provincia Autonoma di Trento	24.67	20.97	23.58
Veneto	46.04	36.52	41.01
Friuli-Venezia Giulia	32.29	26.62	30.37
Burgenland	9.00	10.30	10.97
Niederösterreich	11.32	12.13	12.17
Wien	6.92	6.68	5.98
Kärnten	14.42	15.03	15.03
Steiermark	12.12	12.99	12.90
Oberösterreich	15.76	17.09	17.02
Salzburg	13.51	14.09	14.57
Tirol	12.17	12.92	13.14
Vorarlberg	16.84	17.67	17.69
Vzhodna Slovenija	39.07		42.18
Zahodna Slovenija	42.00		43.15
Switzerland	12.30	9.54	10.41

MECHANICS

CHANGE 2011-2018

Businesses in the sector showed a certain stability over the period, with both positive and negative rates of change peaking at around 20%. In the average of the EUSALP regions, production units in the sector decreased by -3.3%. In Slovenia, enterprises are growing by two per 10,000 inhabitants and in France by as much as three. Below the average macro-regional level are the regions of Germany (with the exception of Niederbayern, which decreases by -1.1%), Italy (with the exception of Bolzano, which sees its density increase by 5.5%) and Switzerland. In particular, over the period 2011-2018, the density of mechanical engineering production units in Lombardy decreased by -16.3%.
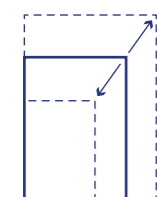
Provence-Alpes–Côte d'Azur
Provincia Autonoma di Bolzano
Franche-Comté
FRANCE (EUSALP)
Tirol
Rhône-Alpes
Zahodna Slovenija
Auvergne
Steiermark
Niederösterreich
Kärnten
SLOVENIA
Bourgogne
Burgenland
AUSTRIA
Wien
Friuli-Venezia Giulia
Vzhodna Slovenija
Salzburg
Veneto
Unterfranken
Vorarlberg
Piemonte
Oberfranken
Oberösterreich
Oberpfalz
ITALY (EUSALP)
Freiburg
Lombardia
Mittelfranken
SWITZERLAND
Stuttgart
Oberbayern
GERMANY (EUSALP)
Karlsruhe
Valle d'Aosta
Niederbayern
Schwaben
Provincia Autonoma di Trento
Liguria
Tübingen

-30 -20 -10 0 10 20 30 40 50

MECHANICS

34

35

PLACTIC

▲▲▲▲▲▲▲

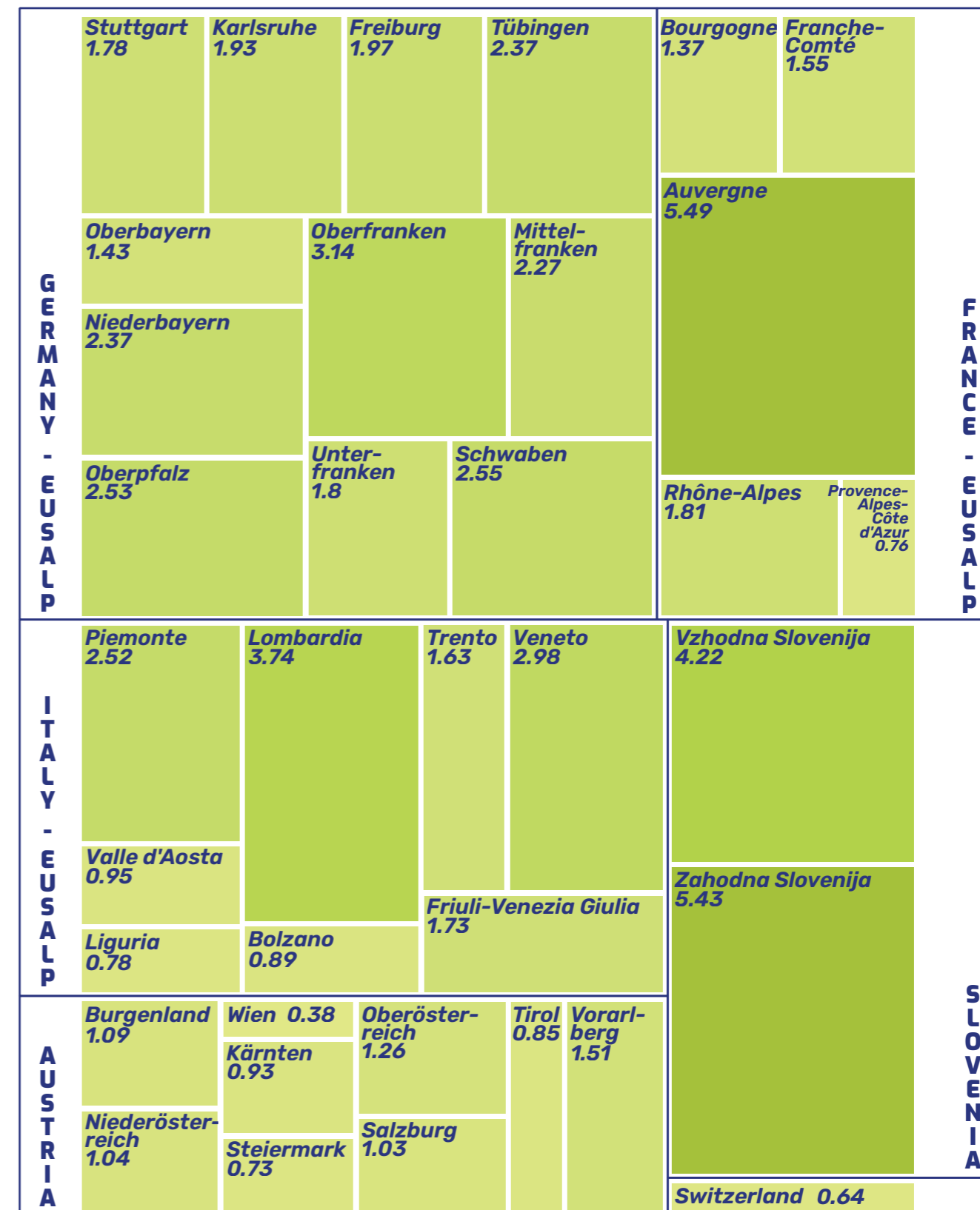**How to read these data visualizations**

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

In the EUSALP area there are 2 local units per 10,000 inhabitants dealing with plastics and plastic materials production, but the distribution is very heterogeneous in the different regions. For example, in Slovenia there are twice as many local units as the Alpine Space average, while in Switzerland there are about a quarter. In 2018, only five regions in the entire Alpine region had a density of enterprises in the sector of more than 3 units per 10,000 inhabitants: in the lead is the Auvergne region with 5.5 units, followed by Zahodna Slovenija (5.4 units), Vzhodna Slovenija (4.2 units), Lombardy (3.7 units) and Oberfranken (3.1 units).

The density of enterprises is lower and far from the Alpine Space average in the Swiss regions (0.6 units) and in the Vienna region (0.4 units). No Austrian region presents a density higher than the EUSALP average, while as far as French regions are concerned, only the Auvergne region presents a density higher than the average of the Alpine area. This suggests a strong specialization of the region in the production of plastics and plastic products.
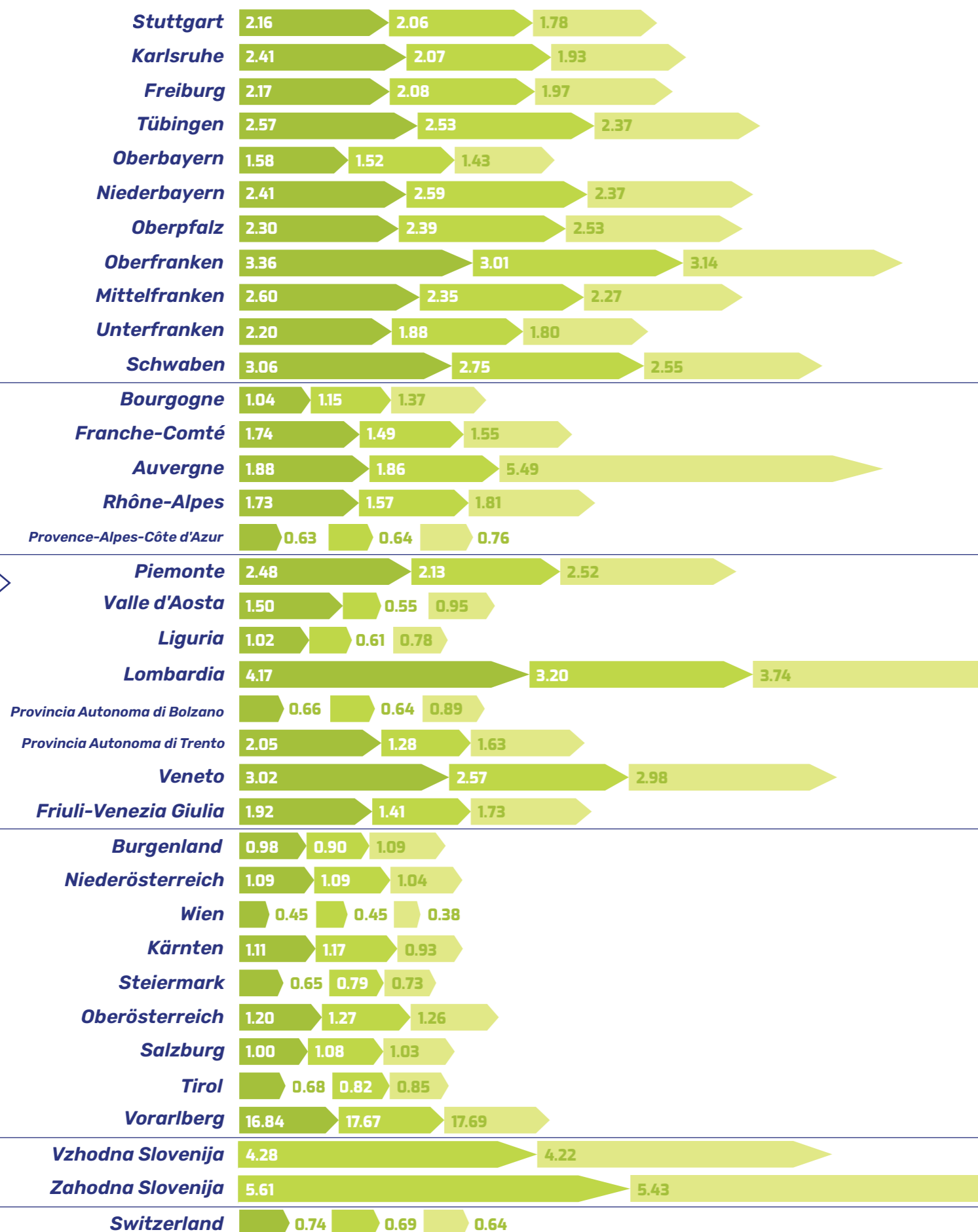

Treemap data:

GERMANY - EUSALP
- Stuttgart 1.78
- Karlsruhe 1.93
- Freiburg 1.97
- Tübingen 2.37
- Oberbayern 1.43
- Oberfranken 3.14
- Mittelfranken 2.27
- Niederbayern 2.37
- Oberpfalz 2.53
- Unterfranken 1.8
- Schwaben 2.55

FRANCE - EUSALP
- Bourgogne 1.37
- Franche-Comté 1.55
- Auvergne 5.49
- Rhône-Alpes 1.81
- Provence-Alpes-Côte d'Azur 0.76

ITALY - EUSALP
- Piemonte 2.52
- Lombardia 3.74
- Trento 1.63
- Veneto 2.98
- Valle d'Aosta 0.95
- Friuli-Venezia Giulia 1.73
- Liguria 0.78
- Bolzano 0.89

AUSTRIA
- Burgenland 1.09
- Wien 0.38
- Kärnten 0.93
- Oberösterreich 1.26
- Tirol 0.85
- Vorarlberg 1.51
- Niederösterreich 1.04
- Steiermark 0.73
- Salzburg 1.03

SLOVENIA
- Vzhodna Slovenija 4.22
- Zahodna Slovenija 5.43

Switzerland 0.64

REGESTIONAL BUSINESS DENSITY 2011 - 2015 - 2018

REGIONAL BUSINESS DENSITY
2011 - 2015 - 2018

As a matter of graphical representation, some sizes exceed the page border. In this case, please refer to the value of the indicator written inside.
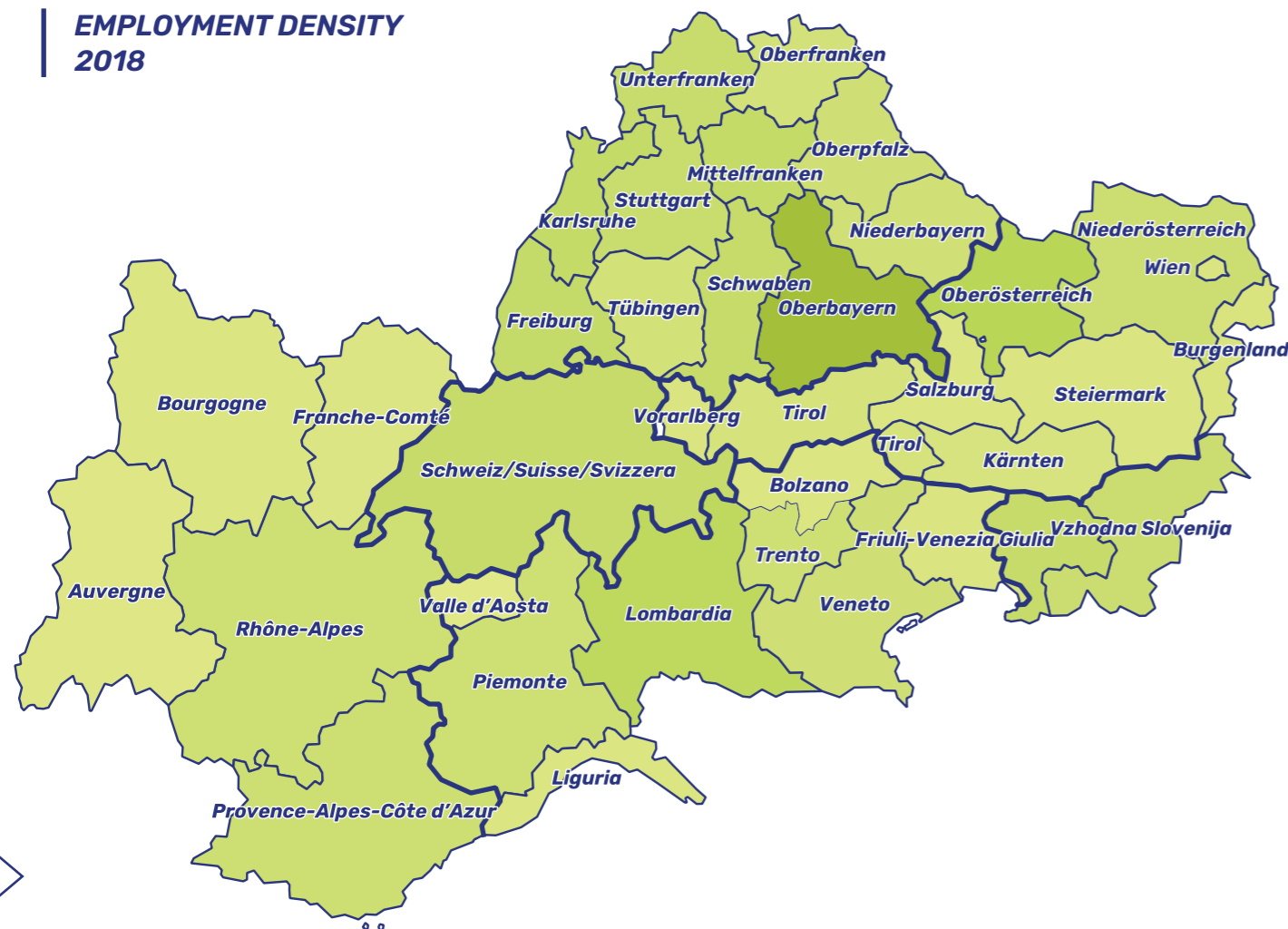
| 2011 | 2015 | 2018 |

Region	2011	2015	2018
Stuttgart	2.16	2.06	1.78
Karlsruhe	2.41	2.07	1.93
Freiburg	2.17	2.08	1.97
Tübingen	2.57	2.53	2.37
Oberbayern	1.58	1.52	1.43
Niederbayern	2.41	2.59	2.37
Oberpfalz	2.30	2.39	2.53
Oberfranken	3.36	3.01	3.14
Mittelfranken	2.60	2.35	2.27
Unterfranken	2.20	1.88	1.80
Schwaben	3.06	2.75	2.55
Bourgogne	1.04	1.15	1.37
Franche-Comté	1.74	1.49	1.55
Auvergne	1.88	1.86	5.49
Rhône-Alpes	1.73	1.57	1.81
Provence-Alpes-Côte d'Azur	0.63	0.64	0.76
Piemonte	2.48	2.13	2.52
Valle d'Aosta	1.50	0.55	0.95
Liguria	1.02	0.61	0.78
Lombardia	4.17	3.20	3.74
Provincia Autonoma di Bolzano	0.66	0.64	0.89
Provincia Autonoma di Trento	2.05	1.28	1.63
Veneto	3.02	2.57	2.98
Friuli-Venezia Giulia	1.92	1.41	1.73
Burgenland	0.98	0.90	1.09
Niederösterreich	1.09	1.09	1.04
Wien	0.45	0.45	0.38
Kärnten	1.11	1.17	0.93
Steiermark	0.65	0.79	0.73
Oberösterreich	1.20	1.27	1.26
Salzburg	1.00	1.08	1.03
Tirol	0.68	0.82	0.85
Vorarlberg	16.84	17.67	17.69
Vzhodna Slovenija	4.28		4.22
Zahodna Slovenija	5.61		5.43
Switzerland	0.74	0.69	0.64

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CHANGE 2011-2018

CHANGE
2011-2018

The plastics sector on average in the EUSALP area shows a substantial stagnation in the density of production units (+2.2% growth). Only French regions show a higher density growth of +31.0%. Furthermore, it should be noted that the Autonomous Province of Bozen/Bolzano has an inverse growth rate of business density compared to the trend in the other regions of the Italian Alpine region: density increases in the Province by +35.4%, while in the other Italian regions on average density drops by -6.5%. The only German region showing a growing trend is the Oberpfalz region (+10.0%).

37

Auvergne
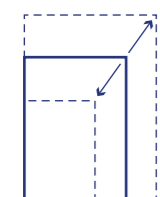Provincia Autonoma di Bolzano
Bourgogne
FRANCE (EUSALP)
Tirol
Provence-Alpes-Côte d'Azur
Steiermark
Burgenland
Oberpfalz
Oberösterreich
Vorarlberg
Rhône-Alpes
Salzburg
Piemonte
AUSTRIA
Veneto
Niederbayern
Vzhodna Slovenija
SLOVENIA
Zahodna Slovenija
Niederösterreich
ITALY (EUSALP)
Oberfranken
Tübingen
Freiburg
Oberbayern
Friuli-Venezia Giulia
Lombardia
Franche-Comté
GERMANY (EUSALP)
Mittelfranken
SWITZERLAND
Wien
Schwaben
Kärnten
Stuttgart
Unterfranken
Karlsruhe
Provincia Autonoma di Trento
Liguria
Valle d'Aosta

-40   -20   0   20   40   60   80
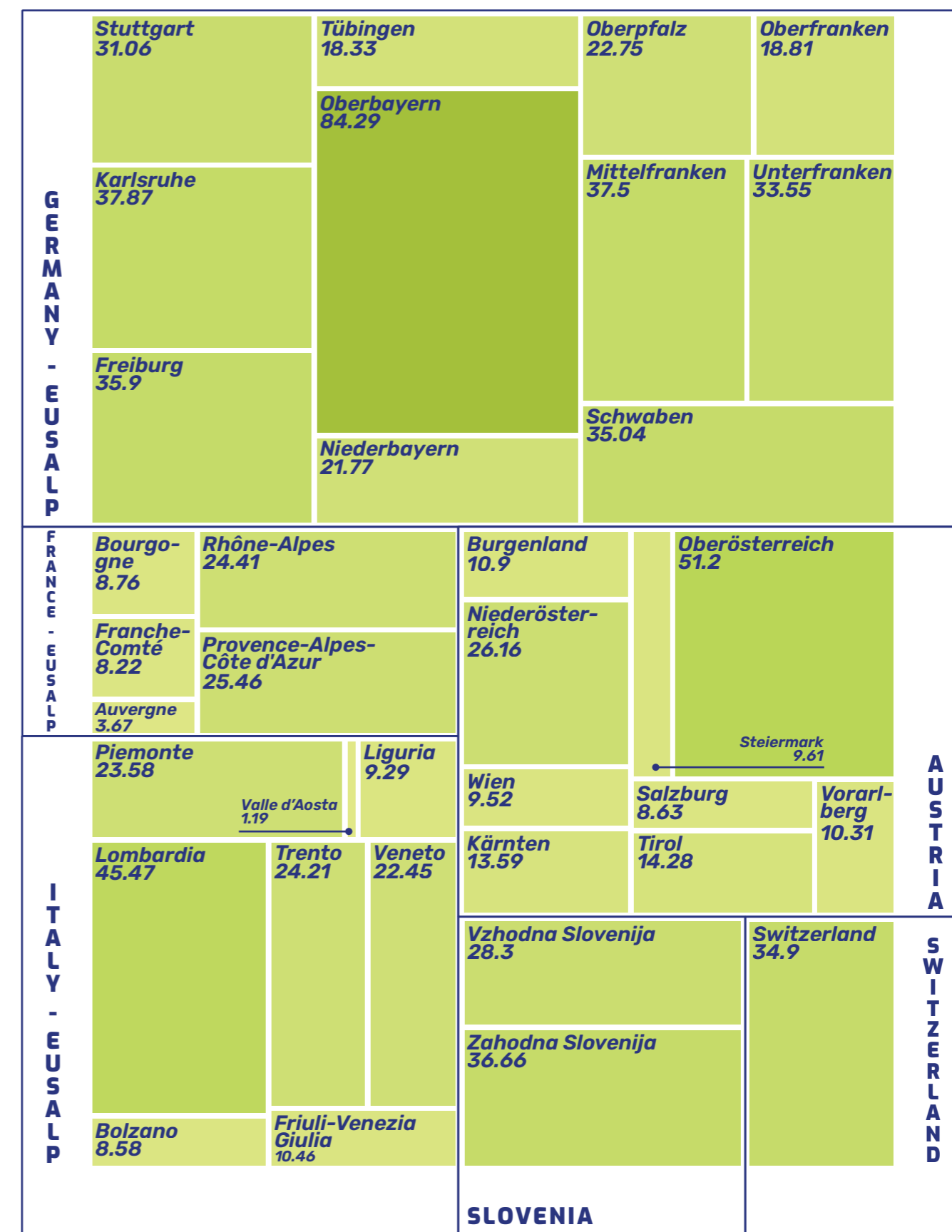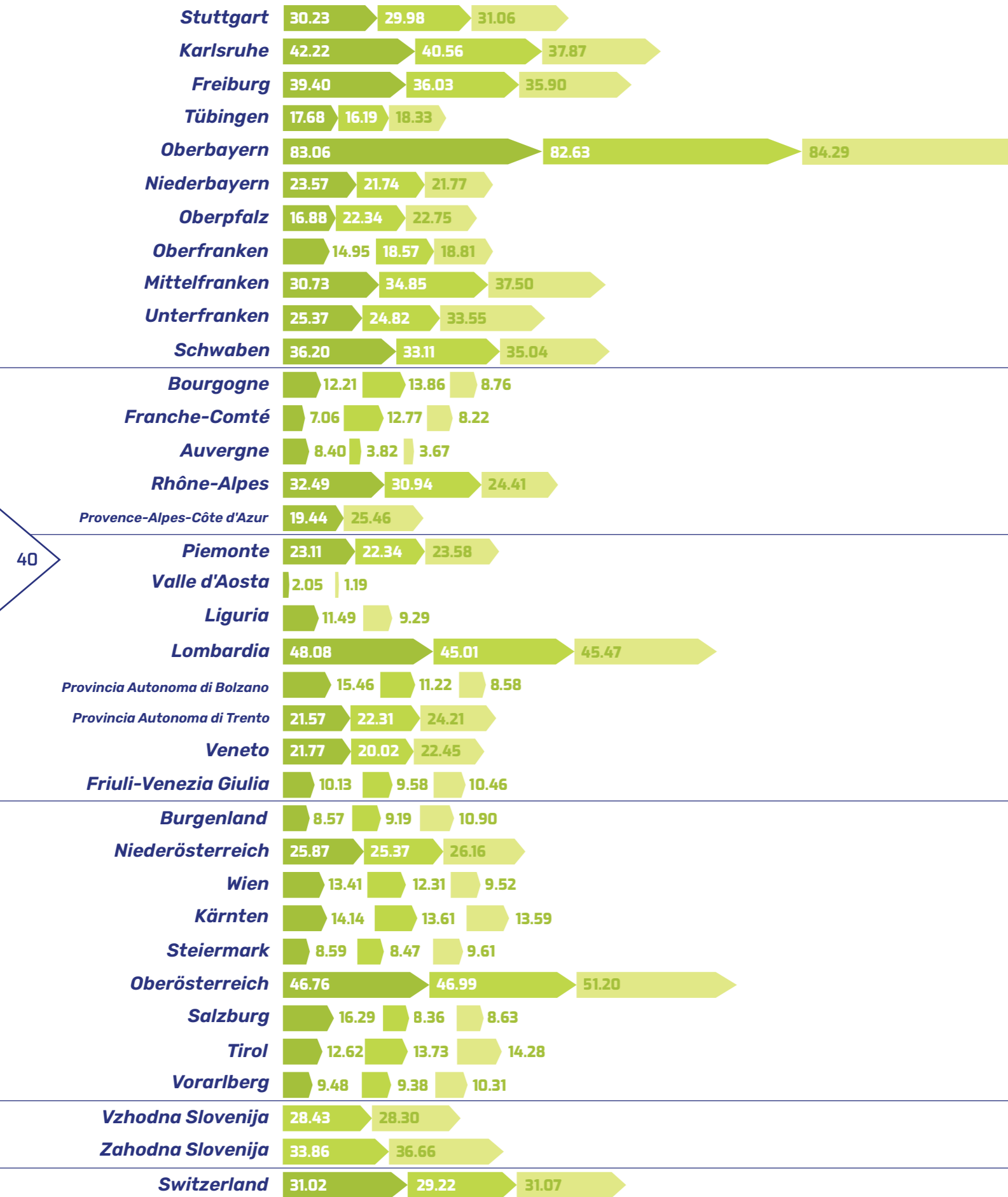
CHEMISTRY
▲▲▲▲▲▲▲▲▲▲

How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.

The **colour** of each square corresponds to the colour of each region in the map.

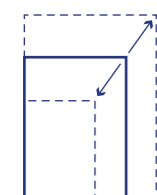The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.
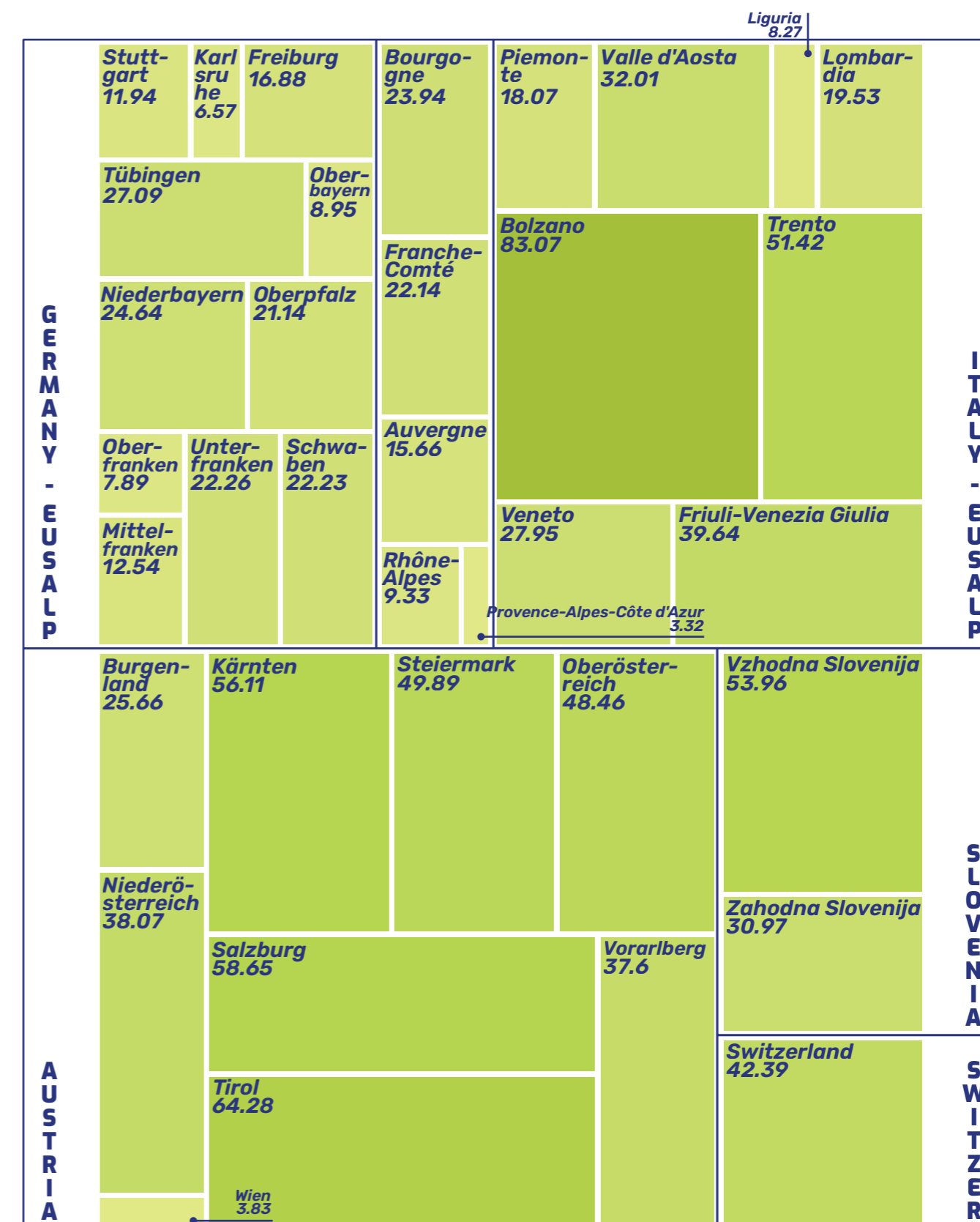
The data shown in the representation of the second indicator applied to the chemical production sector, show in 2018 higher values in the regions Oberbayern (84.3 units), Oberösterreich (51.2 units) and Lombardy (45.5 units). In 2018 in the Alpine region as a whole, more than 30 workers per 10,000 inhabitants are employed in the production activities of the analysed sector. The employment density of the chemical sector is above the average for the entire EUSALP area for most German, Swiss and Slovenian regions. Among the Italian regions, only Lombardy has a high level of employment concentration, while the other regions have much lower values than the average for the Alpine area. Moreover, no French region is above the average level of employment concentration. There is therefore a manufacturing vocation in the chemical sector of companies located in the Alpine regions of Germany, Switzerland and Slovenia, in addition to the region of Lombardy and Oberösterreich. There is also a strong lack of productive specialisation in the regions of the north-western Alpine belt including Valle d'Aosta, Auvergne, Bourgogne and Franche-Comté.

GERMANY - EUSALP

- Stuttgart 31.06
- Tübingen 18.33
- Oberpfalz 22.75
- Oberfranken 18.81
- Oberbayern 84.29
- Mittelfranken 37.5
- Unterfranken 33.55
- Karlsruhe 37.87
- Schwaben 35.04
- Freiburg 35.9
- Niederbayern 21.77

FRANCE - EUSALP

- Bourgogne 8.76
- Rhône-Alpes 24.41
- Franche-Comté 8.22
- Provence-Alpes-Côte d'Azur 25.46
- Auvergne 3.67

ITALY - EUSALP

- Piemonte 23.58
- Liguria 9.29
- Valle d'Aosta 1.19
- Lombardia 45.47
- Trento 24.21
- Veneto 22.45
- Bolzano 8.58
- Friuli-Venezia Giulia 10.46

AUSTRIA

- Burgenland 10.9
- Oberösterreich 51.2
- Niederösterreich 26.16
- Steiermark 9.61
- Wien 9.52
- Salzburg 8.63
- Vorarlberg 10.31
- Kärnten 13.59
- Tirol 14.28

SLOVENIA

- Vzhodna Slovenija 28.3
- Zahodna Slovenija 36.66

SWITZERLAND

- Switzerland 34.9

REGIONAL EMPLOYMENT DENSITY 2011 - 2015 - 2018

2011 2015 2018

Region	2011	2015	2018
Stuttgart	30.23	29.98	31.06
Karlsruhe	42.22	40.56	37.87
Freiburg	39.40	36.03	35.90
Tübingen	17.68	16.19	18.33
Oberbayern	83.06	82.63	84.29
Niederbayern	23.57	21.74	21.77
Oberpfalz	16.88	22.34	22.75
Oberfranken	14.95	18.57	18.81
Mittelfranken	30.73	34.85	37.50
Unterfranken	25.37	24.82	33.55
Schwaben	36.20	33.11	35.04
Bourgogne	12.21	13.86	8.76
Franche-Comté	7.06	12.77	8.22
Auvergne	8.40	3.82	3.67
Rhône-Alpes	32.49	30.94	24.41
Provence-Alpes-Côte d'Azur	19.44	25.46	
Piemonte	23.11	22.34	23.58
Valle d'Aosta	2.05	1.19	
Liguria	11.49	9.29	
Lombardia	48.08	45.01	45.47
Provincia Autonoma di Bolzano	15.46	11.22	8.58
Provincia Autonoma di Trento	21.57	22.31	24.21
Veneto	21.77	20.02	22.45
Friuli-Venezia Giulia	10.13	9.58	10.46
Burgenland	8.57	9.19	10.90
Niederösterreich	25.87	25.37	26.16
Wien	13.41	12.31	9.52
Kärnten	14.14	13.61	13.59
Steiermark	8.59	8.47	9.61
Oberösterreich	46.76	46.99	51.20
Salzburg	16.29	8.36	8.63
Tirol	12.62	13.73	14.28
Vorarlberg	9.48	9.38	10.31
Vzhodna Slovenija	28.43	28.30	
Zahodna Slovenija	33.86	36.66	
Switzerland	31.02	29.22	31.07

CHANGE 2011-2018

The regions with a strong production specialisation, Oberbayern and Oberösterreich, tend to consolidate their structural characteristic: between 2011 and 2018, the density of employment in the sector increased by +1.5% and +9.5% respectively. Lombardy, on the other hand, lost percentage points in terms of employment density over the same period (-5.4%). In general, the density of chemical employment in the EUSALP area remains stable; it increases by more than 30% in the German regions of Oberpfalz and Unterfranken and in the Provence-Alpes-Côte d'Azur region.

Change 2011-2018 (ordered high to low):
- Oberpfalz
- Unterfranken
- Provence-Alpes-Côte d'Azur
- Burgenland
- Oberfranken
- Mittelfranken
- Franche-Comté
- Tirol
- Provincia Autonoma di Trento
- Steiermark
- Oberösterreich
- Vorarlberg
- Zahodna Slovenija
- SLOVENIA
- Tübingen
- Friuli-Venezia Giulia
- Veneto
- GERMANY (EUSALP)
- Stuttgart
- Piemonte
- Oberbayern
- Niederösterreich
- Vzhodna Slovenija
- AUSTRIA
- ITALY (EUSALP)
- Schwaben
- Kärnten
- Lombardia
- Niederbayern
- FRANCE (EUSALP)
- Freiburg
- Karlsruhe
- SWITZERLAND
- Liguria
- Rhône-Alpes
- Bourgogne
- Wien
- Valle d'Aosta
- Provincia Autonoma di Bolzano
- Salzburg
- Auvergne

Axis: -60 -50 -40 -30 -20 -10 0 10 20 30 40

Map labels:
Oberfranken, Unterfranken, Oberpfalz, Mittelfranken, Stuttgart, Karlsruhe, Niederbayern, Niederösterreich, Wien, Schwaben, Oberbayern, Oberösterreich, Freiburg, Tübingen, Bourgogne, Franche-Comté, Vorarlberg, Tirol, Salzburg, Steiermark, Schweiz/Suisse/Svizzera, Tirol, Kärnten, Bolzano, Burgenland, Auvergne, Rhône-Alpes, Valle d'Aosta, Lombardia, Veneto, Trento, Friuli-Venezia Giulia, Vzhodna Slovenija, Piemonte, Liguria, Provence-Alpes-Côte d'Azur

WOOD

▲▲▲▲

How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

The wood sector shows an anomalous distribution of employment density compared to other sectors. From the map it is clear that production in the sector is specialised in the south-eastern part of the Alpine region, i.e. in the Italian, Austrian and Slovenian regions.

In the autonomous province of Bolzano, more than 80 employees per 10,000 inhabitants are involved in wood manufacturing, followed by the Austrian regions of Tirol, Salzbrug and Kärnten, Vzhodna Slovenija and the autonomous province of Trento. All regions have an employment density of more than 50 per 10,000 inhabitants.

On average in the EUSALP area about 23 employees for every 10,000 inhabitants are employed in the wood sector, with below-average values in French regions (especially Provence), German regions (especially Oberfranken and Karlsruhe) and the Vienna city region. This confirms what was observed earlier when applying the indicator to the chemical sector and what we will observe later: regions that have a relatively low density of employees in the wood sector have a more evident

productive specialisation in the other three sectors studied, which we could define as strictly manufacturing (or, in the case of Vienna, in non-manufacturing sectors such as tourism industry).

Treemap values:

GERMANY - EUSALP:
Stuttgart 11.94, Karlsruhe 6.57, Freiburg 16.88, Tübingen 27.09, Oberbayern 8.95, Niederbayern 24.64, Oberpfalz 21.14, Oberfranken 7.89, Unterfranken 22.26, Schwaben 22.23, Mittelfranken 12.54

Bourgogne 23.94, Franche-Comté 22.14, Auvergne 15.66, Rhône-Alpes 9.33, Provence-Alpes-Côte d'Azur 3.32

ITALY - EUSALP:
Piemonte 18.07, Valle d'Aosta 32.01, Liguria 8.27, Lombardia 19.53, Bolzano 83.07, Trento 51.42, Veneto 27.95, Friuli-Venezia Giulia 39.64

AUSTRIA:
Burgenland 25.66, Kärnten 56.11, Steiermark 49.89, Oberösterreich 48.46, Niederösterreich 38.07, Salzburg 58.65, Vorarlberg 37.6, Tirol 64.28, Wien 3.83

SLOVENIA:
Vzhodna Slovenija 53.96, Zahodna Slovenija 30.97

SWITZERLAND:
Switzerland 42.39

REGIONAL EMPLOYMENT DENSITY 2011 - 2015 - 2018

As a matter of graphical representation, some sizes exceed the page border. In this case, please refer to the value of the indicator written inside.

2011 2015 2018

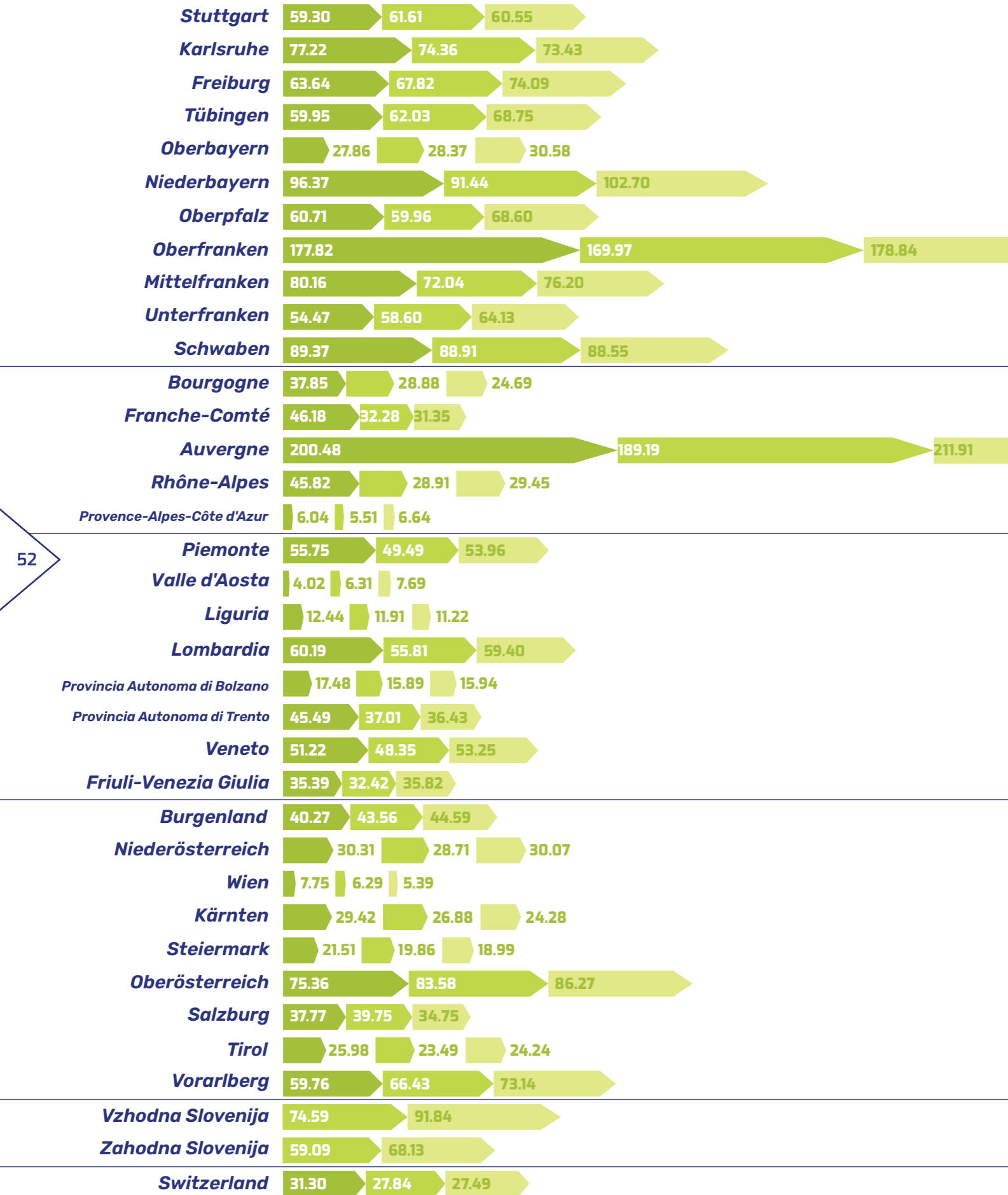| Region	2011	2015	2018
Stuttgart	14.12	12.27	11.94
Karlsruhe	6.88	6.70	6.57
Freiburg	17.58	16.86	16.88
Tübingen	28.74	24.98	27.09
Oberbayern	9.35	8.67	8.95
Niederbayern	22.11	23.34	24.64
Oberpfalz	19.54	18.79	21.14
Oberfranken	7.20	6.86	7.89
Mittelfranken	11.65	11.59	12.54
Unterfranken	21.92	19.99	22.26
Schwaben	21.05	21.08	22.23
Bourgogne	19.35	18.15	23.94
Franche-Comté	29.55	25.07	22.14
Auvergne	17.32	15.02	15.66
Rhône-Alpes	10.72	9.82	9.33
Provence-Alpes-Côte d'Azur	4.34	3.32	
Piemonte	24.66	19.04	18.07
Valle d'Aosta	42.36	33.75	32.01
Liguria	9.03	7.60	8.27
Lombardia	27.92	20.74	19.53
Provincia Autonoma di Bolzano	111.14	76.93	83.07
Provincia Autonoma di Trento	62.03	51.47	51.42
Veneto	43.18	31.62	27.95
Friuli-Venezia Giulia	49.66	43.72	39.64
Burgenland	34.89	29.48	25.66
Niederösterreich	39.17	35.31	38.07
Wien	5.21	5.65	3.83
Kärnten	59.15	54.26	56.11
Steiermark	52.70	48.67	49.89
Oberösterreich	52.05	48.75	48.46
Salzburg	62.46	58.04	58.65
Tirol	62.88	60.97	64.28
Vorarlberg	37.45	41.42	37.60
Vzhodna Slovenija	51.04	53.96	
Zahodna Slovenija	27.94	30.97	
Switzerland	44.67	44.54	42.39

WOOD

CHANGE 2011-2018

The most important fact that we can observe from the graphical representation of the change in the indicator over the period 2011-2018 is the actual decrease in employment density in most regions. The decrease is more intense in the Italian (especially in Veneto and Lombardy, with values above -30%), Austrian and French regions. On average in the EUSALP area, employment density in the sector falls by around 10%. The only regions bucking the trend are Bourgogne (+23.7%), Niederbayern (+11.5%) and Zahodna Slovenija (+10.8%).

Bourgogne
Niederbayern
Zahodna Slovenija
Oberfranken
Oberpfalz
Mittelfranken
SLOVENIA
Vzhodna Slovenija
Schwaben
Tirol
Unterfranken
Vorarlberg
GERMANY (EUSALP)
Niederösterreich
Freiburg
Oberbayern
Karlsruhe
Kärnten
SWITZERLAND
Steiermark
Tübingen
Salzburg
AUSTRIA
Oberösterreich
Liguria
Auvergne
FRANCE (EUSALP)
Rhône-Alpes
Stuttgart
Provincia Autonoma di Trento
Friuli-Venezia Giulia
Provence-Alpes-Côte d'Azur
Valle d'Aosta
Franche-Comté
Provincia Autonoma di Bolzano
Burgenland (AT)
Wien
Piemonte
ITALY (EUSALP)
Lombardia
Veneto

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25

WOOD

MECHANICS AND MECHATRO- NICS

▲▲▲▲▲▲▲▲

The data shown in the map highlight the highest value of the mechanical-mechatronics sector: in 2018, up from previous years, in the Alpine region as a whole more than 400 people per 10,000 inhabitants work in local units in this sector. The German regions also rank in the top six for production specialisation in the sector in relation to the other EUSALP regions, with values ranging from 700 to 800 employees per 10,000 inhabitants. This is followed by the adjacent Austrian regions of Vorarlberg and Oberösterreich. Slovenia, Italy and Switzerland have an employment density in the sector in line with the EUSALP average, i.e. around 400 employees per 10,000 inhabitants. Although two Austrian regions have a very high employment density in the sector, on average the other regions have values below the Alpine average. The French regions also show figures that are far from the trend for the whole belt: among the French regions, the Rhône-Alpes region has the highest density (223.0 jobs per 10,000 inhabitants).

There is thus a high level of specialisation in the mechanics and mechatronics sector in the regions north of the Alps

(Austria and Germany), a medium level of specialisation in the south-east (Switzerland, Italy, Slovenia) and a lower level of specialisation in the west (France) or in regions with other manufacturing vocations (Wien, Valle d'Aosta, Burgenland).

REGIONAL EMPLOYMENT DENSITY
2011 - 2015 - 2018

2011 **2015** **2018**

Region	2011	2015	2018
Stuttgart	705.41	722.18	748.97
Karlsruhe	558.89	539.94	539.87
Freiburg	748.70	765.25	793.52
Tübingen	780.33	810.17	857.95
Oberbayern	353.52	350.00	365.21
Niederbayern	450.51	477.80	510.49
Oberpfalz	733.58	757.29	809.12
Oberfranken	505.64	525.13	563.75
Mittelfranken	688.84	697.15	702.24
Unterfranken	606.26	589.24	603.70
Schwaben	644.98	691.85	727.92
Bourgogne	175.12	147.87	133.26
Franche-Comté	234.87	202.33	210.19
Auvergne	137.52	131.67	123.58
Rhône-Alpes	245.51	230.56	223.03
Provence-Alpes-Côte d'Azur	101.72	94.46	109.90
Piemonte	382.70	348.28	369.44
Valle d'Aosta	210.87	168.59	173.37
Liguria	247.18	216.62	217.62
Lombardia	494.25	448.98	454.83
Provincia Autonoma di Bolzano	236.14	223.58	254.82
Provincia Autonoma di Trento	201.56	204.01	206.71
Veneto	470.02	456.25	497.65
Friuli-Venezia Giulia	446.07	460.40	487.07
Burgenland	169.48	174.30	183.51
Niederösterreich	277.25	280.27	298.05
Wien	172.81	149.41	132.30
Kärnten	335.02	337.22	345.34
Steiermark	412.15	432.12	455.00
Oberösterreich	541.31	579.63	610.20
Salzburg	240.20	248.15	269.77
Tirol	263.74	297.31	317.09
Vorarlberg	545.03	586.04	637.51
Vzhodna Slovenija	492.67	546.97	
Zahodna Slovenija	362.17	411.01	
Switzerland	477.39	420.17	405.72

48

49

CHANGE
2011-2018

The graph shows a substantial upward trend in employment density in the sector in most of the regions considered. The regions with the highest growth rates are Tirol and Vorarlberg with values around +20%. The remaining Austrian and German regions are followed by Zahodna Slovenija (+13.5%). The only regions with positive rates of change apart from Germany, Austria and Slovenia are Friuli Venezia Giulia (+9.2%), Provence-Alpes-Côte d'Azur (+8.0%), Bolzano (+7.9%), Veneto (+5.9%) and Trento (+2.6%). Switzerland shows a severe decline in employment density (–15.0%), as does Lombardy (–8.0%).

Tirol
Vorarlberg
Zahodna Slovenija
Niederbayern
Schwaben
Oberösterreich
Salzburg
SLOVENIA
Oberfranken
Vzhodna Slovenija
Steiermark
Oberpfalz
Tübingen
Friuli-Venezia Giulia
Burgenland
Provence-Alpes-Côte d'Azur
Provincia Autonoma di Bolzano
Niederösterreich
AUSTRIA
Stuttgart
Freiburg
Veneto
GERMANY (EUSALP)
Oberbayern
Kärnten
Provincia Autonoma di Trento
Mittelfranken
Unterfranken
ITALY (EUSALP)
Karlsruhe
Piemonte
FRANCE (EUSALP)
Lombardia
Rhône-Alpes
Auvergne
Franche-Comté
Liguria
SWITZERLAND
Valle d'Aosta
Wien
Bourgogne

-25 -20 -15 -10 -5 0 5 10 15 20 25

Map labels:

Oberfranken
Unterfranken
Oberpfalz
Mittelfranken
Stuttgart
Karlsruhe
Niederbayern
Niederösterreich
Wien
Schwaben
Oberbayern
Oberösterreich
Freiburg
Tübingen
Burgenland
Bourgogne
Franche-Comté
Vorarlberg
Tirol
Salzburg
Steiermark
Tirol
Kärnten
Schweiz/Suisse/Svizzera
Bolzano
Vzhodna Slovenija
Auvergne
Trento
Friuli-Venezia Giulia
Rhône-Alpes
Valle d'Aosta
Lombardia
Veneto
Piemonte
Liguria
Provence-Alpes-Côte d'Azur

PLASTIC
▲▲▲▲▲▲

How to read these data visualizations

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The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

We can say that the plastics manufacturing industry in the Alpine context develops at the extreme limits of the EUSALP area as shown in the map. In the West, there is clearly a very strong production specialisation in the sector in the Auvergne region (also corresponding to the high density of local units), which employs more than 200 units per 10,000 inhabitants in plastic production companies. In the east, the two north-eastern German regions of Oberfranken (178.8 units) and Niederbayern (102.7 units) and the Vzhodna Slovenija region (91.8 units) follow.
On average, in the EUSALP area, around 50 employees per 10,000 inhabitants are involved in plastics manufacturing in 2018. The Italian regions show values in line with the average for the entire Alpine region (Lombardy is in the lead with about 60 employees per 10,000 inhabitants, followed by Piedmont and Veneto). Below average are the French, Austrian and Swiss regions (especially Provence and the Vienna City Region).

Treemap (GERMANY - EUSALP):

Stuttgart 60.55
Karlsruhe 73.43
Freiburg 74.09
Tübingen 68.75
Oberbayern 30.58
Oberfranken 178.84
Mittelfranken 76.2
Niederbayern 102.7
Oberpfalz 68.6
Unterfranken 64.13
Schwaben 88.55

Treemap (FRANCE - EUSALP):

Bourgogne 24.69
Franche-Comté 31.35
Auvergne 211.91
Provence-Alpes-Côte d'Azur 6.64
Rhône-Alpes 29.45

Treemap (ITALY - EUSALP):

Piemonte 53.96
Lombardia 59.4
Valle d'Aosta 7.69
Trento 36.43
Friuli-Venezia Giulia 35.82
Liguria 11.22
Veneto 53.25
Bolzano 15.94

Treemap (AUSTRIA):

Burgenland 44.59
Wien 5.39
Kärnten 24.28
Oberösterreich 86.27
Tirol 24.24
Vorarlberg 73.14
Niederöster-reich 30.07
Steier-mark 18.99
Salzburg 34.75

Treemap (SLOVENIA):

Vzhodna Slovenija 91.84
Zahodna Slovenija 68.13
Switzerland 27.49

GERMANY - EUSALP
ITALY - EUSALP
AUSTRIA
FRANCE - EUSALP
SLOVENIA

REGIONAL EMPLOYMENT DENSITY 2011 - 2015 - 2018

2011 **2015** **2018**

Region	2011	2015	2018
Stuttgart	59.30	61.61	60.55
Karlsruhe	77.22	74.36	73.43
Freiburg	63.64	67.82	74.09
Tübingen	59.95	62.03	68.75
Oberbayern	27.86	28.37	30.58
Niederbayern	96.37	91.44	102.70
Oberpfalz	60.71	59.96	68.60
Oberfranken	177.82	169.97	178.84
Mittelfranken	80.16	72.04	76.20
Unterfranken	54.47	58.60	64.13
Schwaben	89.37	88.91	88.55
Bourgogne	37.85	28.88	24.69
Franche-Comté	46.18	32.28	31.35
Auvergne	200.48	189.19	211.91
Rhône-Alpes	45.82	28.91	29.45
Provence-Alpes-Côte d'Azur	6.04	5.51	6.64
Piemonte	55.75	49.49	53.96
Valle d'Aosta	4.02	6.31	7.69
Liguria	12.44	11.91	11.22
Lombardia	60.19	55.81	59.40
Provincia Autonoma di Bolzano	17.48	15.89	15.94
Provincia Autonoma di Trento	45.49	37.01	36.43
Veneto	51.22	48.35	53.25
Friuli-Venezia Giulia	35.39	32.42	35.82
Burgenland	40.27	43.56	44.59
Niederösterreich	30.31	28.71	30.07
Wien	7.75	6.29	5.39
Kärnten	29.42	26.88	24.28
Steiermark	21.51	19.86	18.99
Oberösterreich	75.36	83.58	86.27
Salzburg	37.77	39.75	34.75
Tirol	25.98	23.49	24.24
Vorarlberg	59.76	66.43	73.14
Vzhodna Slovenija	74.59	91.84	
Zahodna Slovenija	59.09	68.13	
Switzerland	31.30	27.84	27.49

CHANGE 2011-2018

The graph shows an almost parallel change in the sector's employment density: indeed, in the average of the EUSALP area, employment density remains almost unchanged (+1.4%) over the period 2011-2018. On the other hand, there is exponential growth in the Valle d'Aosta region (+91.0%), followed by Vzhodna Slovenija and Vorarlberg. The Swiss and French regions show a decrease in employment density of more than 10%.

Valle d'Aosta
Vzhodna Slovenija
Vorarlberg
SLOVENIA
Unterfranken
Freiburg
Zahodna Slovenija
Tübingen
Oberösterreich
Oberpfalz
Burgenland (AT)
Provence-Alpes-Côte d'Azur
Oberbayern
Niederbayern
Auvergne
Veneto
GERMANY (EUSALP)
Stuttgart
Austria
Friuli-Venezia Giulia
Oberfranken
ITALY (EUSALP)
Niederösterreich
Schwaben
Lombardia
Piemonte
Karlsruhe
Mittelfranken
Tirol
Salzburg
Provincia Autonoma di Bolzano
Liguria
Steiermark
SWITZERLAND
Kärnten
FRANCE (EUSALP)
Provincia Autonoma di Trento
Wien
Franche-Comté
Bourgogne
Rhône-Alpes

-40 -30 -20 -10 0 10 20 30 40 50 60 70

52

53

SOCIO-ECONOMIC INDICATORS OF THE ALPINE SPACE

INDICATOR 3

Numerator: **number of employees**
Denominator: **number of local units**
Units of measurement: **employment units per local unit**

INDICATOR 4

Numerator: **difference between the number of employees in year t and the number of employees year t-1**
Denominator: **number of employees in year t-1**
Units of measurement: **percentage**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

Indicator 3 is useful to understand the size of local units in the sectors under study and in the Alpine regions. Looking at the data presented below, a strong heterogeneity characterising the sectors as well as the regions is immediately apparent. This diversity can be explained by two elements: on the one hand, the peculiarity of production processes (for the chemical and plastic industry, for example) and, on the other hand, the intrinsic characteristics of the entrepreneurial fabric of each country. The change in company size can be attributed to a general reorganisation of the different sectors, due both to the closure of some companies and to their merger or division. The indicator is the result of the ratio between the number of employees and the number of local units for each sector in the different years.
Indicator 4 shows the rate of change of employment in the different sectors analysed. Again, the growth rates are very different between regions and, again, growth rates differ widely both between regions and between manufacturing sectors.
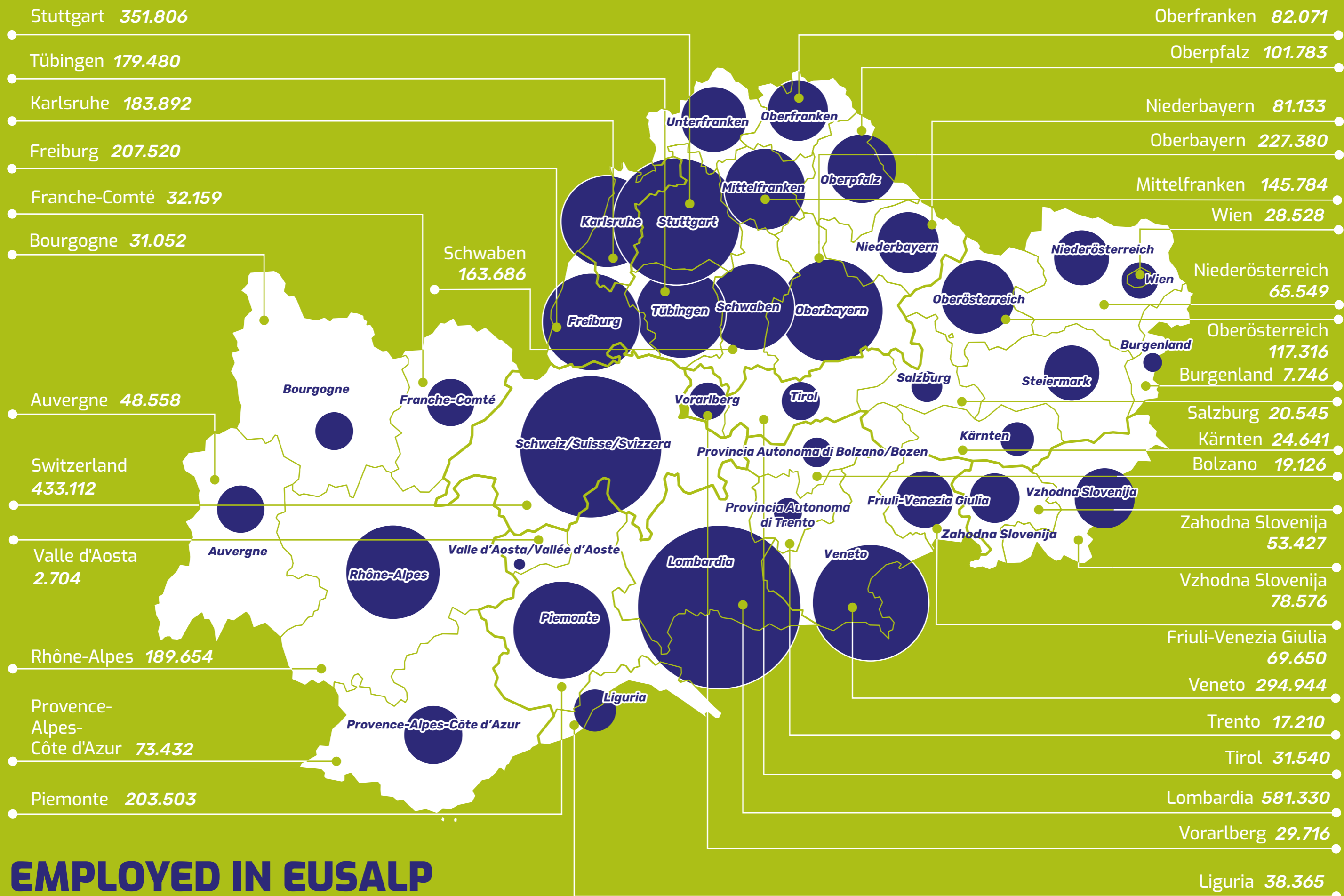
EMPLOYED IN EUSALP MANUFACTURING ** 2018**

*only the four sectors analysed were considered
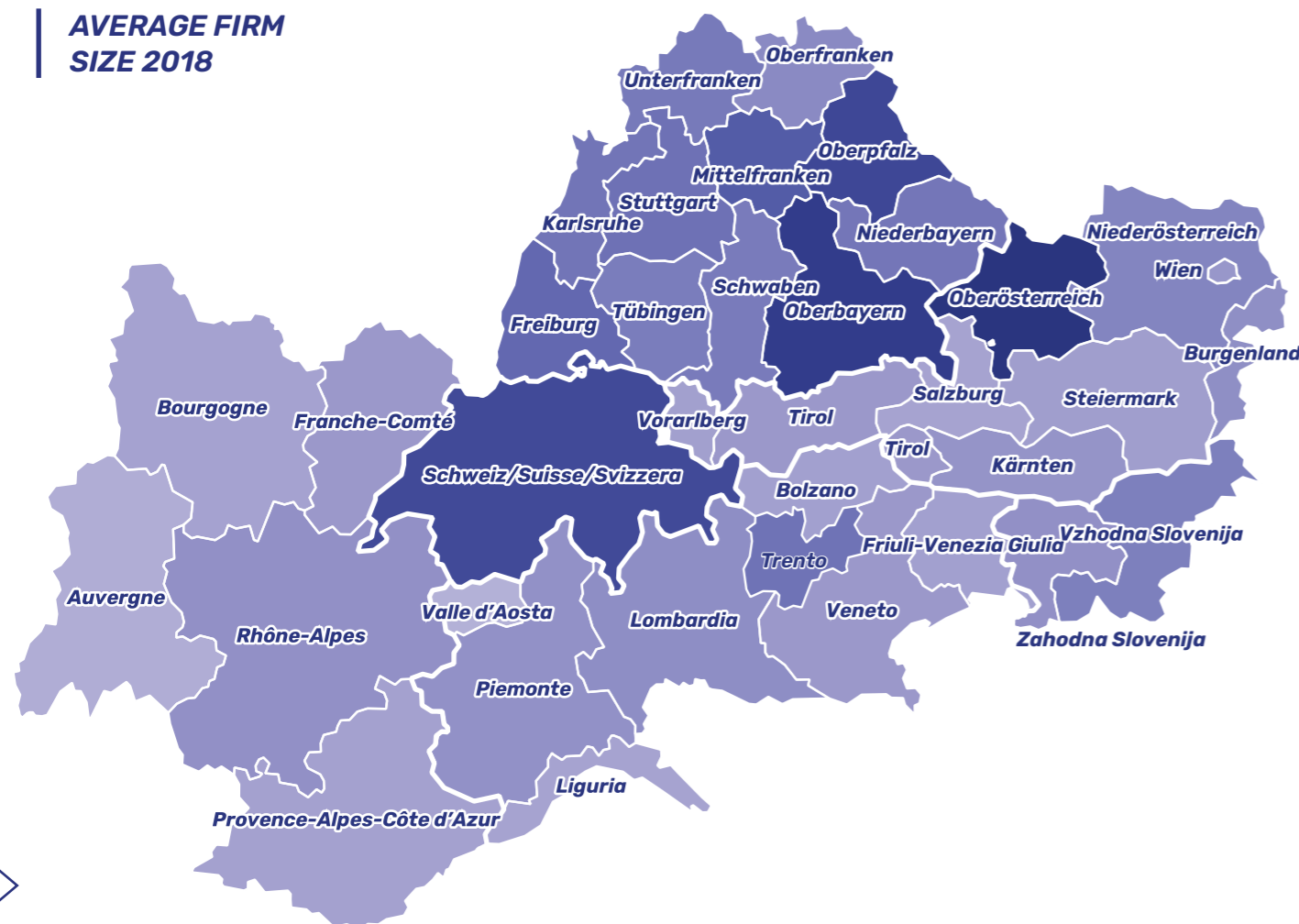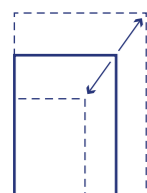
Stuttgart **351.806**
Tübingen **179.480**
Karlsruhe **183.892**
Freiburg **207.520**
Franche-Comté **32.159**
Bourgogne **31.052**
Schwaben **163.686**
Auvergne **48.558**
Switzerland **433.112**
Valle d'Aosta **2.704**
Rhône-Alpes **189.654**
Provence-Alpes-Côte d'Azur **73.432**
Piemonte **203.503**

Oberfranken **82.071**
Oberpfalz **101.783**
Niederbayern **81.133**
Oberbayern **227.380**
Mittelfranken **145.784**
Wien **28.528**
Niederösterreich **65.549**
Oberösterreich **117.316**
Burgenland **7.746**
Salzburg **20.545**
Kärnten **24.641**
Bolzano **19.126**
Zahodna Slovenija **53.427**
Vzhodna Slovenija **78.576**
Friuli-Venezia Giulia **69.650**
Veneto **294.944**
Trento **17.210**
Tirol **31.540**
Lombardia **581.330**
Vorarlberg **29.716**
Liguria **38.365**

56   57

Oberfranken
Unterfranken
Mittelfranken
Oberpfalz
Stuttgart
Karlsruhe
Niederbayern
Niederösterreich
Wien
Freiburg
Tübingen
Schwaben
Oberbayern
Oberösterreich
Bourgogne
Franche-Comté
Vorarlberg
Tirol
Salzburg
Steiermark
Schweiz/Suisse/Svizzera
Tirol
Kärnten
Burgenland
Bolzano
Auvergne
Friuli-Venezia Giulia
Vzhodna Slovenija
Rhône-Alpes
Valle d'Aosta
Trento
Veneto
Lombardia
Zahodna Slovenija
Piemonte
Provence-Alpes-Côte d'Azur
Liguria

58

CHEMISTRY
▲▲▲▲▲▲▲▲▲

Company size is a good indicator, not the only one, to observe the structure of the production fabric of a territory. In 2018, companies in the chemicals sector in the Oberösterreich, Oberbayern, Oberpfalz, Mittelfranken and Freiburg regions are medium-sized. In general, Swiss and German chemical companies are medium-sized, employing more than 70 people per local unit in the case of Switzerland and more than 50 people in the case of Germany. As for the companies located in the other regions, these are on average small (between 10 and 49 employees). The only exceptions are the regions of Valle d'Aosta and Auvergne with micro enterprises in the chemical sector, i.e. with fewer than 10 employees per local unit (3.8 and 5.2 employees per unit respectively). On average, in the chemical sector, companies in the EUSALP area employ about 30 people per local production unit: slightly below the average in the Austrian and Slovenian regions (30.3 and 27.6 employees per unit, respectively), while Italian and French companies show a greater detachment from the area's trend. In Italy, the average size of companies in the sector is just over 20 employees

per local unit (only the Province of Trento and Lombardy are above the country's average); in France, the average size is 16 employees per unit (only Rhône-Alpes and Franche-Comté are above the country's average).

59

GERMANY - EUSALP

Stuttgart 44.35
Oberbayern 77.15
Nieder-bayern 40.58
Oberpfalz 71.77
Karlsruhe 41.04
Freiburg 51.23
Oberfranken 27.49
Unter-franken 37.99
Schwaben 37.09
Mittelfranken 59.99
Tübingen 36.01

FRANCE

Bourgogne 12.4
Rhône-Alpes 23.27
Franche-Comté 17.62
Auvergne 5.18
Provence-Alpes-Côte d'Azur 12.52

ITALY - EUSALP

Piemonte 22.19
Liguria 11.22
Valle d'Aosta 3.75
Lombar-dia 25.52
Bolzano 13.32
Trento 43.57
Veneto 17.62
Friuli-Venezia Giulia 13.39

Burgenland 24.54
Steiermark 15.09
Oberösterreich 82
Niederösterreich 30.78
Wien 18.73
Salzburg 11.09
Tirol 17.59
Vorarlberg 13.93
Kärnten 20.59
Vzhodna Slovenija 34.65
Switzerland 70.49
Zahodna Slovenija 23.41

SLOVENIA

AUSTRIA

SWITZERLAND

REGIONAL AVERAGE FIRM SIZE 2011 - 2015 -2018

As a matter of graphical representation, some sizes exceed the page border. In this case, please refer to the value of the indicator written inside.

2011 **2015** **2018**

Region	2011	2015	2018
Stuttgart	37.53	41.57	44.35
Karlsruhe	37.12	39.14	41.04
Freiburg	53.09	50.62	51.23
Tübingen	24.92	28.22	36.01
Oberbayern	65.99	71.01	77.15
Niederbayern	34.55	32.95	40.58
Oberpfalz	51.69	57.60	71.77
Oberfranken	21.82	25.80	27.49
Mittelfranken	43.39	49.82	59.99
Unterfranken	29.23	31.92	37.99
Schwaben	29.94	33.69	37.09
Bourgogne	20.26	22.52	12.40
Franche-Comté	21.26	36.73	17.62
Auvergne	14.73	6.75	5.18
Rhône-Alpes	41.50	37.54	23.27
Provence-Alpes-Côte d'Azur	14.10		12.52
Piemonte	21.88	28.08	22.19
Valle d'Aosta	5.20		3.75
Liguria	10.34		11.22
Lombardia	24.66	33.52	25.52
Provincia Autonoma di Bolzano	33.74	22.38	13.32
Provincia Autonoma di Trento	29.66	38.68	43.57
Veneto	17.49	21.82	17.62
Friuli-Venezia Giulia	14.38	15.06	13.39
Burgenland	22.18		
Niederösterreich	36.21		
Wien	29.27	23.80	18.73
Kärnten	25.39	19.97	20.59
Steiermark	16.71	15.00	15.09
Oberösterreich	74.09	69.63	82.00
Salzburg	22.05	11.54	11.09
Tirol	21.26	19.25	17.59
Vorarlberg	12.96	13.65	13.93
Vzhodna Slovenija	37.46	34.65	
Zahodna Slovenija	27.12	23.41	
Switzerland	70.91	65.95	70.49

CHANGE 2011-2018

The graph shows a prevailing downward trend in the size of enterprises in the chemical sector. Over the period 2011-2018, 18 regions saw the number of employees per local unit decrease with an average of -24.8%; the other regions saw the size of companies in the sector increase by an average of +19.7%. On average, in the EUSALP area, the company size decreases by -3.6%; the regions that see a large increase in the number of employees per unit are the Province of Trento, Tübingen and Oberpfalz (around +40%), on the contrary a clear decrease is seen in the Auvergne regions and the Province of Bolzano (around -60%).

Provincia Autonoma di Trento
Tübingen
Oberpfalz
Mittelfranken
Unterfranken
Oberfranken
Schwaben
GERMANY (EUSALP)
Stuttgart
Niederbayern
Oberbayern
Oberösterreich
Karlsruhe
Burgenland (AT)
Liguria
Vorarlberg
Lombardia
ITALY (EUSALP)
Piemonte
Veneto
Switzerland
Freiburg
Friuli-Venezia Giulia
Vzhodna Slovenija
Steiermark
Provence-Alpes-Côte d'Azur
SLOVENIA
AUSTRIA
Zahodna Slovenija
Niederösterreich
Franche-Comté
Tirol
Kärnten
Valle d'Aosta
FRANCE (EUSALP)
Wien
Bourgogne
Rhône-Alpes
Salzburg
Provincia Autonoma di Bolzano
Auvergne

-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50

60

61

production unit).

WOOD

How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

Compared to the other sectors considered, enterprises in the wood sector are small in size: in fact, in 2018, on average EUSALP, enterprises employed around 7 people per local unit. For most regions, micro-enterprises with less than 10 employees operate in the sector: below the EUSALP average, the Italian regions (on average 4.3 employees per unit), the Slovenian regions (on average 4.2 employees per unit) and the French regions (on average 3.8 employees per unit) are positioned. Only the Austrian, Swiss and German regions have, on average, small enterprises (with more than 10 employees per unit): woodworking enterprises in the Tübingen region are the largest on average (27.0 employees per unit), along with those in the Oberpfalz region (25.4 employees per unit). With the exception of the units in Friuli Venezia Giulia and the Province of Bolzano, all Italian regions are populated by wood industry enterprises with less than 5 employees. Enterprises in France and Slovenia have an average of less than 4 employees per unit: in the Provence-Alpes-Côte d'Azur region, enterprises are predominantly one-man businesses (1.9 employees per

REGIONAL AVERAGE FIRM SIZE 2011 - 2015 - 2018

As a matter of graphical representation, some sizes exceed the page border. In this case, please refer to the value of the indicator written inside.

Legend: 2011 | 2015 | 2018

Region	2011	2015	2018
Stuttgart	18.28	18.91	20.96
Karlsruhe	8.65	9.70	11.28
Freiburg	12.47	15.14	17.46
Tübingen	23.11	22.65	27.03
Oberbayern	16.66	18.31	19.64
Niederbayern	13.94	16.64	21.35
Oberpfalz	19.94	20.97	20.97
Oberfranken	7.04	8.52	9.05
Mittelfranken	20.82	20.49	22.52
Unterfranken	11.60	14.43	18.86
Schwaben	16.28	19.00	21.92
Bourgogne	6.58	6.02	6.97
Franche-Comté	5.84	4.64	3.99
Auvergne	4.64	4.03	4.11
Rhône-Alpes	4.66	3.77	3.50
Provence-Alpes-Côte d'Azur	3.20	1.90	
Piemonte	3.58	3.69	3.65
Valle d'Aosta	2.40	2.29	2.39
Liguria	1.90	2.22	2.55
Lombardia	4.79	4.55	4.61
Provincia Autonoma di Bolzano	4.72	5.59	5.60
Provincia Autonoma di Trento	4.62	4.56	4.36
Veneto	4.98	4.44	4.22
Friuli-Venezia Giulia	6.14	6.08	5.82
Burgenland	11.28	10.24	11.21
Niederösterreich	11.98	10.97	12.64
Wien	6.39	6.47	5.24
Kärnten	11.24	10.15	11.12
Steiermark	13.88	12.49	14.32
Oberösterreich	11.56	10.86	11.52
Salzburg	11.37	10.63	10.66
Tirol	11.18	10.89	11.98
Vorarlberg	7.28	7.57	7.67
Vzhodna Slovenija	4.68	4.64	
Zahodna Slovenija	3.30	3.56	
Switzerland	11.02	11.77	12.12

CHANGE 2011-2018

Most regions see an increase in the average size of woodworking companies between 2011 and 2018, with an average of +21.2%. Some German regions and Liguria are leading the way with a variation of more than +30%. In the average of the EUSALP area, however, the size of companies in the sector remains almost unchanged, with a slight increase of +1.3%. Enterprise size decreases for 15 regions with an average of -11.0%. The French regions are at the bottom of the list, with reductions of more than 20%: the Provence-Alpes-Côte d'Azur region lost 40.5% of employees per local unit over the same period.

Change 2011-2018 (ranked, from highest increase to lowest):

- Unterfranken
- Niederbayern
- Freiburg
- Schwaben
- Liguria
- Karlsruhe
- GERMANY (EUSALP)
- Oberfranken
- Oberpfalz
- Provincia Autonoma di Bolzano
- Oberbayern
- Tübingen
- Stuttgart
- SWITZERLAND
- Mittelfranken
- Zahodna Slovenija
- Tirol
- Bourgogne
- Niederösterreich
- Vorarlberg
- Steiermark
- SLOVENIA
- Piemonte
- AUSTRIA
- Valle d'Aosta
- Oberösterreich
- Burgenland
- Vzhodna Slovenija
- Kärnten
- ITALY (EUSALP)
- Lombardia
- Friuli-Venezia Giulia
- Provincia Autonoma di Trento
- Salzburg
- Auvergne
- Veneto
- Wien
- FRANCE (EUSALP)
- Rhône-Alpes
- Franche-Comté
- Provence-Alpes-Côte d'Azur

Axis: -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70

WOOD

Oberfranken
Unterfranken
Oberpfalz
Mittelfranken
Stuttgart
Karlsruhe
Niederbayern
Niederösterreich
Schwaben
Wien
Freiburg
Tübingen
Oberbayern
Oberösterreich
Burgenland
Bourgogne
Franche-Comté
Vorarlberg
Tirol
Salzburg
Steiermark
Schweiz/Suisse/Svizzera
Tirol
Kärnten
Auvergne
Bolzano
Vzhodna Slovenija
Rhône-Alpes
Valle d'Aosta
Trento
Friuli-Venezia Giulia
Veneto
Lombardia
Zahodna Slovenija
Piemonte
Liguria
Provence-Alpes-Côte d'Azur

66

MECHANICS AND MECHATRO- NICS
▲▲▲▲▲▲▲▲

In 2018, in the EUSALP area, mechatronic mechanical manufacturing enterprises are predominantly small: in fact, on average these employ around 20 people per local unit. Only German SMEs in the Mittelfranken (57.9 employees per unit), Oberpfalz (56.7 employees per unit), Schwaben (53.4 employees per unit) and Oberfranken (50.8 employees per unit) regions can be considered medium-sized. Local units in the German, Swiss and Austrian regions employ on average more people in the same local unit than in the other countries of the EUSALP area. There are also micro-enterprises in the mechanics sector, with an average of fewer than 10 employees per local unit, in some regions of France (Provence-Alpes-Côte d'Azur, Auvergne and Bourgogne), Italy (Autonomous Province of Trento) and Slovenia (Zahodna Slovenija). As the map clearly shows, the picture is one of a highly fragmented industrial economic fabric in the southern regions of the Alpine belt and a more compact one in the northern regions. This reflects the manufacturing organisation of the countries, even outside the EUSALP regions.

67

GERMANY - EUSALP

Stuttgart 43.92
Oberbayern 33.29
Niederbayern 37.05
Oberpfalz 56.66
Karlsruhe 38.08
Oberfranken 50.75
Unter-franken 47.53
Schwaben 53.44
Freiburg 40.63
Mittelfranken 57.91
Tübingen 46.48

FRANCE - EUSALP

Bourgo-gne 8.88
Auve rgne 8.2
Rhône-Alpes 10.48
Franche-Comté 11.35

AUSTRIA

Burgen land 16.73
Niederö sterreich 24.48
Wien 22.11
Kärnten 22.98
Provence-Alpes-Côte d'Azur 7.18

SLOVENIA

Vzhodna Slovenija 12.97
Zahodna Slovenija 9.53

ITALY - EUSALP

Piemo nte 10.08
Valle d'Aosta 15.19
Ligu-ria 10.12
Lombardia 10.82
Veneto 12.14
Bolzano 12.42
Friuli-Venezia Giulia 16.04
Trento 8.77

Steiermark 35.27
Salzburg 18.52
Tirol 24.13
Oberösterreich 35.85
Vorarlberg 36.04

SWITZERLAND

Switzer-land 38.97

REGIONAL AVERAGE FIRM SIZE 2011 - 2015 - 2018

Legend: 2011 | 2015 | 2018

Region	2011	2015	2018
Stuttgart	37.03	40.15	43.92
Karlsruhe	34.73	35.89	38.08
Freiburg	33.89	37.03	40.63
Tübingen	38.37	41.69	46.48
Oberbayern	28.93	30.98	33.29
Niederbayern	32.35	34.74	37.05
Oberpfalz	48.19	52.63	56.66
Oberfranken	42.41	45.30	50.75
Mittelfranken	49.07	52.98	57.91
Unterfranken	44.58	43.58	47.53
Schwaben	44.15	48.50	53.44
Bourgogne	14.11	11.47	8.88
Franche-Comté	15.13	12.46	11.35
Auvergne	10.89	9.74	8.20
Rhône-Alpes	14.03	12.87	10.48
Provence-Alpes-Côte d'Azur	8.30	7.20	7.18
Piemonte	8.99	10.78	10.08
Valle d'Aosta	10.01	14.05	15.19
Liguria	9.82	11.45	10.12
Lombardia	9.84	11.94	10.82
Provincia Autonoma di Bolzano	12.14	12.47	12.42
Provincia Autonoma di Trento	8.17	9.73	8.77
Veneto	10.21	12.49	12.14
Friuli-Venezia Giulia	13.82	17.29	16.04
Burgenland	18.84	16.92	16.73
Niederösterreich	24.49	23.11	24.48
Wien	24.98	22.36	22.11
Kärnten	23.23	22.44	22.98
Steiermark	33.99	33.26	35.27
Oberösterreich	34.36	33.92	35.85
Salzburg	17.78	17.61	18.52
Tirol	21.67	23.00	24.13
Vorarlberg	32.36	33.16	36.04
Vzhodna Slovenija	12.61	12.97	
Zahodna Slovenija	8.62	9.53	
Switzerland	38.82	44.04	38.97

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CHANGE 2011-2018

The graph shows a clear upward trend in the average size of mechanical engineering companies in the EUSALP area. However, along with two Austrian regions (Burgenland and Vienna), all French regions show a negative rate of growth in the average size of local units, with the Auvergne, Franche-Comté, Rhône-Alpes and Bourgogne regions at the bottom of the list with a reduction of more than 20%. The German regions consolidate their trend of growth in company size, along with Valle d'Aosta (+51.8%). On average, companies in the sector in the EUSALP area are increasing their size by +6.4%.

69

Change ranking (top to bottom):

Valle d'Aosta
Tübingen
Schwaben
Freiburg
Oberfranken
Veneto
Stuttgart
Mittelfranken
Oberpfalz
GERMANY (EUSALP)
Friuli-Venezia Giulia
Oberbayern
Niederbayern
ITALY (EUSALP)
Piemonte
Vorarlberg
Tirol
Zahodna Slovenija
Lombardia
Karlsruhe
Provincia Autonoma di Trento
Unterfranken
SLOVENIA
Oberösterreich
Salzburg
Steiermark
Liguria
Vzhodna Slovenija
AUSTRIA
Provincia Autonoma di Bolzano
SWITZERLAND
Niederösterreich
Kärnten
Burgenland (AT)
Wien
Provence-Alpes-Côte d'Azur
FRANCE (EUSALP)
Auvergne
Franche-Comté
Rhône-Alpes
Bourgogne

Axis: -40 -30 -20 -10 0 10 20 30 40 50 60

70

71

PLASTIC

▲▲▲▲▲▲▲

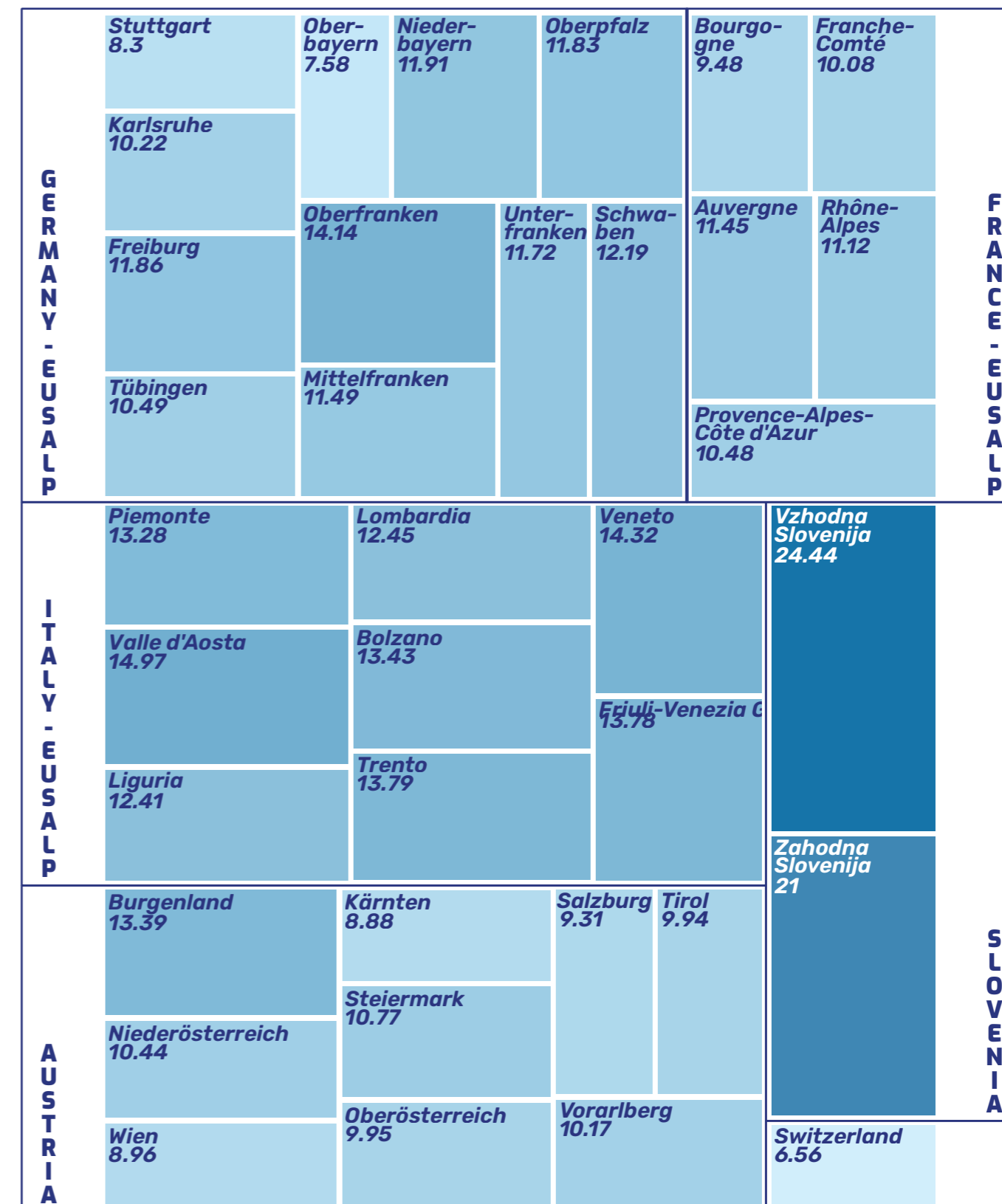**How to read these
data visualizations**

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region in the map.
The **intensity of the colour** changes
depending on the size of the
indicator: a darker colour
corresponds to a higher value of the
indicator.

Together with those in the chemical sector, enterprises
in the plastics sector are the largest of the four sectors
analysed. In 2018 in the EUSALP area, each local production
unit employs an average of around 25 people. Above the
area average are still Swiss companies (42.7 employees
per unit), Austrian companies (38.6 employees per unit)
and German companies (34.5 employees per unit). Below
the average for the area are the French regions (21.8
employees per unit), the Italian regions (17.4 employees
per unit) and the Slovenian regions (16.8 employees per
unit). In general, enterprises in the sector are small.
On average, local units in the Oberösterreich and
Oberfranken regions are medium-sized, while those in
the Provence-Alpes-Côte d'Azur and Valle d'Aosta regions
are micro-sized enterprises.

REGIONAL AVERAGE FIRM SIZE 2011 - 2015 - 2018

2011 2015 2018

Region	2011	2015	2018
Stuttgart	27.44	29.93	33.95
Karlsruhe	32.04	35.94	38.09
Freiburg	29.33	32.67	37.63
Tübingen	23.36	24.53	29.05
Oberbayern	17.67	18.72	21.42
Niederbayern	40.07	35.33	43.26
Oberpfalz	26.44	25.07	27.15
Oberfranken	52.92	56.44	56.95
Mittelfranken	30.81	30.66	33.60
Unterfranken	24.71	31.19	35.54
Schwaben	29.16	32.39	34.71
Bourgogne	36.36	25.07	18.04
Franche-Comté	26.56	21.64	20.20
Auvergne	106.61	101.48	38.57
Rhône-Alpes	26.49	18.42	16.29
Provence-Alpes-Côte d'Azur	9.55	8.60	8.74
Piemonte	22.51	23.22	21.43
Valle d'Aosta	2.68	11.57	8.08
Liguria	12.24	19.44	14.32
Lombardia	14.44	17.45	15.87
Provincia Autonoma di Bolzano	26.58	24.97	17.89
Provincia Autonoma di Trento	22.21	28.83	22.35
Veneto	16.99	18.81	17.88
Friuli-Venezia Giulia	18.46	22.99	20.73
Burgenland	40.93	48.31	40.78
Niederösterreich	27.72	26.26	28.87
Wien	17.36	13.95	14.14
Kärnten	26.42	23.06	26.19
Steiermark	33.28	25.01	26.17
Oberösterreich	62.88	66.00	68.35
Salzburg	33.28	36.91	33.68
Tirol	38.29	28.53	28.45
Vorarlberg	41.64	44.12	48.56
Vzhodna Slovenija	17.43	21.76	
Zahodna Slovenija	10.53	12.54	
Switzerland	42.25	40.10	42.71

CHANGE 2011-2018

Over the period 2011-2018, the average size of enterprises in the plastics sector remains almost unchanged (-0.7%). There is strong growth for the sector's enterprises located in the Slovenian (+22.6% on average) and German (+17.9% on average) regions. Businesses in the sector in the Italian, Austrian and Swiss regions show growth rates of between 1 and 6%. On the contrary, companies in the French regions also see a strong contraction in average company size in the plastics sector (-37.4%).

Valle d'Aosta
Unterfranken
Freiburg
Vzhodna Slovenija
Tübingen
Stuttgart
SLOVENIA
Oberbayern
Zahodna Slovenija
Schwaben
Karlsruhe
GERMANY (EUSALP)
Liguria
Vorarlberg
Friuli-Venezia Giulia
Lombardia
Mittelfranken
Oberösterreich
Niederbayern
Oberfranken
ITALY (EUSALP)
Veneto
Niederösterreich
Oberpfalz
AUSTRIA
SWITZERLAND
Provincia Autonoma di Trento
Burgenland (AT)
Kärnten
Piemonte
Provence-Alpes-Côte d'Azur
Salzburg
Wien
Steiermark
Franche-Comté
Tirol
Provincia Autonoma di Bolzano
FRANCE (EUSALP)
Rhône-Alpes
Bourgogne
Auvergne

-80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220

EMPLOYMENT GROWTH RATE 2011-2018

CHEMISTRY

Between 2011 and 2018, employment in the chemical sector in the EUSALP area increased overall by +4.2%: in 2011, 2015 and 2018 the employment growth rate compared to the previous year is always positive. These data indicate a positive employment trend for the sector, which in 2018 consolidates the upward trend compared to the first year under consideration. As regards employment at macro-regional level, in 2018 higher growth rates are recorded in Germany (+8.0% compared to 2011), Slovenia (+4.3% compared to 2011) and Austria (+4.2% compared to 2011). In 2018, however, the employment picture worsens in the remaining EUSALP macro-areas: compared to 2011, employment in the sector falls by -0.9% in Italy, -5.5% in Switzerland and -5.9% in France. With the exception of the French regions, the annual growth rate of employment in the sector shows an irregular trend: positive values, but still less than 5% in 2011, then decreasing values in 2015 up to a maximum decrease of about -3%. In 2018, however, there is a return to higher annual growth rates of between 2 and 10%.

EMPLOYMENT GROWTH RATE 2011-2018

At regional level, the regions showing strong employment growth between 2011 and 2018 are Oberpfalz, Provence-Alpes-Côte d'Azur, Unterfranken and Burgenland with rates above 30%. In contrast, the regions showing a markedly negative change over the same period (with rates of decline of more than 40%) are the Italian regions of the Autonomous Province of Bolzano and Valle d'Aosta, the Austrian region of Salzburg and the French region of Auvergne.

Oberpfalz
Provence-Alpes-Côte d'Azur
Unterfranken
Burgenland (AT)
Mittelfranken
Oberfranken
Tirol
Franche-Comté
Provincia Autonoma di Trento
Vorarlberg
Steiermark
Oberösterreich
Oberbayern
Zahodna Slovenija
Tübingen
Stuttgart
GERMANY (EUSALP)
Niederösterreich
SLOVENIA
Veneto
AUSTRIA
Friuli-Venezia Giulia
Piemonte
Schwaben
Vzhodna Slovenija
ITALY (EUSALP)
Lombardia
Niederbayern
Kärnten
Freiburg
SWITZERLAND
Karlsruhe
FRANCE (EUSALP)
Liguria
Rhône-Alpes
Wien
Bourgogne
Provincia Autonoma di Bolzano
Valle d'Aosta
Salzburg
Auvergne

-60 -50 -40 -30 -20 -10 0 10 20 30 40

EMPLOYMENT GROWTH RATE 2011-2018

Map regions (labels): Oberfranken, Unterfranken, Mittelfranken, Oberpfalz, Stuttgart, Karlsruhe, Niederbayern, Niederösterreich, Wien, Freiburg, Tübingen, Schwaben, Oberbayern, Oberösterreich, Burgenland, Bourgogne, Franche-Comté, Vorarlberg, Tirol, Salzburg, Steiermark, Schweiz/Suisse/Svizzera, Tirol, Kärnten, Bolzano, Vzhodna Slovenija, Auvergne, Rhône-Alpes, Valle d'Aosta, Lombardia, Trento, Veneto, Friuli-Venezia Giulia, Piemonte, Liguria, Provence-Alpes-Côte d'Azur

WOOD

Between 2011 and 2018, employment in the wood sector increased in some regions, but with lower growth rates than in the other sectors considered. Overall, employment in the EUSALP area decreased by -5.9%. In 2018, the regions that are bucking the EUSALP average and therefore have a positive employment growth rate are Slovenia (+7.4% compared to 2011), Germany (+3.0% compared to 2011) and Switzerland (+2.3% compared to 2011). In the Austrian, French and Italian regions, employment in the sector is decreasing: in particular, employment in the Italian regions is down by -27.3%, with Lombardy (-27.4%) and Veneto (-34.6%) being the worst affected. As regards these regions, the rate of decrease is also confirmed by the annual rates of change of employment, which in all the years considered register negative values. On the other hand, in the average of the EUSALP area, 2018 shows a reversal of the downward trend, with an increase in employment of +0.7% compared to 2017. As the map clearly shows, employment in the wood sector is gradually decreasing in the southern part of the EUSALP area, while it is increasing in Slovenia and the northern part.

EMPLOYMENT GROWTH RATE 2011-2018

At regional level, the regions showing strong growth in the employment factor between 2011 and 2018 are Bourgogne and Niederbayern with a growth rate of more than 15%. On the other hand, the regions showing a strong decrease in employment are the Italian regions (except Liguria), the French regions of Provence-Alpes-Côte d'Azur and Franche-Comté and the Austrian region of Burgenland with a decrease of more than -20%.

Bar chart — EMPLOYMENT GROWTH RATE 2011-2018 (WOOD), categories top to bottom:
Bourgogne, Niederbayern, Mittelfranken, Zahodna Slovenija, Oberpfalz, Schwaben, Oberfranken, Tirol, SLOVENIA, Vorarlberg, Vzhodna Slovenija, Oberbayern, GERMANY (EUSALP), Unterfranken, SWITZERLAND, Freiburg, Niederösterreich, Karlsruhe, Tübingen, AUSTRIA, Salzburg, Steiermark, Oberösterreich, Kärnten, FRANCE (EUSALP), Rhône-Alpes, Auvergne, Liguria, Stuttgart, Provincia Autonoma di Trento, Wien, Friuli-Venezia Giulia, Provence-Alpes-Côte d'Azur, Provincia Autonoma di Bolzano, Burgenland (AT), Franche-Comté, Valle d'Aosta, Piemonte, ITALY (EUSALP), Lombardia, Veneto

X-axis: -35, -30, -25, -20, -15, -10, -5, 0, 5, 10, 15, 20, 25

MECHANICS AND MECHATRO-NICS

Over the period 2011-2018, employment in the mechanical engineering sector has lower rates of change, both positive and negative, than the other sectors considered. On average, employment in the EUSALP area grows by +7.0%. Overall, the Italian regions show stability in employment, while the German, Slovenian and Austrian regions on average see employment in the sector grow by +10%. Observation of the annual rates of change in employment shows a behaviour common to all the regions considered: in 2011 the annual rate of change registers a contained variation, which however tends to worsen in 2015 before returning to growth in 2018. On average, all the macro-areas considered show an annual rate of change that is higher and positive than that of 2011, with the exception of the Swiss regions, whose annual growth rate of employment in 2018 is positive, but lower than that of 2011. The map clearly shows a vertical distribution of the employment growth rate: the eastern regions of the EUSALP area show positive growth rates, while those to the west, with the exception of Provence, show negative rates.

EMPLOYMENT GROWTH RATE 2011-2018

In general, there is an increase in employment in the majority of EUSALP regions (there are only nine regions where employment declines). At regional level, employment growth rates in the mechanical engineering sector of more than +20% were recorded in the Austrian regions of Tirol and Vorarlberg in the period 2011-2018. Employment growth rates of more than 10% were recorded in the French regions of Bourgogne and Franche-Comté, in the Italian regions of Liguria and Valle d'Aosta and in the Austrian region of Vienna.

Tirol
Vorarlberg
Niederbayern
Schwaben
Oberösterreich
Salzburg
Tübingen
Zahodna Slovenija
Oberpfalz
Provincia Autonoma di Bolzano
Steiermark
AUSTRIA
SLOVENIA
Stuttgart
Oberfranken
Niederösterreich
Freiburg
Burgenland (AT)
Oberbayern
Provence-Alpes-Côte d'Azur
GERMANY (EUSALP)
Vzhodna Slovenija
Friuli-Venezia Giulia
Veneto
Mittelfranken
Provincia Autonoma di Trento
Kärnten
Karlsruhe
Unterfranken
ITALY (EUSALP)
Piemonte
Rhône-Alpes
Lombardia
FRANCE (EUSALP)
SWITZERLAND
Auvergne
Franche-Comté
Liguria
Wien
Valle d'Aosta
Bourgogne

-25 -20 -15 -10 -5 0 5 10 15 20 25 30

PLASTIC

▲▲▲▲▲▲

In the period 2011-2018, employment in the plastics sector increases on average by 5.5%. Employment in the Slovenian regions shows higher growth rates than in the EUSALP area (+20%), followed by the German (+8.9%) and Austrian (+7.6%) regions. On average, the Italian regions show a substantial stability of employment in the period considered (+1.2%). On average, employment in the plastics sector fell in the Swiss regions (-5.3%) and even more sharply in the French regions (-15.4%). In particular, the French regions show a positive annual growth rate of employment only in 2011, which becomes negative in 2015 and 2018. On the other hand, as regards the other regions, the annual growth rates of employment show a sharp drop in 2015, but immediately recover with positive values in 2018. Observation of the map shows a downward trend in the central parts of the EUSALP area, while employment growth occurs in the southern (Slovenia, Italy and Provence) and northern (Germany and Northern Austria) parts.

*EMPLOYMENT
GROWTH RATE
2011-2018*

At regional level, rather low rates of change in employment are recorded. Between 2011 and 2018, employment in the plastics sector shows very high growth in Valle d'Aosta, followed by the German regions of Tübingen and Freiburg, Vzhodna Slovenija and the Austrian region of Vorarlberg with growth rates above 20%. On the other hand, the French regions of Bourgogne, Rhône-Alpes and Franche-Comté have seen employment in the sector fall by more than 30%. In general, most regions in the EUSALP area show positive rates of change.

SOCIO-ECONOMIC INDICATORS OF THE ALPINE SPACE

INDICATOR 5

Numerator: **total amount of labour costs**
Denominator: **total amount of value added produced**

INDICATOR 6

Numerator: **number of employees**
Denominator: **total amount of value added produced**

Indicator 5 compares labour costs in the manufacturing sector and its different sectors with the value added produced by the various economic activities. The indicator thus contributes to understanding how value added is used and distributed for the remuneration of the labour factor and the trends that characterise the various sectors and regions of the Alpine Space. This is an indicator of primary importance for outlining the development trend of manufacturing activities in the territory and for highlighting certain structural characteristics of specific manufacturing sectors. In this case, when we use values for the whole country, we consider all the regions of the country and not only those that are part of the Alpine Space.

Indicator 6 aims to show the number of employees needed to produce one unit of value added (€1 million). The calculation method used is to relate the number of employees to the total amount of value added produced in the manufacturing sector. The indicator allows us to work out the labour intensity, i.e. the amount of labour relative to value added used in the various economic activities.

Stuttgart **72.577,17**

Tübingen **25.539,92**

Karlsruhe **39.415,97**

Freiburg **24.290,34**

Franche-Comté **5.388,03**

Bourgogne **5.600,09**

Schwaben **19.784,86**

Auvergne **5.795,56**

Switzerland **112.131**

Valle d'Aosta **315.5**

Rhône-Alpes **31.370,12**

Provence-Alpes-Côte d'Azur **12.492,01**

Piemonte **4.764,8**

Oberfranken **9.921,51**

Oberpfalz **13.412,34**

Niederbayern **12.788,37**

Oberbayern **55.840,46**

Mittelfranken **18.877,99**

Wien **6.279**

Niederösterreich **10.541**

Oberösterreich **17.823**

Burgenland **1.163**

Salzburg **4.194**

Kärnten **4.215**

Bolzano **2.653,3**

Zahodna Slovenija **5.133,12**

Vzhodna Slovenija **4.178,55**

Friuli-Venezia Giulia **7.649,2**

Veneto **37.064,4**

Trento **2.386,7**

Tirol **5.532**

Lombardia **72.457,7**

Vorarlberg **4.639**

Liguria **1.556.981**

Map labels: Unterfranken, Oberfranken, Mittelfranken, Oberpfalz, Karlsruhe, Stuttgart, Niederbayern, Niederösterreich, Wien, Freiburg, Tübingen, Schwaben, Oberbayern, Oberösterreich, Burgenland, Bourgogne, Franche-Comté, Vorarlberg, Tirol, Salzburg, Steiermark, Schweiz/Suisse/Svizzera, Provincia Autonoma di Bolzano/Bozen, Kärnten, Auvergne, Valle d'Aosta/Vallée d'Aoste, Provincia Autonoma di Trento, Friuli-Venezia Giulia, Vzhodna Slovenija, Rhône-Alpes, Piemonte, Lombardia, Veneto, Zahodna Slovenija, Liguria, Provence-Alpes-Côte d'Azur

VALUE ADDED IN THE MANUFACTURING SECTOR
2018

Oberfranken
Unterfranken
Oberpfalz
Mittelfranken
Stuttgart
Karlsruhe
Niederbayern
Niederösterreich
Wien
Freiburg
Tübingen
Schwaben
Oberbayern
Oberösterreich
Bourgogne
Franche-Comté
Vorarlberg
Tirol
Salzburg
Steiermark
Burgenland
Schweiz/Suisse/Svizzera
Tirol
Kärnten
Auvergne
Rhône-Alpes
Valle d'Aosta
Bolzano
Vzhodna Slovenija
Trento
Friuli-Venezia Giulia
Veneto
Lombardia
Piemonte
Liguria
Provence-Alpes-Côte d'Azur

MANU-FACTORY

▲▲▲▲▲▲▲

How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

The map shows, through darker colours, a higher percentage of the added value distributed to the labour factor in the manufacturing sector in the German, Slovenian and Swiss regions. On average, in 2018, 53.5% of the added value of manufacturing companies in the EUSALP regions in Germany is distributed to the labour factor, 49.8% in Slovenia and 48.1% in Switzerland. In the average of the EUSALP regions, slightly less than half of the value added produced in manufacturing is used to remunerate the labour factor (46.6%). Manufacturing enterprises in the Austrian, French and Italian regions are below the average for the Alpine area. In Austria, 44.9% of the added value produced by manufacturing enterprises is used to cover labour costs, 40.1% in France and 39.2% in Italy. There is therefore a difference of 12.3 percentage points between the value added/labour costs of the German and Italian regions. The German regions of Oberfranken, Schwaben, Mittelfranken and Oberpfalz have a share of the indicator of more than 55% in 2018; in contrast, the French regions of Franche-Comté and Bourgogne are among the manufacturing companies

employing less than 35% for the remuneration of the labour factor. All manufacturing enterprises in the Italian regions in the EUSALP area, with the exception of the Province of Bolzano, spend less than 40% of their value added on wages and salaries.

GERMANY - EUSALP

Stuttgart 48%
Karlsruhe 52%
Freiburg 54.5%
Tübingen 51.9%
Ober-bayern 47.1%
Oberfranken 57.5%
Mittelfranken 57%
Nieder bayern 53.4%
Unterfranken 54.4%
Schwaben 57.4%
Oberpfalz 55.4%

FRANCE - EUSALP

Bourgogne 31.4%
Franche-Comté 34.4%
Auvergne 42.9%
Rhône-Alpes 43%
Provence-Alpes-Côte d'Azur 38%

ITALY - EUSALP

Piemonte 39.5%
Valle d'Aosta 37.2%
Liguria 36.6%
Lombardia 38.9%
Bolzano 41.8%
Trento 38.6%
Veneto 39.4%
Friuli-Venezia Giulia 40.6%

SLOVENIA

Vzhodna Slovenija 51.7%
Zahodna Slovenija 47.9%

AUSTRIA

Burgenland 47.4%
Niederösterreich 44.7%
Wien 45.3%
Kärnten 38.5%
Steiermark 48.6%
Oberösterreich 45.7%
Salzburg 37.6%
Tirol 43%
Vorarlberg 47.3%

SWITZERLAND

Switzerland 48.1%

REGIONAL AND NATIONAL VA DISTRIBUTED TO LABOUR 2011 - 2015 - 2018

Legend: 2011 | 2015 | 2018

Region	2011	2015	2018
Stuttgart	47.4%	45.6%	48.0%
Karlsruhe	53.2%	53.0%	52.0%
Freiburg	52.7%	53.1%	54.5%
Tübingen	49.9%	52.4%	51.9%
Oberbayern	42.7%	43.0%	47.1%
Niederbayern	46.6%	49.2%	53.4%
Oberpfalz	49.4%	52.4%	55.4%
Oberfranken	56.6%	53.9%	57.5%
Mittelfranken	56.7%	58.4%	57.0%
Unterfranken	55.6%	58.3%	54.4%
Schwaben	55.3%	54.8%	57.4%
Bourgogne	39.2%	37.7%	31.4%
Franche-Comté	31.4%	33.4%	34.4%
Auvergne	43.1%	41.1%	42.9%
Rhône-Alpes	43.0%	45.5%	43.0%
Provence-Alpes-Côte d'Azur	37.5%	36.5%	38.0%
Piemonte	42.1%	41.4%	39.5%
Valle d'Aosta	43.7%	41.6%	37.2%
Liguria	41.0%	39.3%	36.6%
Lombardia	39.4%	40.0%	38.9%
Provincia Autonoma di Bolzano	42.4%	41.5%	41.8%
Provincia Autonoma di Trento	39.0%	40.5%	38.6%
Veneto	40.3%	40.2%	39.4%
Friuli-Venezia Giulia	40.1%	41.6%	40.6%
Burgenland	44.7%	47.1%	47.4%
Niederösterreich	47.4%	45.7%	44.7%
Wien	50.1%	48.9%	45.3%
Kärnten	42.5%	44.3%	38.5%
Steiermark	45.5%	47.6%	48.6%
Oberösterreich	44.3%	46.6%	45.7%
Salzburg	41.9%	40.0%	37.6%
Tirol	43.1%	42.4%	43.0%
Vorarlberg	42.5%	44.2%	47.3%
Vzhodna Slovenija	49.0%	51.7%	
Zahodna Slovenija	47.8%	47.9%	
Switzerland	50.0%	51.1%	48.1%

GERMANY — 49.6% | 49.6% | 51.5%

	2011	2015	2018
CHEMISTRY	47.0%	49.5%	50.1%
WOOD	55.7%	57.6%	54.3%
MECHANICS	59.5%	62.5%	61.2%
PLASTIC	58.8%	62.2%	61.5%

FRANCE — 40.4% | 41.3% | 40.1%

	2011	2015	2018
CHEMISTRY	43.5%	40.5%	45.5%
WOOD	58.1%	60.3%	56.0%
MECHANICS	57.9%	55.1%	55.3%
PLASTIC	54.9%	54.1%	52.0%

ITALY — 40.2% | 40.4% | 39.2%

	2011	2015	2018
CHEMISTRY	41.3%	37.9%	36.1%
WOOD	44.8%	43.4%	41.0%
MECHANICS	47.3%	46.8%	44.3%
PLASTIC	46.0%	43.5%	41.3%

AUSTRIA — 45.1% | 45.8% | 44.9%

	2011	2015	2018
CHEMISTRY	38.0%	37.4%	38.0%
WOOD	47.8%	49.5%	45.5%
MECHANICS	49.4%	53.3%	52.3%
PLASTIC	49.1%	55.8%	56.4%

SLOVENIA — 48.5% | 50.0% |

	2011	2015	2018
CHEMISTRY	43.8%	43.4%	44.8%
WOOD	63.4%	51.5%	49.7%
MECHANICS	56.3%	55.2%	56.0%
PLASTIC	57.8%	53.8%	55.0%

SWITZERLAND — 50.0% | 51.1% | 48.1%

	2011	2015	2018
CHEMISTRY	57.1%	53.9%	
WOOD	64.9%	67.4%	67.2%
MECHANICS	55.5%	58.5%	55.8%
PLASTIC	58.8%	64.1%	61.7%

euro unit) and Liguria (12.4 employees). In relation to indicator 5, despite the fact that in Slovenia almost 50% of added value is spent on labour factor wages, the productivity of employees in this region remains low (in relation to other Alpine regions).

MANU-FACTORY

▲▲▲▲▲▲▲▲▲

How to read these data visualizations

The **size of each square** depends on the size of the indicator: a larger square corresponds to a higher indicator value.
The **colour** of each square corresponds to the colour of each region in the map.
The **intensity of the colour** changes depending on the size of the indicator: a darker colour corresponds to a higher value of the indicator.

Regarding the manufacturing sector, 10.4 employees are employed in the EUSALP area in 2018 for the production of one unit of million of added value. Above the EUSALP average, thus with a higher number of employees needed for the production of value added, are the French regions (10.8 employees per unit of million) the Italian regions (13.2 employees) and the Slovenian regions (22.9 employees). In contrast, in the Austrian, German and Swiss regions, the ratio of employed persons to value added is lower: less than 9 employed persons per unit of million in manufacturing enterprises in the Swiss regions (6.56 employed persons per unit of million), the German regions of Oberbayern and Stuttgart (7.6 and 8.3 employed persons respectively) and the Austrian regions Kärnten and the city region of Vienna (8.9 employed persons). A lower value of the indicator corresponds to a higher productivity of employees in manufacturing activities. The map clearly shows the prevalence of higher values of the indicator in the southern Alpine regions: among the Italian regions with the highest productivity of employees are Lombardy (12.5 employees per million

GERMANY - EUSALP

Stuttgart 8.3	Ober-bayern 7.58	Nieder-bayern 11.91	Oberpfalz 11.83	Bourgo-gne 9.48	Franche-Comté 10.08
Karlsruhe 10.22					
Freiburg 11.86	Oberfranken 14.14	Unter-franken 11.72	Schwa-ben 12.19	Auvergne 11.45	Rhône-Alpes 11.12
Tübingen 10.49	Mittelfranken 11.49			Provence-Alpes-Côte d'Azur 10.48	

FRANCE - EUSALP

ITALY - EUSALP

Piemonte 13.28	Lombardia 12.45	Veneto 14.32	Vzhodna Slovenija 24.44
Valle d'Aosta 14.97	Bolzano 13.43		
		Friuli-Venezia G 13.78	
Liguria 12.41	Trento 13.79		Zahodna Slovenija 21

AUSTRIA

Burgenland 13.39	Kärnten 8.88	Salzburg 9.31	Tirol 9.94
	Steiermark 10.77		
Niederösterreich 10.44			
Wien 8.96	Oberösterreich 9.95	Vorarlberg 10.17	Switzerland 6.56

SLOVENIA

REGIONAL AND NATIONAL EMPLOYMENT PRODUCTIVITY 2011 - 2015 - 2018

Legend: 2011 | 2015 | 2018

Region	2011	2015	2018
Stuttgart	10.15	8.58	8.30
Karlsruhe	12.31	11.08	10.22
Freiburg	13.55	12.36	11.86
Tübingen	12.08	11.34	10.49
Oberbayern	8.40	7.41	7.58
Niederbayern	12.48	11.79	11.91
Oberpfalz	12.76	12.07	11.83
Oberfranken	16.79	14.49	14.14
Mittelfranken	13.70	12.63	11.49
Unterfranken	14.32	13.62	11.72
Schwaben	14.10	12.42	12.19
Bourgogne	12.74	11.67	9.48
Franche-Comté	10.63	10.47	10.08
Auvergne	14.14	11.90	11.45
Rhône-Alpes	12.74	12.14	11.12
Provence-Alpes-Côte d'Azur	12.04	9.63	10.48
Piemonte	16.72	14.73	13.28
Valle d'Aosta	19.71	17.03	14.97
Liguria	15.99	14.13	12.41
Lombardia	14.75	13.53	12.45
Provincia Autonoma di Bolzano	16.03	14.16	13.43
Provincia Autonoma di Trento	15.84	15.09	13.79
Veneto	17.06	15.57	14.32
Friuli-Venezia Giulia	16.02	15.16	13.78
Burgenland	15.10	14.39	13.39
Niederösterreich	12.96	11.31	10.44
Wien	10.61	9.93	8.96
Kärnten	11.97	11.04	8.88
Steiermark	11.74	11.21	10.77
Oberösterreich	11.31	10.77	9.95
Salzburg	11.95	10.33	9.31
Tirol	12.13	10.51	9.94
Vorarlberg	10.94	10.11	10.17
Vzhodna Slovenija	26.16		24.44
Zahodna Slovenija	22.68		21.00
Switzerland	7.75	6.63	6.56

Country / Sector	2011	2015	2018
GERMANY	11.62	10.34	9.97
CHEMISTRY	9.04	8.40	8.40
WOOD	22.15	21.38	18.72
MECHANICS	13.40	12.54	11.53
PLASTIC	17.19	16.45	15.28
FRANCE	12.52	11.39	10.77
CHEMISTRY	9.97	8.83	8.90
WOOD	22.40	21.64	19.24
MECHANICS	15.51	13.58	13.39
PLASTIC	17.11	15.23	13.47
ITALY	15.77	14.36	13.15
CHEMISTRY	11.82	9.97	9.10
WOOD	32.25	30.07	25.89
MECHANICS	17.89	16.17	14.53
PLASTIC	17.66	15.31	13.84
AUSTRIA	11.76	10.83	10.04
CHEMISTRY	7.30	6.59	6.47
WOOD	16.40	15.14	12.65
MECHANICS	11.37	11.26	10.39
PLASTIC	13.67	13.86	12.94
SLOVENIA	24.61		22.89
CHEMISTRY	19.15	18.68	17.59
WOOD	48.78	38.19	32.48
MECHANICS	30.88	27.64	25.10
PLASTIC	31.35	26.33	24.70
SWITZERLAND	7.75	6.63	6.56
CHEMISTRY	6.95	5.46	
WOOD	12.76	11.33	12.12
MECHANICS	8.69	7.52	7.61
PLASTIC	10.03	8.96	9.31

*NATIONAL VA
DISTRIBUTED
TO LABOUR
SECTOR-SPECIFIC
2011 - 2015 - 2018*

*see the graph at
page 89*

At sectoral level, the first fact we can observe common to all regions is the higher percentage of added value used in the remuneration of the labour factor in all four sectors considered compared to the average for manufacturing. As regards the chemical sector, in the three years under consideration, the percentages in the various countries exceed 50% only in Switzerland, while in the other countries they are around 40% (lowest in Austria). Moreover, Italian companies are the only ones to show a negative trend in the change of the indicator over the period 2011-2018. The wood sector shows higher percentages of the share of value added used in the remuneration of labour costs in France, Slovenia and Switzerland than the other manufacturing sectors. With the exception of the Italian and Slovenian companies that show a negative trend in the change of the breakdown in all the years considered, a discontinuous trend is observed in the companies of the other EUSALP regions with an increase in the percentage in 2015 and a subsequent decrease in 2018. In Germany, Italy and Austria, the mechatronics sector is the one with the highest percentages of value added used for wages and salaries: on the one hand, companies in Germany and Austria in the period 2011-2018 stabilise the ratio of value produced to labour costs, on the other hand, Italian companies see a decrease in the share of value used for labour costs. In particular, the downward trend in the value added/ labour cost share for Italian companies affects all the manufacturing sectors analysed indifferently. As regards the plastics sector, companies employ more than 60% of the value produced for the labour factor in Germany and Switzerland: in particular, in Germany, the share of the plastics sector in 2018 exceeds that of the mechanical sector.

*NATIONAL
EMPLOYMENT
PRODUCTIVITY
SECTOR-SPECIFIC
2011 - 2015 - 2018*

*see the graph at
page 93*

At the sector level, the wood sector has a higher value of the indicator in all EUSALP countries: for the production of one unit of added value, more people are employed than in other sectors, especially in Italy and Slovenia. Overall, between 2011 and 2018, there is an increase in the productivity of employees: in fact, the share of employees employed to produce one unit of added value decreases in all the sectors considered. With regard to the chemicals sector, all countries show a higher productivity of employees compared to the manufacturing sector, but also compared to the other three sectors highlighted in the study. In France, Italy and Slovenia the productivity levels of those employed in the mechanical engineering sector and in the plastics sector are very similar, while in Germany, Austria and Switzerland the productivity of those employed in the mechanical engineering sector is higher than in the plastics sector. On a comparative level, the graph clearly shows that the productivity of employees in manufacturing and in the four sectors is higher for Switzerland than for the other Alpine countries. In contrast, Slovenia and Italy have lower levels of labour productivity in terms of added value than the other countries considered.

SOCIO-ECONOMIC INDICATORS OF THE ALPINE SPACE

APPLICATION OF THE REGIONAL INNOVATION INDEX IN THE ALPINE REGION

The Regional Innovation Scoreboard (RIS) is a regional extension of the European Innovation Scoreboard (EIS), which assesses the innovation performance of European regions on a limited number of indicators. The RIS 2021 provides a comparative assessment of the performance of innovation systems in 240 regions in 22 EU countries. Average innovation performance is measured using composite indicators. The Regional Innovation Index (RII) is calculated as the unweighted average of the normalised scores of the 21 RIS indicators, including: R&D expenditure in the public sector, R&D expenditure in the business sector, non-R&D innovation expenditure, innovation expenditure per person employed, ICT specialists employed in enterprises, SMEs introducing product innovations, SMEs introducing innovations in business processes, innovative SMEs collaborating with others, employment in innovative enterprises and others.In general, the indicators refer to a scoreboard consisting of four elements: baseline conditions, investments, innovative activities and impacts. R&D expenditure is one of the main drivers of economic growth in a knowledge-based economy. Indeed, trends in R&D expenditure provide key indications of a region's future competitiveness and wealth. R&D expenditure is essential for making the transition to a knowledge-based economy, as well as for improving production technologies and stimulating growth. Moreover, the degree to which complex innovations can be developed also depends on the ability of firms to draw on different sources of information and knowledge, or to collaborate in the development of an innovation. Attention is therefore drawn to the importance of the flow of knowledge between public research institutions and companies, and between companies and other companies. European regions are grouped into four innovation performance clusters according to the ranking of their own innovation index compared to that of the EU. There are four relative performance thresholds (the same as those used in the EIS):

- Innovation leaders: regions performing above 125% of the EU average;
- Strong Innovators: regions performing between 100% and 125% of the EU average;
- Moderate Innovators: regions performing between 70% and 100% of the EU average;
- Emerging Innovators: regions performing below 70% of the EU average.

In 2021, in the total EUSALP area 13 regions are part of

INNOVATION LEADER

Stuttgart 129,6
GERMANY
Karlsruhe 144,0
GERMANY
Freiburg 126,0
GERMANY
Tübingen 134,7
GERMANY
Oberbayern 151,1
GERMANY
Mittelfranken 128,5
GERMANY
Région lémanique 133,6
SWITZERLAND
Espace Mittelland 129,4
SWITZERLAND
Nordwestschweiz 138,1
SWITZERLAND
Zürich 146,4
SWITZERLAND
Ostschweiz 133,8
SWITZERLAND
Zentralschweiz 136,0
SWITZERLAND
Ticino 142,7
SWITZERLAND

STRONG INNOVATOR

Oberpfalz 115,9
GERMANY
Oberfranken 111,1
GERMANY
Unterfranken 119,9
GERMANY
Schwaben 107,8
GERMANY
Auvergne-Rhône-Alpes 116,0
FRANCE
Provence-Alpes-Côte d'Azur 104,9
FRANCE
Lombardia 102,3
ITALY
Trento 107,1
ITALY
Veneto 102,8
ITALY
Friuli-Venezia Giulia 106,6
ITALY
Ostösterreich 121,1
AUSTRIA
Südösterreich 116,8
AUSTRIA
Westösterreich 115,1
AUSTRIA

MODERATE INNOVATOR

Niederbayern 98,2
GERMANY
Bourgogne - Franche-Comté 89,6
FRANCE
Piemonte 97,8
ITALY
Liguria 88,3
ITALY
Bolzano 94,8
ITALY
Vzhodna Slovenija 79,8
SLOVENIA
Zahodna Slovenija 98,1
SLOVENIA

EMERGING INNOVATOR

Valle d'Aosta 67,4
ITALY

the Innovation Leaders group, 13 regions of the Strong Innovators group, 7 regions are Moderate Innovators and only one region is an Emerging Innovator. In the Innovation Leaders group there are only German and Swiss regions (in particular, all Swiss regions), i.e. in 2021, compared to the EU27 average, these regions are at least 125% better positioned. On average, the EUSALP area can be considered as Strong Innovators (131.3 the index value), thus with a better innovation performance than the average of the other European regions. In the group of Strong Innovators the best performances are those of the Ostösterreich region (121.1) for Austria, Auvergne - Rhône-Alpes (116.0) for France and the Autonomous Province of Trento (107.1) for Italy. Below the average EU27 performance are the regions considered Moderate Innovators, including, with the worst performances, the regions of Niederbayern (98.2) for Germany, Vzhodna Slovenija (79.8) for Slovenia (all the Slovenian regions fall into this group), Liguria (88.3) for Italy and Bourgogne-Franche-Comté (89.6) for France. The only region from the EUSALP area in the group of Emerging Innovators is Valle d'Aosta (67.4 index value). Looking at the change of the index in 2021 compared to 2014, all Italian Strong and Moderate Innovator regions and the Swiss region of Ticino are positioned with a growth rate above 20% (and higher than the EU27 average of 14.8%). Valle d'Aosta also has an innovation index growth rate close to the EU27 average. On average, the innovation index in EUSALP regions grows by +11.4%. For the Innovation leader regions a substantial flattening of the index growth is observed over the period. The only regions for which a worsening of the innovation index is observed are the Zurich region and Bourgogne - Franche-Comté.

CHANGE IN RII 2021 COMPARED TO THE EU AVERAGE (BASE YEAR 2014)
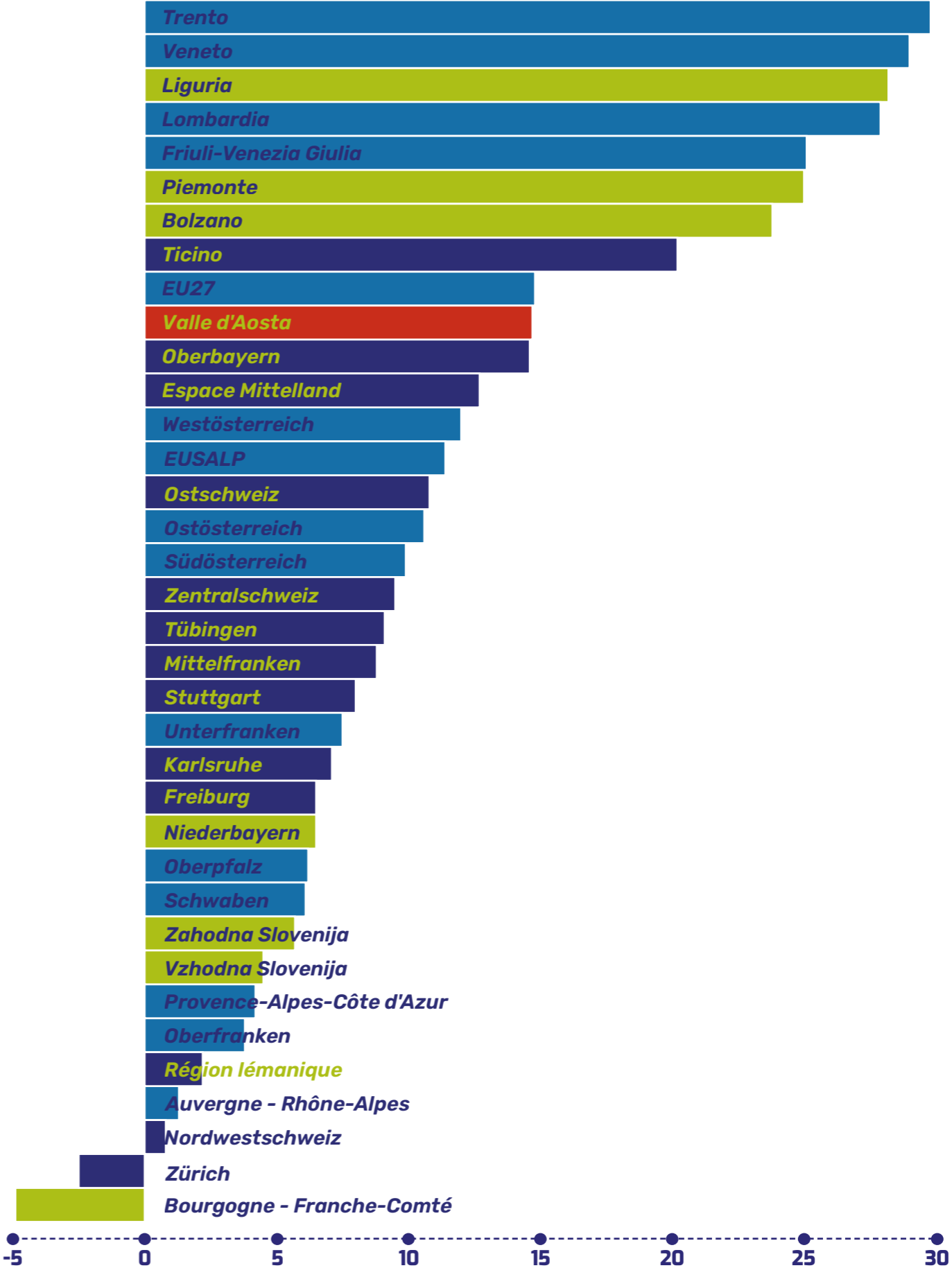
SOCIO-ECONOMIC INDICATORS OF THE ALPINE SPACE

VULNERABILITY MATRIX

The vulnerability matrix shown on the next page takes into account the two indicators concerning the production specialisation of the Alpine regions and the structure of the regional entrepreneurial fabric.

The "employment density" indicator, as we have already seen, returns the size, but also the spread, of employment in a given sector in a territory. The indicator thus offers the two dimensions of vulnerability and opportunity of the economic sectors under consideration: the productive specialisation of a region is in fact an important element for assessing the opportunities for resilience. It is clear that, in any given territory, a large number of people employed in a given sector of activity represents both a risk, in the event that that specific sector encounters a crisis of various kinds, and an opportunity, if one considers the reorganisation capacities of a well-structured production chain (human capital with sedimented skills, craft and industrial traditions).

The observation of firm size allows us to assess the correlated capacity of firms to restructure or reorganise in case of temporary shocks or persistent crises. As we have seen above, firm size varies considerably depending on the economic sector considered and the areas of the Alpine Space observed. Indeed, it is easy to see that firm size is not only an independent organisational variable, but rather a result of various factors, including a specific organisational culture of economic units at regional (or rather national) level. In the context of entrepreneurial resilience, company size is therefore an important assessment factor because it takes into account (and tries to synthesise) various factors: the presence of different business units and functions capable of jointly responding to shocks/crises, the ease of reorganising production processes, and access to and ability to manage financial support instruments.

In essence, the synthesis of the two indicators offers us an immediate overview (one of the many that can be imagined/developed) of the capacities/vulnerability of businesses in the Alpine region in responding to the socio-economic changes affecting the territory. Furthermore, the choice of offering such a representation of resilience responds to the need to produce a representation that is as detailed as possible at a geographical and sectoral level.

CALCULATION METHOD:

The vulnerability matrix was constructed by reworking indicators 2 and 3. For each indicator we calculated the distance of the regional value from the average of the EUSALP area and the variation of the indicator between 2011 and 2018. The colour variations return the first evaluation criterion (region-area EUSALP relationship), while the positive, negative and equal signs of variation represent the temporal dynamics within each region.
In order to understand how this is represented, an example calculation is given below.

Field: Chemistry

Average EUSALP indicator 2 in 2018:

31.0 jobs/10 thousand inhabitants

Value of indicator 2 for the region Karlsruhe in 2018: 37.9 employed/10 thousand inhabitants

Distance region/EUSALP average: +21.9%

Average EUSALP indicator 3 in 2018:

30.91 jobs/local unit

Value of indicator 3 for the region Karlsruhe in 2018: 41.4 jobs/local unit

Distance region/EUSALP average: +32,8%

As we have said, the vulnerability indicator presented in the matrix is a summary of the structure of enterprises and employment spread at regional level. The matrix's colour impact allows us to immediately assess the positioning of the different regions in relation to the average situation of the entire Alpine region. The regions in Germany, which are predominantly coloured blue or light blue, show values of the indicator that are higher than the average values of EUSALP area in all sectors taken into account: the companies are larger and there is a high proportion of workers employed in the various manufacturing activities. In particular, this condition is relevant in the mechatronics and woodworking industries (with the exception of the Oberfranken and Karlsruhe regions). Furthermore, looking at the time dynamics, between 2011 and 2018 the indicator strengthens in all sectors with a variation between 6 and 39%. The French and Italian regions present a similar situation: compared to the average of the Alpine regions, the two countries present much lower values of the vulnerability indicator (for France, with a better positioning in the plastics sector). Over the period considered, a worsening of the indicator is observed for all sectors of activity in the French regions and a substantial stagnation of the indicator for the Italian regions (the wood sector in Italy, however, shows a worsening). In particular, the chemicals sector in France sees a sharp deterioration in the indicator between 2011 and 2018 in the Auvergne and Rhône-Alpes regions. The only counter-trend exception in the French manufacturing sector as a whole is the plastics sector in the Auvergne region. Some Italian regions show values above the average for the Alpine region in two sectors in particular: production of chemical materials and wood. As regards the first sector, Lombardy and the Autonomous Province of Trento show an indicator value that is on average better than the average of the other regions considered; the same applies to the Autonomous Provinces of Trento and Bolzano and the Friuli Venezia Giulia region in the wood sector. In this last sector, however, a widespread worsening of the vulnerability indicator can be seen between 2011 and 2018. As regards the other two sectors considered, mechanics and plastics, the only two regions with values close to the average EUSALP values are Friuli Venezia Giulia for mechanical manufacturing and Piedmont for plastics manufacturing. The Austrian and Slovenian regions present a very uneven situation depending both on the sector of economic activity observed and on the regions considered. Specifically, for the Austrian

regions, the indicator shows a strong vulnerability in the chemical sector in all regions (with the exception of the Oberösterreich region), while a strong structuring of the wood sector is observed in all regions (except Wien). As regards the mechanical engineering and plastics sectors, the situation between the different regions is very different: very good performances of the indicator are observed for the mechanical engineering sector in the Steiermark, Oberösterreich and Vorarlberg regions, for the plastics sector in the Burgenland, Oberösterreich and Vorarlberg regions. As regards the two Slovenian regions, the vulnerability indicator shows a situation in line with the EUSALP area in the chemical sector, while better results are observed in the wood and plastic sectors for Vzhodna Slovenija. Despite the fact that Zahodna Slovenija has a vulnerability indicator that performs worse than the average for the Alpine region in three sectors, it is important to emphasise that these performances show an improving trend over the period under consideration (in general, the situation is more stationary for the wood and chemical sectors). Observation of the indicator in the Swiss regions gives us a picture of a clear position above the EUSALP average for the first three sectors, which softens for the plastics sector. A worsening of the vulnerability indicator can be observed between 2011 and 2018: the temporal evolution indicates the ongoing reorganisation of the various manufacturing sectors.

OVERVIEW CONSIDERATIONS OF THE INDICATORS

The indicators presented in the previous pages illustrate multiple dimensions of the social, employment and entrepreneurial fabric of the Alpine Space. The intention is to offer a complex snapshot of the current state and the dynamics characterising the area's social organisations, in order to outline the main vulnerabilities and elements of opportunity that decision-makers must take into account in order to propose better programming to support development, also through the exploitation of synergies that develop transversally (between sectors and between regions). The cartographic representations clearly illustrate the ability of the indicators to cross regional borders, highlighting common phenomena affecting different countries. The first two indicators do not provide a clear representation of weakness, but help us to understand the productive specialisation of the different territories. These two indicators should be read together, because the concentration of enterprises (Ind1) may depend strongly on their fragmentation (enterprises with few employees). In this case, the second indicator comes to our rescue in reading the specialisation figure by relating the number of employees to the number of resident population. Indicator 3 then reconstructs the company size and clearly shows the existence of different entrepreneurial cultures between countries: in general, companies operating in the northern belt of the Space (Germany, Austria and Switzerland) are larger than those in the Mediterranean belt (France, Italy, Slovenia). This can be considered as a first rough indication of vulnerability degree as the size influences the company organisation and the availability of resources. As we will see later, also through the literature analysis and interviews with project SHs, the ability of a company to be resilient to the changes it encounters is strongly correlated to the availability of human resources in its organisation and the construction of a structure of functions and competences. The next indicator(4) adds another dimension to the reading: how is employment changing in the various regions? This observation is particularly interesting because it highlights two parallel dynamics: on the one hand, there are regions where employment is always growing regardless of the sector taken into consideration, while on the other hand we can observe a shift in employment between the different sectors (in this case, a more in-depth analysis would be needed to assess the dynamics of input and output of the employed, i.e. to understand whether the employed change sectors or leave/enter the labour market). Through the analysis of the last two indicators, we want to investigate the relationship between labour and added value: these two indicators help to understand how the various economic activities capitalise and remunerate the labour factor. As illustrated in the following pages of the report, the ability to innovate is another important factor that strengthens the resilience of enterprises through the development of competitiveness: the application of RIS to the regions of the Alpine region shows, on the one hand, the current robustness of the innovation and research system of some regions and, on the other hand, the effort that the regions lagging behind are making in this direction. Finally, the vulnerability matrix returns a complex and impactful indication of the main variables observed above: enterprises and workers.

RESILIENCE WITHIN EUSALP

DRIVERS AND TRENDS SUPPORTING RESILIENCE OF SMEs

We deal with business resilience in the aftermath of events that disrupt economies, which can be of various kinds, and which challenge the survival of economic activities. In the business context, resilience can be read as the ability of a business to "continuously adapt and grow in the face of turbulent change" (Fiksel 2006; Hamel and Valikangas 2003). In this sense, resilience embodies the ability and practice to withstand disruptions, which may arise from national and global trends, changes in the business ecosystem, but also from crises within the company itself. Therefore, it is not correct to think of the resilience of enterprises as their ability to survive persistent economic shocks, because this risks excluding a range of reorganisational activities that represent the living nature of productive organisations.

The following pages bring together important contributions from the scientific literature on the subject of the resilience of companies, particularly small and medium-sized ones, and the challenges posed by the pandemic crisis. Furthermore, the analysis of the areas of intervention proposed by the European Commission within the resilience dashboard helps us to highlight the transition megatrends affecting our societies.

The following scientific and literary evidence was reported following the analysis of these publications:

- Gregurec, I.; Tomičić Furjan, M.; Tomičić-Pupek, K. The Impact of COVID-19 on Sustainable Business Models in SMEs. Sustainability 2021, 13, 1098. https://doi.org/10.3390/su13031098
- Falciola, J.; Mohan, S.; Ramos, B.; Rollo, V. Identifying the drivers of SME resilience: a framework and index based on evidence from the COVID-19 pandemic. ITC Working Paper Series 2021, WP-01-2021.E.
- Alberti, F. G.; Ferrario, S.; Pizzurno, E. Resilience: resources and strategies of SMEs in a new theoretical framework. Int. J. Learning and Intellectual Capital, Vol. 15, No. 2, 2018.
- Wishart, M. Business resilience in an SME context: A literature review. Enterprise Research Centre.
- Hossam, S. I.; Poolton, J.; Sharifi, H. The role of agile strategic capabilities in achieving resilience in manufacturing-based small companies. International Journal of Production Research, 2011, 49:18, 5469-5487, https://doi.org/10.1080/00207543.2011.563833

- OECD. Global Value Chains: Efficiency and Risks in the Context of COVID-19, 2021.
- Cluster Intelligent Factories. Manufacturing a resilient Country, 2020.
- Maurer, F. Towards a Strategic Management Framework for Engineering of Organisational robustness and Resilience, 2020.

Companies were exposed to various challenges during the global pandemic and their response to this disruption had an impact on their resilience and their chances of overcoming the crisis. In particular, small and medium-sized enterprises have had to change their business models in order to evolve towards a new and uncertain economic environment. Small and medium-sized enterprises can very often be highly exposed to risk (with a high sensitivity to shocks), due, for example, to disruptions induced by international trade, the remote location of many small enterprises (a frequent condition for Alpine businesses), the resource scarcity endemic to SMEs, the lack of diversification of input sources and business outlets or the low number of employees.

The economic crisis unleashed by the spread of the COVID-19 pandemic is seen as an economic disruption of global proportions, at the same time seen as an opportunity or a challenge to transform one's business models and/or implement new technologies to support business processes. The creation of new strategic approaches, at a time when companies are necessarily grappling with internal availability of finance, resources and expertise, is an important contribution for SMEs in increasing their chances of overcoming the impact of the pandemic. Organisations, when attempting to reorganise their operating model, must consider three types of assumptions that influence the way they work:

assumptions related to the organisational environment, assumptions related to the fulfilment of the mission, and assumptions related to the competencies and resources that enable the fulfilment of the mission. However, this approach has to be rethought or modified when the organisation experiences great success or failure.

The COVID-19 pandemic has certainly exposed some flaws in current business models and consequently allowed companies to rethink these three fundamental assumptions. Within the framework of reorganisation strategies, transition approaches of production organisations have been defined, some of which relate to a highly unpredictable environment (such as that of the pandemic crisis. Companies can adopt an a. adaptive (followers), b. modelling (challengers) or c. renewal (total redefinition) approach:

- The "follower" SME decides to follow the way competitors in the same sector operate, focusing on a particular driver and implementing similar technologies;
- The "challenger" SME can benefit from filling the 'gaps' in the market (or competition) and differentiate itself by offering a value proposition that is different from the others: this value proposition may come from a different focus on drivers and/or the application of a technology that competitors have not yet considered;
- The "reinventing" SME could rethink their operational sector by identifying themselves in technological drivers and niches (also with the help of highly specialised skills and competences) not yet explored.

In this sense, with regard to the ability to quickly change business strategy, the structural flexibility of SMEs and their agility to respond can be considered an advantage over large companies. However, they often lack the skills and capabilities to take advantage of the

situation, so building capacity and skills for future growth opportunities should be a priority.

It is clear, therefore, how the pandemic crisis has motivated SMEs to rethink their core competencies, seek new opportunities and redefine sustainable business models in a more intensive and timely manner. Developing new skills and enhancing the experience of professionals already employed in the enterprise (including through recourse to the help of academia and public and private consultancy) appears to be an essential requirement for long-term regional development, both with regard to the application of new technologies and the adoption of new business models. In this way, SMEs will not just survive the disruption, but will be able to adopt new technologies and become more competitive in adverse conditions. In this sense, the COVID-19 crisis has made SMEs aware that investing in certain dimensions of business performance during good times determines their resilience during crises.

As we have seen, the impact of shocks on an economic activity is determined by multiple factors and decisions at the firm level on how to respond, whether to "resist" or "close". A firm's ability to "withstand" shocks is therefore a factor that determines its long-term performance. Research suggests that companies that manage to take advantage of a crisis situation are both resilient in the short term and more profitable in subsequent years (Torres, Marshall e Sydnor 2019). Business resilience is multidimensional in nature, i.e. determined by several factors that influence its performance under stress. The factors driving business resilience, proposed in multi-disciplinary conceptual frameworks, can be identified and categorised within three pillars: robustness, relatedness and responsiveness.

Robustness

This refers to the effectiveness of pre-event mitigation efforts in reducing initial shock factors affecting the probability of failure of critical infrastructure (Bruneau et al., 2003). Robust companies have robust management and operational procedures, which include buffers in their operations and enable them to withstand pressure during a crisis. Pre-crisis practices, such as the development of business plans, risk mitigation and business contingency plans, as well as the provision of strategic resources through inventory management and savings, increase robustness in the face of disruptions. Strong inventory management can influence companies' resilience to disruptions, creating room for manoeuvre in the system. As a result, companies with more effective inventory practices have a better perception of which input needs are most important in the short term. This capacity proved particularly valuable during COVID-19, when supply chains made access to production inputs more difficult. In this sense, advanced inventory/recording practices enable companies to identify reserves to draw on in the event of a crisis. In addition, good financial management influences how a company can respond to changes in the economic environment (an established and trusting relationship with financial institutions is key to facilitating better access to loans and other support that a bank can offer in times of crisis);

Relationship system

In the context of a company, internal and external relationships determine its strength in a crisis. Companies with stronger ties to other actors in the entrepreneurial ecosystem have a network of strong social capital that they can draw on to access resources and support during a crisis (Torres, Marshall e Sydnor 2019). Cooperation between companies in an industry to solve common day-to-day problems can help disseminate

information on the main challenges and their solutions (Williams et al. 2017). These links are often established through engagement in a business support organisation (e.g. clusters, international business networks). However, relationships must remain flexible to allow companies to adopt a personal response in the recovery process. Businesses with a diversified supply chain (a critical point for smaller firms) are less affected by damage caused by a single actor in their business ecosystem. Indeed, the depth and breadth of an SME's network can facilitate its resilience: greater global connectivity (through strong and stable contractual relationships in coordinated supply chains) makes the production organisation more resilient to internal shocks. Information sharing, trust and mutual support are three fundamental elements that companies can cultivate on their own. Similarly, strong internal ties between employees and management (which can be developed through innovation, learning and shared decision-making, the development of organisational sensemaking and good human resource management) is a factor of competitive advantage to cope with shocks.

Reactivity

This concept is based on the notion of resourcefulness - defined as the ability of managers to identify potential problems, set priorities and mobilise resources to avoid damage or disruptions - and the speed with which managers make decisions and implement them. The institutional economics literature refers to this capability as "adaptive efficiency". The ability of companies to create, transfer and integrate new knowledge into their operations through continuous learning enables them to better align with new developments. A high skill level of workers - as well as their diversity and correspondence with the needs of the

company - is a factor that favours company responsiveness during a crisis, as workers with the right skills and knowledge of the product and production process are more likely to come up with creative solutions to problems. Investment in research and development (R&D) helps companies learn, use technology and respond to the latest market developments, enabling them to be agile under pressure.

As we have seen above, the concepts of organisational robustness and resilience are fundamental for organisations to cope with internal and external transformations, risks, situations of uncertainty or deeper crises. These elements enable organisations to renew themselves in adverse situations and to adapt in a position of advantage before events occur. The concepts of organisational robustness and resilience are complementary and mutually reinforcing in nature. Both relate to the design, development and engineering of different capabilities, which are:

· Organsational skills (transforming one's own resources into inimitable assets to create a competitive advantage);
· Response capacity (anticipation and management of risks, planning of business continuity measures and adaptation of the system to dynamic environments);
· Cognitive skills (organisational interaction, continuous learning and awareness mechanisms);
· Dynamic capabilities (strategic alignment of systems to political, economic, technological, environmental and legal changes; i.e. identifying and seizing organisational challenges and opportunities, turning threats into opportunities).

RESILIENCE DASHBOARDS FOR THE SOCIAL AND ECONOMIC, GREEN, DIGITAL, AND GEOPOLITICAL DIMENSIONS, European Commission 2021

The Strategic Foresight Report 2020 (SFR) defines resilience as "the ability not only to withstand and meet challenges, but also to navigate transitions, in a sustainable, equitable and democratic manner". This establishes a clear link between the concept of resilience and ongoing social transformations. The SFR 2020 analyses resilience according to four interconnected dimensions (social and economic, green, digital and geopolitical) and outlines its importance for the achievement of long-term strategic objectives in the context of the Commission's agenda. Moreover, the SFR 2021 emphasises that in a multipolar, hyper-connected and contested global order, the EU aims to strengthen its responsible global leadership and partnerships, to defend its core values and strategic interests, and to convince the international community to pursue common goals for the benefit of the entire planet. In this context, strengthening the resilience of Member States is not only useful at national level, but also contributes to the resilience of the EU as a whole.

Resilience dashboards (of which we propose a geographical update in the following pages) are an innovative monitoring tool for the EU policy agenda. They provide a holistic assessment of the ability to make progress in achieving transition goals, across four dimensions: social and economic, green, digital and geopolitical. For each dimension addressed, the dashboard has selected indicators in relation to current global megatrends:

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SOCIAL AND ECONOMIC DASHBOARD.
Indicators: Inequalities and social impacts of transitions, Economic and financial

stability and sustainability, Health, education and work.
Megatrends: Rising inequalities, Changing nature of work, Accelerating technological change and hyperconnectivity, Evolving health challenges, Diversification of education and training, Growing demographic imbalances, Growing consumption.

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DASHBOARD GREEN.
Indicators: Climate change mitigation and adaptation, Sustainable use of resources, Ecosystems, biodiversity and sustainable agriculture.
Megatrends: Climate change and environmental degradation, Accelerating technological change and hyperconnectivity, Aggravating resource scarcity, Changing nature of work, Increasing inequalities.

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DASHBOARD DIGITAL.
Indicators: Digital for Private Space, Digital for Industries, Digital for Public Spaces, Cybersecurity.
Megatrends: Changing nature of work, Diversification of education and training, Growing influence of new government systems, Accelerating technological change and hyperconnectivity, Changing security paradigm.

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DASHBOARD GEOPOLITICS.
Indicators: Raw materials and energy supply, Value chain and markets, Financial globalisation, Security and demographics.
Megatrends: Worsening resource scarcity, Expanding influence of the East and South, Changing security paradigm, Growing demographic imbalances, Growing importance of migration.

RESILIENCE WITHIN EUSALP

APPLICATION OF THE EC RESILIENCE DASHBOARD IN THE ALPINE REGION

In this section of the report we propose a geographical update of the dashboard developed by the European Commission within the Competence Centre on Foresight. The dashboard aims to provide a holistic assessment of resilience in the European Union and its Member States. In relation to the economic, social and environmental transformations we are facing and towards future challenges, the dashboard assesses resilience as the capacity of each state to make progress towards certain important policy goals. Through a broad set of indicators, the resilience dashboard is able to assess the relative strengths and weaknesses of countries. The dashboard is of relevance because it reflects the EU's move towards an integrated approach to measuring people's well-being beyond GDP, shedding light on the future challenges and opportunities of sustainable development. Such an approach is central at a time when the disruption of established lifestyles due to the COVID crisis has stimulated debate on how we measure progress (The Porto declaration, European Council, May 2021). In this sense, in the total economy of the AlpGov2 project, the dashboard allows us to assess some elements of the political-social context that have a strong impact on the life and future development of enterprises, especially small and medium-sized enterprises that strongly characterise the Alpine business fabric.

A number of indicators were selected for the project from the four proposed thematic areas: social and economic, green, digital and geopolitical. The indicators, which we will see below, were reworked from the primary data available in Eurostat. The data refer to 2019, while the time variations are calculated with reference to 2015. The choice of certain indicators therefore responds to the objective of touching on certain areas of resilience (understood as the development of a socio-economic context in which businesses can be hindered or helped) and the need for available data.

As in the case of the vulnerability matrix, the indicators were presented through the representation of individual regional (for the employment area) and state (for the other areas), realities in relation to the average situation of the EU27. This method allows us to assess the positioning of each region, their advancement or retreat, in relation to the international context. The indicators were then grouped into three areas of influence: employment, material and energy and digitisation.

EMPLOYMENT MATRIX

With regard to the employment area, three indicators in particular were taken into account: full employment gap of the age group 20-64 (built from employment rate of the same age group), young people neither in employment nor in education and training (NEET rates) and gender employment gap. For the first two indicators, it was also possible to offer an assessment at regional level due to the availability of data disaggregated by NUTS2.

The first indicator was constructed from data on employed persons aged between 20 and 64 as a percentage of the population in the same age group. The indicator is based on the EU Labour Force Survey. The employed persons are those aged 20-64, who during the reference week did any work for pay, profit or family gain for at least one hour, or were not at work but had a job or business from which they were temporarily absent. In this case, we calculated the distance to full employment in order to obtain an indicator measuring the employment vulnerability of the groups of people residing in the various regions: the wider the gap, the greater the proportion of the population that is not actively participating in the labour market. On average, in the EU 27, the rate of distance to full employment is 27.3%. The regions with a clear distance to the EU average are the German regions of Tübingen and Oberbayern and the Swiss regions of Espace Mittelland, Zürich, Ostschweiz and Zentralschweiz (in these regions the employment rate is closer to the full employment level). In contrast, the French region of Provence-Alpes-Côte d'Azur, the Italian regions of Piedmont and Liguria and the Austrian region of Wien show a greater distance to full employment than the EU27 average. In general, for most of the Eusalp regions the gap is smaller than for the EU27 (predominance of light blue). Between 2015 and 2019, all regions show a decrease in the gap from full employment, with the exception of Liguria, Ticino and Région lémanique.

The indicator on young people neither in employment nor in education and training (NEET) corresponds to the percentage of the population of a given age group and sex who is not employed and not involved in further education or training. The numerator of the indicator refers to persons who meet two conditions: they are not employed and they have not received any education or training in the four weeks preceding the survey. The denominator in the total population consists of the same age group and sex. On average, the NEET rate in the EU27 in 2019 is 10.1 percent. The German, Austrian, Slovenian and Swiss regions show values of the indicator predominantly below or far below the

	FULL EMPLOY. GAP 20-64	NEET	GENDER EMPLOYMENT GAP
EU27	27,3%	10,1%	11,2%
Stuttgart			
Karlsruhe			
Freiburg			
Tübingen			
Oberbayern			
Niederbayern			
Oberpfalz			
Oberfranken			
Mittelfranken			
Unterfranken			
Schwaben			
Bourgogne			
Franche-Comté			
Auvergne			
Rhône-Alpes			
Provence-Alpes-Côte d'Azur			
Piemonte			
Valle d'Aosta			
Liguria			
Lombardia			
Bolzano			
Trento			
Veneto			
Friuli-Venezia Giulia			
Burgenland			
Niederösterreich			
Wien			
Kärnten			
Steiermark			
Oberösterreich			
Salzburg			
Tirol			
Vorarlberg			
Vzhodna Slovenija			
Zahodna Slovenija			
Région lémanique			
Espace Mittelland			
Nordwestschweiz			
Zürich			
Ostschweiz			
Zentralschweiz			
Ticino			

KEY

- much better than EU27
- better than EU27
- within the EU27
- worse than the EU27
- much worse than the EU27
- data not available

> +6% < +39%*

> -5% < +5%*

< -6% > -39%*

*variation from 2011 to 2018

benchmark: in these states, only the Vienna and Ticino regions are exceptions, which show values respectively in line and above the EU27 average. French regions show values below or in line with the benchmark and only the Bourgogne region has a NEET rate higher than that of the EU27. The situation in Italy, however, is different: most of the regions analysed have a NEET rate higher than the benchmark (led by Piedmont, the only region with a distance of more than 40%); the only exception is the Autonomous Province of Bolzano with a value lower than the benchmark. In terms of time, the indicator also shows a worsening in those regions that deviate positively from the European average such as Stuttgart, Oberbayern, Schwaben and Salzburg. For the rest of the regions, on the other hand, a decrease in the NEET rate is observed between 2015 and 2019, especially in those regions that lag behind the EU27 figure.

The third indicator taken into consideration is the gender employment gap: the indicator measures the difference between the employment rates of men and women aged 20 to 64. The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. In the EU27, the difference in the employment rate between men and women in 2019 is 11.2 %. The two states that show a clear gap compared to the European reference are France and Slovenia with 40% lower rates. The Italian situation is completely out of line with the trend of the entire Alpine region with a gap of +73.2% above that of the EU27. Between 2015 and 2019 the gap decreases in Germany, Slovenia and Switzerland, while it remains stable in France and Italy and increases in Austria.

DIGITALISATION MATRIX

KEY

much better than EU27

better than EU27

within the EU27

worse than the EU27

much worse than the EU27

data not available

+40% or more*

\> +6% < +39%*

\> -5% < +5%*

< -6% > -39%*

*variation from 2011 to 2018

This dashboard was entirely constructed from the Digital Intensity Index, i.e. ICT usage in enterprises. Digital Intensity Index (DII) is a composite indicator, derived from the survey on ICT usage and e-commerce in enterprises. Out of a total of 12 points obtainable (maximum 1 point for each dashboard variable), the DII distinguishes four levels of digital intensity for each enterprise: count of 0 to 3 points entails a very low level of digital intensity, 4 to 6 – low, 7 to 9 – high and 10 to 12 points – very high DII. The DII is used in the Digital Economy and Society Index (DESI), the main monitoring tool of the EU's Digital Decade, which sets the targets for the digital transformation of Europe by 2030.

The data extracted on an annual basis concern two categories of enterprises in order to shed light on both the size of the enterprises and their production specialisation: on the one hand, small and medium-sized enterprises and, on the other hand, enterprises engaged in manufacturing activities (both the focus of our project). The data therefore refer to the share of enterprises with a certain level of digital intensity in the total.

The first observation we can make is that small and medium-sized enterprises in the total economy perform better from a digital point of view than enterprises of all sizes in the manufacturing sector: in fact, considering the EU27 average, the percentage of enterprises with a low or very low level of digital intensity is higher for manufacturing enterprises than for SMEs; the representation is reversed when considering enterprises with a high or very high level of digital intensity.

With regard to enterprises with a very low digital intensity indicator, compared to the EU27 the share of enterprises in the manufacturing sector in Austria is much lower. The only regions in this category that show shares of enterprises with a lower level of digitisation than the
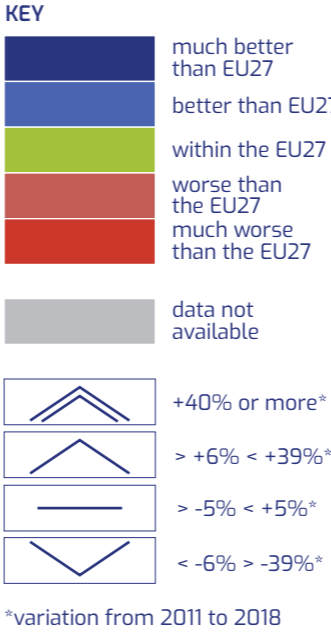
	ENTERPRISES WITH VERY LOW DIGITAL INTENSITY INDEX (DII VERSION 1)		ENTERPRISES WITH LOW DIGITAL INTENSITY INDEX (DII VERSION 1)		ENTERPRISES WITH HIGH DIGITAL INTENSITY INDEX (DII VERSION 1)		ENTERPRISES WITH VERY HIGH DIGITAL INTENSITY INDEX (DII VERSION 1)	
	SMEs	MANUFACTURING	SMEs	MANUFACTURING	SMEs	MANUFACTURING	SMEs	MANUFACTURING
EU27	40,0%	44,0%	36,0%	37,0%	21,0%	17,0%	3,0%	2,0%
Germany								
France								
Italy								
Austria								
Slovenia								
Switzerland								

EU27 average are France (only for small and medium-sized enterprises, while manufacturing is broadly in line with the European benchmark) and Slovenia (for both sectors considered). Between 2015 and 2019, enterprises with a very low level of digital intensity decrease or remain stationary in all cases considered, except for Austrian small and medium-sized enterprises, which increase over the period considered.

Looking instead at the distribution of enterprises with a low level of digital intensity, the only region in the Alpine region that shows a lower value than the EU27 average is Slovenia (but only in the case of SMEs). The share of SMEs and manufacturing enterprises with a low level of digital intensity is higher than the EU benchmark (around 35%) for the regions of Germany and for those of Italy and Austria (only in the case of manufacturing enterprises, while the share of SMEs is in line with the EU benchmark). In general, there is a decrease in the number of enterprises with a low level of digitisation or substantial stagnation (especially in Italy) over the period.

The situation is reversed when looking at the share of enterprises with a high degree of digital intensity. Compared to the EU27 average (21.0 per cent for SMEs and 17.0 per cent for manufacturing companies), Austrian companies show significantly higher shares than the European benchmark (especially for manufacturing companies). The share of German and French companies is broadly in line with the EU27 values, while the share of Italian and Slovenian companies (operating both as SMEs and in the manufacturing sector) is significantly lower than the EU average. An encouraging fact is the variation over the 2015-2019 time span: in fact, we can only observe positive variations in the different percentage shares, with very intense variations also in the Italian and Slovenian regions.

Finally, looking at the enterprises with a high level of the digital intensity index, we can immediately see that manufacturing enterprises in the Alpine region are clearly better positioned than the EU27 average; only Italian manufacturing enterprises are an exception, which instead deviate heavily from the average value. It is important to remember that in this case the share of enterprises with a very high DII value (3,0% SMEs, 2,0% manufacturing) is much lower than the share of enterprises with a high DII value (21,0% SMEs, 17,0% manufacturing). Also in this case, if we look at the time evolution of the indicator, we can observe a substantial enlargement of the share of enterprises falling into the very high DII category.

MATERIAL AND ENERGY MATRIX

KEY

- much better than EU27
- better than EU27
- within the EU27
- worse than the EU27
- much worse than the EU27
- data not available

- > +6% < +39%*
- > -5% < +5%*
- < -6% > -39%*

*variation from 2011 to 2018
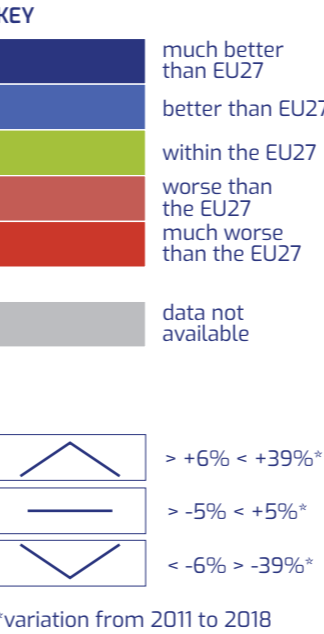
The third dimension observed is that concerning the macro-family of the use of energy and materials in production. In this context, we have observed four indicators concerning energy and materials, but with two lenses: on the one hand, the geopolitical dimension that characterises the supply of primary sources, which therefore refer to the concept of dependence on the outside, and on the other hand, the development of green supply chains, which therefore affect the environmental aspect and, implicitly, that of achieving greater independence from imports.

The first indicator, on energy import dependency, shows the share of total energy needs of a country met by imports from other countries. It is calculated from energy balances as net imports divided by the gross available energy. Values higher than 100% mostly refer to the build of stocks (increase of fuel in stocks), however might also be a result of statistical discrepancies in raw data. Considering the total energy sources, all the countries taken into consideration, except France, show a higher dependence on imports than the EU27 reference value (60.5%). Italy is the country that shows a

	ENERGY IMPORTS DEPENDENCY				MATERIAL IMPORT DEPENDENCY				
	TOTAL	SOLID FOSSIL FUELS	NATURAL GAS	OIL AND PETROLEUM PRODUCTS*	TOTAL	BIOMASS	METAL ORES (GROSS ORES)	NON-METALLIC MINERALS	FOSSIL ENERGY MATERIALS/ CARRIERS
EU27	60,5%	43,3%	89,6%	96,7%	24,0%	12,4%	52,5%	3,2%	69,0%
Germany									
France									
Italy									
Austria									
Slovenia									
Switzerland									

	CIRCULAR MATERIAL USE RATE	SHARE OF RENEWABLE ENERGY IN GROSS FINAL ENERGY CONSUMPTION
EU27	12,0%	19,9%
Germany		
France		
Italy		
Austria		
Slovenia		
Switzerland		

worse situation compared to the other Alpine countries with a percentage difference compared to the EU27 of more than 20%. France and Italy are closely dependent on imports of solid fossil fuels, while Slovenia shows a lower percentage than the EU27 average for this type of energy import. All states, on the other hand, are more dependent than the European average for natural gas imports (especially Austria). With respect to imports of oil and oil products, the Alpine states show values that are on average with the rest of Europe. Over the period considered, dependence on imports in general increases (the percentage share remains unchanged only for Italy and France out of the total energy sources considered).

The second indicator concerns the dependence on the import of materials. This indicator provides the ratio of imports over direct material inputs in percentage. The term 'material import dependency' shows the extent to which an economy relies upon imports in order to meet its material needs. Material import dependency cannot be negative or higher than 100%: values equal to 100% indicate that there are no domestic extractions during the reference year. Looking at the total of imported material categories, all countries show a situation of strong dependence on this type of import. In fact, all countries, in relation to the European average, have dependency rates above 40%. France is the only country that does not deviate by more than 50% from the EU27 average. Going into the specifics of imported materials, a strong dependence of the Alpine countries (with the exception of France) on biomass imports is evident, much higher (+200%) for Switzerland, Slovenia, Austria and Italy and higher for Germany (+150%) than the European average. For materials in the non-metallic minerals category, the most dependent countries are France, Slovenia and Switzerland, followed by Austria with lower rates. The category of fossil energy materials and carriers is the one in which the Alpine countries show the best performance with import dependency rates still higher than the EU27 average but not exceeding +50%. In general, over the period 2015-2019, a substantial stagnation in material import dependency rates is observed (only Slovenia shows a worsening performance).

The following two indicators, as we have mentioned, concern the development and dissemination of sustainable use of resources, i.e. materials and energy. The circular material use rate (CMR) measures the share of material recovered and fed back into the economy in overall material use. The CMR is defined as the ratio of the circular use of material to the overall material use.

A higher CMR rate value means that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting (or importing) primary material. At the European level, the CMR is 12.0%: France and Italy deviate from the EU27 average with values that are +60% higher, while Germany stands at +7%. The Austrian and Slovenian regions show values in line with the EU average. Between 2015 and 2019, a substantial improvement in the CMR can be observed (especially in Slovenia and Italy).

The last indicator gives an insight into the spread of renewable energies in energy consumption. The indicator measures the share of renewable energy consumption in gross final energy consumption. The gross final energy consumption is the energy used by end-consumers (final energy consumption) plus grid losses and self-consumption of power plants. In 2019, the share of renewable energy in the EU27 is 19.9 percent. In the same year, only Austria and Slovenia show higher percentage shares than the European value, while Germany, France and Italy deviate from the European average by about 10 percentage points. Here it is important to remember that the data refer to the share of renewable energy of the entire state (not just the Alpine regions). Between 2015 and 2019, there is an increase in the share of renewable energies in total energy consumption for Germany and France and a situation of substantial stagnation for the other countries.

FIELDWORK

THE ROLE OF CLUSTERS AND THE EUSALP NETWORK IN STRENGTHENING SME RESILIENCE

The wide-ranging impacts and lasting consequences of the structural crises that have occurred over the last twenty years, in particular the global financial crisis of 2007-2009 and the Covid-19 pandemic crisis of 2020, have pointed to economic resilience as one of the priority system-wide responses. The fallout from the global crisis has hit the poorest sections of the population hardest, contributing to the already started process of erosion of public confidence in global economic governance.

An OECD report on fostering economic resilience, setting out the recent challenges to resilience, highlights the importance of resilience also for the development of democratic societies and the policy options to strengthen it (OECD, 2021).

In the same paper, OECD indicates a triad of policies needed to overcome economic crises as follows:

1. Prevent the build-up of potential vulnerabilities;
2. Prepare to absorb shocks when they occur;
3. Strengthen the ability to engineer a swift rebound from the shocks.

It is clear that different shocks (monetary, political, technological, natural) have different impacts on companies depending on their type, their duration (long or short term), but also on the type and size of the company, and produce different vulnerabilities. Consequently, companies may react to these shocks in different ways depending on their type and the type of shock to which it reacts.

The European Cluster Collaboration Platform (ECCP, 2021) identified four courses of action available to companies to react to shocks:

- Re-establish: actions are confined to dealing with the outcomes of the shock like financial replanning or insurance review;
- Reconsider: actions are aimed at development of a new business case, limited to the shock;
- Reconceive: actions are aimed at development of an alternative business plan;
- Reinforce: actions are aimed at implementing measures specifically targeted on reducing the risks that do not change the overall supply, production and sales process.

This group of actions corresponds to the need for changes, which ECCP has summarized in three specific groups:

- New networks: build new stable networks to have new suppliers, new sales partners, new production partners or new research partners;
- New business practices: design changes in the business practices, to adapt to innovation, build new training capabilities or adapt them to new production technology;
- New intelligence: organize intelligence on markets technologies, and regulations to find the right actions for the companies.

Cluster organizations in the EU can have a very important role in helping their companies to prepare for shocks and to mitigate the risks of them, through support actions for:

- **Stimulating** a good understanding of political and regulatory decisions and their durability and trends;
- **Gathering and sharing** intelligence on the political landscape and events of their key supply and export markets;
- **Providing** business support and the networking capability helping the companies to remodel the value chain;
- **Advising** companies on choosing the right reinforcement actions.

Secondly, it is important to emphasize the role that clusters have in the European strategy (EU Green Deal) to support a competitive and decarbonised economy. Innovation promoted by European policies, including the digital transition, underpins the decarbonisation strategies of industrial sectors. Through the recognition of the close relationship between the digital and green transition, clusters can be instrumental in supporting the identification of actions necessary to achieve the two transitions.
Clusters can be attributed the natural ability to be promoters of a "place-based" change strategy. Indeed, initiating systemic change does not mean adopting a one-size-fits-all approach to twin transitions. Systemic change, which may occur through the introduction of innovations at political or technological level, has direct spill-over effects at local level, but is nevertheless influenced by a network of multi-level relations. It means that, depending on the territory in which the system change is coveted and subsequently implemented, the balance between decarbonisation and digitalisation of the economic system absorbs the characteristics of the territory and the status quo.
The change pursued by a place-based strategy has to be framed, through the intermediation of clusters and trade associations, on the needs and potential of industry at local level. This means that decarbonisation and digitalisation pathways may vary over time and also according to the different geographical areas where they take place. The European industrial strategy has promoted an approach based on industrial ecosystems, i.e. the set of players structuring a value chain. At the local level, the analysis of regional ecosystems in terms of digitalisation and decarbonisation is therefore necessary to define the priorities for action and the most effective strategies. Transitions could benefit from the local stabilization of learning processes, from the creation of support networks, from the structuring of a solid market network or from the launch of some experiments in innovation. The linking of the transition framework to cluster activities, and consequently to the intrinsic characteristics of the territory, at socio-economic, political and environmental level, makes the approach instrumental in promoting twin transitions.

On the basis of these connections and in line with the EU strategy for a new industrial policy, the proposal of a transition project, even at the level of a pilot action, involving different industrial ecosystems of the same territory has a place in the Alpine Space projects and in particular in AlpGov2. The interviews, which we will look at in more detail below, highlighted one element more than others: the need to define common priorities for action for the Alpine Space that draw strength from existing relationships, already structured value chains and similarities (but also diversities) at regional level. In other words, the definition of the Alpine Space as a real multi-sectoral and territorial industrial ecosystem. The contribution and work of clusters, as well as of digital innovation hubs, is of fundamental importance for the structuring of pilot actions and the macro-regional strategy: clusters, working in different industrial ecosystems, have the capacity to bring common characteristics to the territorial level and to define priorities for change. Not only clusters, but also academia, research, civil society and the political community have the responsibility to share knowledge in order to better design place-based planning (including through the use of knowledge transfer tools).
It should be noted that clusters have the capacity to extend the time horizon of enterprises in order to allow them to make strategic choices (which would otherwise not be taken into account due to economic or planning vulnerability). Clusters are therefore those ecosystems where companies can create shared value in order to strengthen corporate identities, implement a sense of belonging to the network and increase competitiveness. In this sense, the creation of shared value through clusters can play an important role in the engagement of local communities in green transition and resilience.
The interviews to the main stakeholders of the AlpGov2 project, which include all the actors belonging to the AGs of the EUSALP strategy, and the questionnaire interviews to a group of companies of the Alpine territory allow us to draw some important elements of evaluation about what are actually the needs and the potentialities of the manufacturing industrial system of the Alpine Space to proceed to a green and digital transition.

Interviews with key project stakeholders

As mentioned above, the collection of evidence, during the course of this study, was also conducted through qualitative interviews with some of the main stakeholders of the EUSALP system. Below is a table of those interviewed between January and February 2022, whom we would like to thank.

Diego Bosco	ItalBiotech
Gian Antonio Battistel	Task Force EUSALP "Multifunctional Forest and Sustainable Use of Timber"
Luca Mion / Elisa Morganti	Hub Innovazione Trentino
Carlo Vigna / Alessio Pastorino	Regione Valle d'Aosta
Massimo Lapolla	Regione Piemonte
Mateja Dermastia	EUSALP WP
Sylvain Guetaz / Simon Soltner	Région Auvergne Rhône-Alpes
Bojana Omersel	SRIP Tovarne prihodnosti

Thomas Egger _____ *Swiss center for mountain regions SAB*

Marco Di Furia _____ *DIH Piemonte/VdA*

Daniele Berti _____ *Confindustria Trento*

The interviews allowed us to directly investigate the main themes concerning the concept of resilience from multiple points of view, corresponding to the role that each subject plays within the EUSALP system and beyond: they are in fact representatives of institutional bodies, business representative organisations and innovation centres.

The discussion focused on three main themes:

- The role of clusters and networks operating in the EUSALP system in strengthening the resilience of SMEs;
- The typology of enterprises successfully applying digitalisation tools in circular economy systems;
- The policies, regulatory changes and system resources (knowledge sharing, best practices, training) that enterprises, particularly small and medium-sized ones, demand from policy makers or external stakeholders.

The evidence shows the centrality and strengths of the relationship system in the Alpine Space, but also the missing conditions and consequently the requests for improvement. We can categorise the main evidence from the stakeholder interviews by identifying the four groups of supporting actions we saw above.

Group 1: Stimulate

Through the dissemination of information and training between companies and regional business systems in different countries, new value chains can be identified in the Alpine Space area. In this sense, clusters are central in the opening of SMEs towards new (production and market) scenarios. Furthermore, with the support to the digitalisation of information

and production processes provided by business networks, SMEs acquire new development opportunities. The urgency of the transition to new digital systems or ways of doing business has been made even more evident by the impact of the Covid19 pandemic.

Group 2: Gathering and sharing

As can be seen from the sectoral mapping of indicator 2, which shows a heterogeneous manufacturing specialisation across the Alpine Space, it is necessary to support regional specialisation, beyond administrative borders, in order to overcome those vulnerabilities related to supply chain structuring and market outlets. In this respect, clusters and business networks, acting in the different regions through the dissemination of good practices of digitalisation of production processes, are able to accelerate the transition towards Circular Economy systems and consequently strengthen the resilience of external sources of inputs and outputs. In this sense, clusters offer companies the possibility to participate in the structuring of the value chain through widespread projects and best practices, acting on the specific business functions concerned;

Group 3: Providing

The potential of business networks is also expressed through the creation of operational networks: this means the creation of a network of external relations that not only supports the dissemination of information and knowledge, but also supports and stimulates the dissemination of practices and skills. In this respect, therefore, 'clustering' means not only

matchmaking, but also disseminating a set of operational standards and providing for the creation and operation of 'operational practices of the digital space'. One of the most important obstacles to the digital transition emerged from the interviews and confirmed, as we will see later, by the results of the questionnaires is precisely the lack of practicality in approaching digital business tools. There is not yet a shared arena of operational practices in which SMEs can learn and practice to design their own transition strategy. Through the provision of a sharing platform, SMEs are more stimulated, reassured and interested in exploiting the potential of digitalisation. Indeed, the aim of clusters is also to ensure that SMEs and regional strategies do not act alone, but make use of shared resources of the Alpine Space.

Group 4: Advising

The existence of a direct trust relationship between SMEs and clusters enables the latter to have a broad and articulated scope of action within business development strategies. The involvement of SMEs in economic development projects in the Alpine Space, in particular those proposed by European organisations and financed by EU funds, is facilitated by the intervention of clusters: the task of intermediation between individual company action strategies and the objectives of national and European policies is of great importance since it allows to translate policies into concrete actions and vice versa the requests and needs of the entrepreneurial fabric into programmatic and political objectives. Furthermore, the ability of clusters not to identify uniquely with only one of the manufacturing value chains, but rather with several value chains (multisectorality), is also a priority in the interviews. This allows clusters to enjoy a privileged position as observers and to propose on the one hand updates of public and market rules and regulations

and on the other hand to guide companies in adopting a land-based strategy.

There are, however, a number of critical organisational and structural issues on which clusters, business networks and, in particular, institutions at several levels of governance can act to shape place-based industrial development models. These critical issues are of different nature and may affect monetary and financial dynamics, political governance, technology development and adoption, or systems to combat and adapt to climate change. From the interviews with the stakeholders, a number of critical points emerged that affect the governance of the macro-regional strategy at financial and political level. The main points are listed below:

1. The lack of specific funding lines for the development of territorial "ecosystems" of Circular Economy hinders greater connection between the different manufacturing chains, which could be stimulated through the adoption of digital tools (acting not only on the physical flow of goods, but also on the digital flow of information);

2. Problems persist related to the territorial adoption of EU laws and regulations: from a legislative point of view, regional institutional systems have difficulties in adopting EU Directives in the field of innovation and Circular Economy. Moreover, also the entrepreneurial system has many difficulties in adapting its activities to the continuous regulatory changes introduced in the Circular Economy;

3. There is a lack of a systemic approach at European level to support the development of SMEs: very often the introduction of instruments and funding at European level (including those related to the simplification of administrative procedures) has not taken into account regional differences. Even in the EUSALP area

there are strong divergences: for example, Slovenia has already focused a lot on the development of Circular Economy systems and the spread of digitalisation, as has Lombardy (the only region to have a regional strategy for CE), while French regions have produced innovative financial instruments. Without the use of a system infrastructure at the political level, this type of resource encounters problems in disseminating and capitalising on existing experiences;

4. The problem of administrative simplification is a major obstacle to the development of innovation and it is particularly related to the problem of language: overcoming difficulties in SMEs' understanding of governance mechanisms by simplifying the language. In general, tools and instruments are only effective if they can produce a tangible output for businesses;

5. Reshaping technical structures to support business innovation: digital innovation hubs in rural and mountain areas are very different from those in larger manufacturing centres. In this sense, it is useful to rethink digital innovation poles as territorially distributed rather than concentrated units. Indeed, when they are not already part of an ecosystem, companies tend to act alone. The development of digitalisation of production processes can be useful for the creation of new and wider value chains by facilitating the matching of supply and demand.

Questionnaire evidence

The evidence gathered and organised as a result of the interviews was validated and reinforced by the results of the questionnaire administered to small and medium-sized enterprises. In the overall economy of the study, the interviews and the questionnaires are interdependent in drawing a picture of the resilience practices and experiences of SMEs in the Alpine area.

The questionnaire is also a central tool in the study in order to understand and collect the needs of enterprises, so as to provide stakeholders with indications for a better and more efficient planning of activities within EUSALP.

The questionnaire was aimed at small and medium-sized enterprises (up to 250 employees) in the EUSALP regions (Austria, France, Germany, Italy, Slovenia, Switzerland). The companies surveyed operate in the following sectors: wood, chemicals, mechanics and mechatronics.

The questionnaire is divided into three concise parts: the first part is anagraphical, the second part investigates the vulnerabilities within the company's activities and the tools adopted to overcome them, and the third part focuses on digital tools for circular economy systems. The 17 mainly closed-ended questions that make up the questionnaire were administered in the respective languages of origin of the different companies.

A total of 6 companies responded to the questionnaire, located in Austria (in the province of Innsbruck-Land, Tyrol), Italy (in the provinces of Bergamo and Varese, Lombardy) and Slovenia (Vzhodna Slovenija, Posavina Region). Most of them are small companies employing between 10 and 49 people in their activities, while two companies are medium-sized companies employing between 50 and 249 people. Half of the companies that responded to the proposed questionnaire are engaged in manufacturing in the field of mechatronics, and the rest are engaged in the production of chemical products or wood processing.

Only one company in our sample has been part of a cluster (or enterprise network) for at least four years. The same company, in particular, participates in the network of several clusters: the first cluster is

national and, addressing all economic sectors, offers financial support for the development of innovation. The second network experience indicated is that of the Q-Zirkel, i.e. Quality circles: this is a methodology within companies for solving problems or improving the quality of work and production processes. The same company also participates in the industrial network of the national association for water and waste management. This example gives us a clear view of the importance of developing and protecting external and internal relations within the company as drivers for the achievement of different business objectives: innovation, job protection, sustainability.

The first part of the questionnaire investigated the vulnerabilities most felt by companies and, therefore, which are the events external to the company's activities that can potentially have a major and long-lasting impact on the organisation and its production activities. The first three events that are rated as having the greatest impact on companies' activities are:

1. The occurrence of problems (e.g. interruptions, intermittency phenomena) with the supply of raw materials;
2. The constant variation and confusion at the level of legislation and regulations;
3. Market instability and hyper-competition.

Another problem that disrupts the stability of companies is linked to difficulties in finding staff with appropriate skills: the weights attributed to the occurrence of such an event are heterogeneous, but nevertheless indicate an important sensitivity of companies to the issue of school and university training and links with the world of work.

Among the various actions implemented by companies to overcome elements of vulnerability (contrast) or to strengthen the internal organisation of their activities

(prevention and adaptation), those most used by companies concern the revision of work processes, and therefore a substantial internal reorganisation of company functions, internal relations and work activities, together with the adoption of risk analysis tools. Therefore, the behaviour of SMEs is aimed on the one hand at adapting to external disturbances that destabilise the organisation of work through the innovation of industrial processes and on the other hand at trying to prevent the occurrence of destabilising events through a rigorous assessment of the weak points within their own organisation.

The transition towards the digitalisation of activities is considered to be a priority, both in terms of digital innovation in production processes and in terms of training and retraining of staff already working in the company. In the same way, companies also attach importance to communication activities with the outside world and with internal components, with a view to strengthening their own relational capacities.

With regard to the adoption of more practical tools, over the years SMEs have developed the possibility of adopting time-to-market innovation solutions, drafting Business continuity plans (i.e. structuring a general organisation that allows critical functions to remain operational after an emergency or interruption of activities), changing the supply chain management through new types of suppliers or customers, drafting Disaster Recovery Plans (i.e. structuring one's own organisation to ensure the continuity of certain activities and business functions during emergencies), promoting smart working and training staff in the green sector.

Most of the companies surveyed believe that they are included in a circular economy system in the same way as other companies. The main enabling factors for being part of a circular economy system

are varied and relate in particular to:

1. From the point of view of internal organisation, the vision of the company may be influenced by the possibility of exploiting untapped business opportunities;
2. From the point of view of relations with the outside world: on the one hand, the use of tax incentives that stimulate transition (tax relief, funds for the modernisation of production processes, tax concessions, etc.) and, on the other hand, the introduction of legislative changes or regulations that direct companies towards a new type of production process.

In addition, the technological evolution of the sector and therefore the introduction of best available technologies is considered a fundamental lever for changing its production system (especially in the mechanical and chemical sectors).

On the other hand, as regards the barriers preventing the transition of production systems towards circularity, SMEs indicate that the main obstacles are economic and organisational factors. If, as we have seen before, technological availability is a strong enabling factor, its non-availability on a large scale at a cost-effective cost makes it one of the main obstacles for enterprises, especially for small and medium-sized ones. In addition to this shortcoming, there are two central elements from the point of view of the sustainability of investments: on the one hand, the existence of very uncertain or capital-intensive payback periods for investments and, on the other hand, the possibility of having to deal with real production costs (OPEX) that are not fully in line with market prices. From an economic point of view, therefore, market behaviour has a major influence on the choices made by companies, which find themselves responding to an insufficient demand for the product due to a higher price than that of a "non-circular" product. Among the organisational factors that discourage the transition to a circular economy system, companies insist, again, on the structure of the supply chain and in particular the lack of suppliers or customers interested in using secondary raw materials.

The issue of raw material procurement also features prominently in the series of indications provided by SMEs regarding practices that are considered useful to integrate within the company organisation in view of the circular economy. In this sense, circularity is seen not only as the reuse and valorisation of production waste products, but as an effective rethinking of the entire value chain. What companies are aiming for is the inclusion of circularity principles (modularity, reproducibility, reduction of material use, prolonged use of manufactured goods) in their business plan and future projects, but also in the development and design phase of products and services. With regard to materials, responding companies indicate as a priority for action the achievement of a high level of use of renewable energy sources and the use of secondary materials in a significant percentage of the total acquisition of material assets. Here, too, companies emphasise the importance of collaboration with research and/or consultancy organisations in the field of the circular economy. Furthermore, for the wood sector, the creation of a digital platform to manage the purchase and transfer of recyclable materials is a practice with a strong impact in the transition towards circularity and digitalisation.

As we have seen, the theme of digitalisation of production processes has been addressed within the various sections of the questionnaire also in order to understand how important digitalisation is in defining the priorities of SMEs. The last section of the questionnaire investigated in particular the relevance of digital tools for the transition to a new circular production system. The companies responding to the questionnaire indicate that they are better placed in a digitalisation context than the average for the sector and, of the digitalisation practices that have been proposed, they essentially indicate three relevant approaches:

1. Tracking the origin of raw and secondary materials (before acquisition, during production, after sale);
2. Access to services or infrastructures (e.g. online platform) for the reuse-recycling of the product or for the extension of its lifetime;
3. Investment in digital technologies (IoT, remote control, smart metres, cloud systems, blockchain) to increase energy efficiency and circularity potential.

FIELDWORK

INTERVIEWS WITH SMES AND COLLECTION OF ISSUES AND BEST PRACTICES

In order to deepen some of the themes resulting from the answers to the questionnaire administered, we asked some SMEs to be interviewed. The following pages present the main results organised in five thematic areas: logistics and supply chain management, resources and circular economy, internal organisation and digitisation of processes, institutions and access to innovation, youth and training. Each thematic area brings together entrepreneurs' demands, problems and good practices linked by a single thread to the question "what does resilience mean to you?". We would like to thank the companies again for their willingness to give an interview: BDG EL. Srl (Carlo Del Grande), Watercryst Wassertechnik GmbH (Robert Salchner), Rotastyle Srl (Paolo Rota) and Chemcolor Sevnica d.o.o. (Pavli Pori).

LOGISTICS AND SUPPLY CHAIN MANAGEMENT

▲▲▲▲▲▲ LOGISTICS QUALITY ▲▲▲▲▲▲

For SMEs, a large part of the value chain resources is spent on logistics. The issue is persistent, but during the pandemic it has exploded in two respects: economically, through increased service and fuel costs, and organisationally, through better planning of purchases and the reduction of inventories.

▲▲▲ PROXIMITY OF SUPPLIERS ▲▲▲

This is an important element for companies in the region: the strong connection with other companies in the supply chain allows companies to remain in the domestic market and avoid interruptions in the supply chain (as may occur during temporary shocks or persistent crises). In addition, supplier diversification is an important resilience factor.

▲▲▲ GEOPOLITICAL INSTABILITY ▲▲▲

Internal EU markets may be affected by the market power of some products imported from outside the EU and by the consequences of the ongoing war. The issue is particularly related to the supply chain of bio-based supply chains.

▲▲▲▲▲ INDUSTRIAL MODEL ▲▲▲▲▲

The industrial model of the Alpine regions is not of the Fordist type and consequently requires a wide network of relations with other enterprises. The pandemic crisis has accentuated the issue of the interdependence of enterprises in the region (especially related to the problems of free movement of people and goods).

▲▲▲▲ LEAN MANUFACTURING ▲▲▲▲

This type of manufacturing system is well suited to the companies in the area (and particularly in the mechanical engineering sector). The lean system has a positive cascade of organisational resilience because it produces an improvement in the quality of production processes. At the same time, the system has an important fragility: goods must have a continuous flow in/out, stressing the internal and external logistics system. Outside the large industrial centres, there is a major logistics problem that has to deal with the fragility of the lean system.

▲▲ SUSTAINABILITY CERTIFICATIONS ▲▲

The availability of certifications greatly influences the structuring of the supply chain, because all companies in the chain are required to offer certified products. In general, certifications are not affordable for all SMEs.

RESOURCES AND CIRCULAR ECONOMY

▲▲▲▲ PRODUCT COMPOSITIONS ▲▲▲▲

Some products contain different types of materials (plastics, noble materials, silver, copper) that are difficult to separate and differentiate. In this case, the development of research (internal or public) at a technical level can help overcome this problem.

▲▲▲▲▲▲▲ NIMBY ▲▲▲▲▲▲▲

The recovery of some materials is located in regions far from the place of production, which is why institutional intervention at macro-regional level is required alongside the creation of a platform (at macro-regional level) that allows SMEs to gain visibility and find other SMEs that want to recover, avoiding sending the product to other regions.

▲▲ REPLACEMENT AND EXCHANGE ▲▲

Product tracking is a very effective innovation element. In addition, companies try to work on the development of effective new technologies for the production of products with greater durability (robustness must once again become an important product characteristic).

▲▲ REDUCTION OF RESOURCE USE ▲▲

Practices used by the companies: i. reuse of heat produced during the processes, ii. use of processing waste to produce thermal energy for heating production areas, iii. experimentation with a solution to produce electricity using systems based on pyrolysis of the material: slow combustion to create gas and then used to run engines and produce energy (the technology was abandoned because it was not considered interesting).

INTERNAL ORGANISATION AND DIGITISATION OF PROCESSES

▲ RELATIONSHIPS BETWEEN PEOPLE ▲

Entrepreneurs emphasise the importance of the 'human aspect': the pandemic crisis has provided greater awareness within the company of the importance of interpersonal connections (interdependence).

▲▲▲▲▲ LOCAL WELFARE ▲▲▲▲▲

Construction of the local welfare network through careful work with and on human resources. Practice used: WHP (Workplace Health Promotion) projects.

▲▲▲▲▲▲ LEADERSHIP ▲▲▲▲▲▲

Very flexible leadership streamlines decision-making processes and stimulates the ability to respond immediately to shocks or crises.

▲ POST-PANDEMIC REORGANISATION ▲

During the first wave of covid, company organisation was geared towards 'home office' systems wherever possible. On the production side, a weekly division of shifts was opted for; at the same time, companies invested heavily on the IT front: IT was placed in production to track progress, production levels and to increase defence infrastructures against external digital vulnerabilities (through proxy infrastructures equipped with firewalls).

INSTITUTIONS AND ACCESS TO INNOVATION

▲▲▲▲▲▲▲ LOBBYING ▲▲▲▲▲▲▲

In order to prevent sudden legislative changes, companies use institutional lobbying practices (through business networks).

▲▲▲▲▲ SIMPLIFICATION ▲▲▲▲▲

Significant bureaucratic problems persist in some regions (e.g. in Italy), mainly related to the provision of authorisations and permits and the heterogeneity of documents to be transmitted and procedures to be followed.

▲▲▲ ACCESS TO INNOVATION ▲▲▲

Enterprises mainly turn to private consultants who are considered more efficient and faster and more rarely turn to public bodies or regional knowledge and technology dissemination institutions. In general, companies experience difficulties in accessing the call for tenders (time too long, distance between public funding (after) and commitment of expenditure by the private party (before)).

YOUTH AND TRAINING (ACADEMY)

▲▲▲▲▲▲ TERRITORY ▲▲▲▲▲▲

A good practice at university/industrial cluster level is the one proposed in the Varese area. The LIUC (Carlo Cattaneo University) offers courses in integrated business management and over the years has stimulated the area's entrepreneurial vitality. Strong is the attractiveness of a very small reality, such as Varese, to students who want to stay in the area; during the pandemic, video call systems have allowed companies to continue their relationship with people, with young people and with universities.

▲ YOUNG PEOPLE EMPLOYED IN ENTERPRISES ▲

The knowledge and skills development sector plays a central role in enterprise, therefore the employment of highly trained young people in the enterprise is an advantageous factor.

REFLECTIONS AND CONCLUSIONS

In order to define sectoral policies to support resilience actions, a simple snapshot of economic reality is not sufficient, i.e. information on the specific characteristics of individual sectors of production activity and their specific weight within a given economic system or their characterisation in terms of competitiveness is not enough. It is necessary to know how sectors relate to other sectors present in a given territory. In fact, the effectiveness of an intervention aimed at a specific sector of activity also depends on the system of relations that this sector has with other sectors; the broader and more articulated the structure of intersectoral relations, the greater the impact of the intervention and the policies planned (Istat, 2020). Therefore, it is necessary to move from the description of an economic system in terms of production specialisation to the reading of more socio-economic dynamics and the system of relations between enterprises.

The fragmentation of the production system (which, as we have seen, affects many regions in the Alpine region) produces greater dispersion and slowness in the dissemination of incentives within the production systems, in terms of economic exchange and investment, but also in terms of the transmission of technology, innovation and competitiveness. This fragmentation does not hinder the creation of multiple networks of relations within the production system.

The definition of sectoral resilience and growth policies, therefore, in addition to taking into account the specific characteristics of the sectors in terms of economic weight and competitiveness, must also take into account the construction of relations between the different sectors and enterprises. In fact, the effectiveness with which a stimulus addressed to a given sector triggers an expansion of the economic system depends not only on the relevance and

responsiveness of the sector itself, but also on the ability to transmit this stimulus to the rest of the production system. In this context, the structure of intersectoral relations determines the extent and spread of activation effects.

The vulnerability matrix constructed in the preceding pages takes into account two elements that are central to the structuring of the relationships between firms: the productive specialisation of each region and the size of the firms operating in the four sectors considered. In this sense, the matrix can be read as a guide to understanding the dynamics of investments and technological innovations in the different regions. Some regions evidently enjoy a privileged position given above all by the solidity of their business organisations, which cuts across all the sectors analysed indifferently: this dimension can be useful for understanding the possible relationships between the different sectors. Other regions, on the other hand, show greater capacity in specific supply chains: in particular, the wood supply chain is the one that shows the least differences between the different regions and states because, being a sector of the bio-based economy, it is particularly linked to the regional territory and the availability of resources and production specialisation.

The reading at sector and company level of the socio-economic dynamics characterising the Alpine region was enriched through the analysis of the indicators of the regional resilience dashboard: the selected indicators should therefore be read not only as elements characterising the economic and political context in which small and medium-sized enterprises operate, but also as elements strongly influencing business investments, the structuring of more favourable value chains and

the action of institutions supporting the socio-economic development of the territory. The first (employment) matrix offers indications for the development of active labour policies: on the one hand, the stimulus for policies favouring full employment is guided by the reading of the full employment gap, while on the other hand the focus shifts to the quality of employment. The NEET rate is an important element in the assessment of labour market inclusion and training: in this sense, the indicator offers regions (in many cases responsible for educational, academic and vocational training proposals) a clear need to invest in training and labour market inclusion of the youngest, which represent an important element of competitiveness, especially when considering the management of technological innovations, in the digital and green fields. This need also emerges clearly from the interviews with entrepreneurs: there is a need for the creation of more and wider opportunities for the inclusion of young people in the territory (which may be entrepreneurial academies, continuous training tools, job placement contiguous with university training years) so that the relationship between young people-businesses-territory is a driver of the social and economic development of the regions. Inclusion of women in the labour market is likewise a strong element of competitiveness: regions with a poor ranking in the indicator compared to the EU27 pay a high economic and social price due to the exclusion of human resources, skills and talents on the basis of gender. The gap in the period 2011-2018 decreases in only three regions, while in the others it remains stable or even increases compared to the EU27. Again, individual choices of business organisations are not enough, but public policies have an important weight in strengthening the inclusion of the still disadvantaged groups: young people and women.

Public policies at regional, national and European level also play an important role in defining the degree of energy and material independence and autonomy. In this sense, it is important to consider that greater independence from energy and material inputs depends jointly on the 'behaviour' of companies and the support instruments developed by institutions in defence of the public interest. Businesses, as we have seen above, play an important role in enhancing import independence through two instruments in particular: technological innovation and the use of circular economy resources. It is clear, then, that in order to increase the degree of independence from imports of resources and energy, companies must be put in the best possible position to invest in research and development and to create a solid and close network of the circular economy. These themes were among the main indications given by companies during the interviews, related to the topic of logistics and resource utilisation. For SMEs, innovation is hindered by a lack of enabling conditions and resources: financial, where companies use their savings to cover ever-increasing operating costs, and systemic, where companies fail to access funds for technological development, fail to fit into a knowledge and technology dissemination system or fail to integrate the necessary skills and competences within their organisation.
In this sense, companies must be put in a position to use their resources not to survive and thus pay the imminent costs of a crisis or change, but to use them to adopt long-term strategic planning that allows them to be flexible in achieving their goals.
In this context, as we have seen several times in the course of our discussion, enterprise networks and in particular clusters of enterprises assume an important role by positioning themselves as intermediaries between the public space and the entrepreneurial fabric

and as facilitators of entrepreneurial development processes. By supporting the creation and strengthening of clusters, the regional development macro-strategy can overcome those difficulties endemic to the Alpine region. The functions of clusters (stimulating, gathering, providing, advising) act jointly in support of regional governance by making their network available in order to:

1. Assisting public/private institutions in the creation of specific funding lines for economic, technological and human resources growth within companies based on existing value chains and those that can potentially be developed, taking into account the needs and demands of entrepreneurs;
2. Supporting the transposition of European and national regulations through a widespread dissemination of the challenges and benefits of regulatory innovations: the big advantage of clusters is the use of a language close to the SME world, which tends to highlight the positive externalities of such changes;
3. Interacting with decision-making organisations (at regulatory and financial level) not only as intermediaries for receiving changes, but above all as a 'voice' instrument: i.e. proposing strong institutional lobbying that brings the operational results of systemic relations to the decision-making table in a way that highlights the differences that exist between regions and sectors of economic activity (to avoid one-fits-all approaches).

Earlier, we mentioned business 'behaviour', highlighting the potential of the business fabric to contribute to the reduction of material and energy imports. However, business behaviour is clearly not limited to this single aspect, but, especially in the context of resilience, the behaviour adopted by SMEs has a

far-reaching impact on the resilience of value chains and the resilience of the regional business fabric. Robustness, connectivity and responsiveness are the central resources in moving businesses towards a safe harbour in an environment of high uncertainty, influencing business choices in three different directions: follow competitors, challenge the market or reinvent themselves. Even after a careful risk analysis and the preparation of a strategic exit plan, it is clearly not enough for companies to choose one of the three directions, but the ability of each individual company to be able to attract and nurture skills plays an important role.

This means that strategy is not enough, but organisation at the operational level is needed at the same time. Maurer's thesis, which we have seen above, highlights how a company's resilience is linked to four concepts: transformation, anticipation, interaction and dynamism. These elements clearly stem from the internal organisation that each company decides to adopt and consequently directly influence all the five thematic areas that we have chosen to represent the SME interviews: logistics and supply chain management, resources and circular economy, internal organisation and digitisation of processes, institutions and access to innovation, youth and training.

We could define at this point four priority recommendations for the business system to which this report is addressed:

1. Reorganising business processes to reduce the strict dependence on logistics;
2. Emphasise the possibilities and tools for interaction with other companies to define a unique industrial model for the area;
3. Overcome the NIMBY concept in the circular economy by adopting a strategic alignment of the system to political, economic, technological,

environmental and legal changes;
4. Stimulate internal organisational interactions and continuous learning in order to attract new competencies in-house (including young people and local resources).

In conclusion, the report clearly illustrates the existence of differences between the various regions on the slopes of the Alps. At the same time, the report highlights many points of interest that are common to the actors in this space: SMEs, workers, business organisations and public bodies supporting economic development. It outlines a field of action populated by a large set of actors who work for regulatory, technological and green innovation in a broad and direct way and who, in the coming years, can make the Alpine macro-region a key player in European territorial development. As we have seen, the Alpine region is a mixed territory, populated by complex value chains, some long-lived and some fast-growing, and projected to become increasingly interregional and inter-sectoral. The task of AlpGov2, and of the regional macro-strategy in general, is to stimulate the exchange of experience and knowledge between regions, companies and industrial organisations and to safeguard the centrality of work in a world in constant transition.

ANNEXES

SMEs QUESTIONNAIRE

Company details

1. Company name:
2. Region where the company is located:
3. Number of employees:
   - 1 – 9
   - 10 – 49
   - 50 – 249
   - more than 249
4. Manufacturing sector:
   - Wood
   - Plastic
   - Chemical
   - Mechanic/mechatronic
5. Is the company a member of clusters or networks of companies?
   - Yes, before 2018
   - Yes, after 2018
   - No
6. If yes, specify which:
7. Contact person of the questionnaire:

Part one: vulnerabilities

8. Given a list of events/situations internal and external to the activities of the SME, identify the five most impacting events and give them a score (1=least impactful; 5=most impactful).
   - Natural disaster
   - Climate change
   - Health emergency
   - Regulatory variations/confusion
   - Market volatility
   - Financial fluctuations
   - Infrastructural deficiencies
   - Problems with the supply of raw materials
   - Hyper-competition
   - Difficulty in networking with other companies in the sector
   - Remoteness of the institutions
   - Inefficiency of industrial representative
   - Difficulties in finding staff with appropriate skills
9. Over the course of your business activity, have you adopted tools of contrast or adaptation to the events that cause vulnerabilities chosen above? With regard to the five events chosen above, please indicate one or more tools from the list or propose a tool not present.
   - Action plan
   - Risk analysis
   - Business continuity plan (general organisation that allows critical functions to remain operational after an emergency or activity interruption)
   - Disaster recovery plan (organisation to ensure continuity of certain business activities/functions)
   - Changes in supply chain management, through new types of suppliers or customers
   - Digitalisation of the processes
   - Training for staff (new green skills)
   - Training for staff (digital skills)
   - Time to market innovation
   - Internal and external communication review
   - Digital marketing tools
   - Incentives for smart working
   - Review of work processes

Part two: circular economy and digitalization

10. Compared to the average number of SMEs in the sector, how is the company integrated into a circular economy system?
    - Much less integrated
    - Less integrated
    - Equally integrated
    - More integrated
    - Much more integrated
11. What are the main drivers/enabling factors for the integration of the company into a circular economy system? Choose five of them and give them a score (1=least important; 5=most important).
    - The company's vision, based on untapped business opportunities
    - Technological developments in the manufacturing sector
    - Improved collection and use of business data
    - Legislative changes
    - Volatility of the prices of the means of production: materials, energy or mobility/transport
    - Lack of material inputs
    - Product competition on the market
    - Fiscal incentives
12. Of the barriers to adopting a circular system listed below, which are the most impactful for your company? Choose five and give them a score (1=least important; 5=most important).
    - Economic factor: unprofitable transition for businesses even if other barriers are overcome
    - Economic factor: high and/or uncertain recovery times
    - Economic factor: technology not yet available on a large scale at an economically advantageous cost
    - Economic factors: real production costs not fully in line with market prices
    - Economic factors: insufficient/deficient infrastructure provided by the market or public institutions
    - Economic factors: insufficient demand for the product, due to a higher price than for a "non-circular" product
    - Economic factors: fractional, insecure and discontinuous incentives
    - Economic factors: too high commitment to identify and negotiate with new suppliers and customers
    - Organisational factor: lack of suppliers or customers interested in the use of second raw materials
    - Regulatory factors: regulatory framework not defined
    - Regulatory factors: unclear policy objectives providing insufficient or distorted orientation to the production system
    - Regulatory factors: existing regulations that hinder circular economy practices
    - Social factors: skills lacking in internal organisation or market (at a fair cost)
    - Social factors: high cost of staff training or recruitment of highly qualified personnel
    - Social factors: deep-seated habits and patterns of consumer and business behaviour
13. Which of the following practices should be integrated into business processes from a circular economy perspective? Select the top five and give them a score (1=least important; 5=most important).
    - Use of secondary materials as a significant percentage of the total acquisition of tangible assets
    - Development and design of products and services considering the principles of circularity (modularity, reproducibility, reduction of material use, prolonged use of manufactured products)
    - Use of renewable energy sources
    - Provision of logistics services
    - Creation of a digital platform for the management of purchases and disposals of recyclable materials
    - Internal planning and inclusion of circularity principles in your business plan and future projects
    - Collaboration with circular economy research or consultancy organisations
    - Creation of a territorial network for the recovery and redistribution of secondary materials
    - Adoption of a process and/or product sustainability certification
14. Compared to the average of SMEs in the reference sector, the company is set within a context of digitalisation, in a way:
    - Much less
    - Less
    - Equally

- More
- Much more

15. Which digitalisation practice is most useful for the company's inclusion in a circular economy system? Please assign a score from 1 (least important) to 5 (most important).
    - Tracking the origin of raw and second materials (before acquisition, during production, after sale)
    - Ability to access services or infrastructure (such as online platform) for the reuse/recycling of the product or for the extension of its life cycle
    - Investments in digital technologies (Iot, remote control, smart metre, cloud systems, blockchain) to increase energy efficiency and circular potential
    - Data-driven approach (e.g., activity planning according to energy consumption analysis results)
    - Use of social/digital media/website to communicate vision, mission and company activities

16. Have you already experimented with one or more of the practices listed above in your company? If yes, which one?

INTERVIEWS WITH KEY PROJECT STAKEHOLDERS

1. How would you define the role of the cluster/your organisation in strengthening the resilience of SMEs in the Alpine region?
2. What are the system practices (tools and methods) that your organisation developed to introduce a circular economy system by the help of digitalization?
3. Which are the types of PMI that successfully apply digitalization tools in circular economy systems and which innovative tools are most used in the business sectors of your interest?
4. Could you give us an example of an organisation/SME that can be considered as a good practice in introducing circular economy innovations and using digititalization to facilitate its processes?
5. In your opinion, which are the contextual conditions (and currently missing) for an organisation/SME in your sector to be able to easily introduce circular economy tools through the help of digitalization?
6. What kind of training (or other services related to work organisation) is needed within an SME in order to move quickly towards the adoption of digital tools to support circular economy practices?
7. What are the system policies and resources (knowledge sharing, best practices, training) that companies, in particular small and medium-sized ones, ask policy makers or external stakeholders such as clusters, business networks or training/information centres?

INTERVIEWS WITH SMES THAT REPLIED TO THE QUESTIONNAIRE

1. What tools/practices have you adopted at the organisational level to respond to the pandemic crisis (or more generally to respond to the crisis situations you have faced)?
2. Have you adopted any innovative tools/practices in the area of digitisation or circular economy? If so, what are they and what were the reasons that prompted you to reorganise in this respect?

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The project aims at investigating the vulnerabilities and potentials of the socio-economic system of the EUSALP area, closely observing the dynamics that characterize the entrepreneurial fabric of the European macro-region. The concept of resilience is observed through different perspectives: the ability to innovate, to integrate circular economy and digitisation into production processes and to build a network of strong external relations. The report offers a broad snapshot of the EUSALP manufacturing system and a survey of the project themes from the perspective of key actors.