DOCUMENT TITLE:

REGIONAL MAPPING REPORT - AUSTRIA

Project: Improving RD and business policy conditions for transnational cooperation in the manufacturing industry

Acronym: Smart Factory Hub

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TARGET GROUP ASSESSMENT

Has this deliverable addressed any of the target group indicated in the application form?

Yes / **No**

If yes, please describe the involvement of each individual target group in the table below.

Target group	Number reached by the deliverable	Description of target group involvement
SME		
Regional public authority		
National public authority		
Higher education and research		
Business support organisation		

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1 Introduction

The objective of regional mapping is to provide insight into the current state of the manufacturing sector, particularly functioning of support environment in Austria, focusing on the region Upper Austria, Styria and Lower Austria, from which production oriented small and medium enterprises (SME) can benefit on a long term. In the following, the term “Austria” is used for the defined region: Upper Austria, Styria and Lower Austria.

The regional report is drafted by following common methodology, which includes the analysis of supportive environment for manufacturing oriented companies - particularly smart specialization measures, priorities, indicators, implementation schemes, instruments, emerging trends in the manufacturing sector, analysis of existing support ecosystems and analysis of the main regional actors. Moreover, the supporting institutions and available support services are highlighted, in order to determine possible inclusion of these institutions in a common hub, and thus offer complementary services to SMEs and other target groups.

This report is provided as a single report, similar to reports from other countries, where each partner delivered mapping covering its own region. As a result, regional mapping reports are prepared for Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Romania, Serbia, Slovakia and Slovenia.

After the introduction, Chapter 2 is providing strategic background for the Smart Specialization Strategy including top-down description of strategies and status of their evolution at a national level, background analyses supporting development of strategies and highlight Smart manufacturing topics.

Chapter 3 is presenting support environment by highlighting the support environment structure, detecting actors responsible for implementation of strategies and other supporting actors like clusters, technology parks, R&D centres, competence centres, University incubators, Business incubators.

Chapter 4 presents Smart Factory support schemes and programmes including list of currently available or future programmes, grants, loans, etc.

Chapter 5 provides national Smart Factory related projects in execution by the project partner or partnering organisations.

Chapter 6 presents list of regional actors relevant for area of Smart Factory whereas actors are grouped by relevance (User, Solution provider or User/solution provider)

2 Strategic background

Europe 2020 is the EU's growth strategy for the coming decade. In a changing world, we want the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion.

Concretely, the Union has set five ambitious objectives – on employment, innovation, education, social inclusion and climate/energy – to be reached by 2020. Each Member State has adopted its own national targets in each of these areas. Concrete actions at EU and national levels underpin the strategy.

National and regional authorities across Europe have designed smart specialisation strategies in entrepreneurial discovery process, so that the European Structural Investment Funds (ESIF) can be used more efficiently and synergies between different EU, national and regional policies, as well as public and private investments can be increased. This lead to the Austria's Partnership Agreement with the European Commission on the European Structural and Investments Funds 2014–2020 ("STRAT.AT 2020"). Through four national programmes, Austria has been allocated EUR 4.92 billion from ESI Funds over the period 2014-2020. With a national contribution of EUR 5.73 billion, Austria has a total budget of EUR 10.65 billion to be invested in various areas, from innovation, research and technological development to preserving and protecting the environment as well as promoting sustainable and quality employment, social inclusion and education and training.

As a high-income country, Austria can only secure and expand its competitiveness and quality as a location to the extent to which the transformation to a knowledge-based economy takes place. The prerequisite is an on-going intensification of the transfer process from science to the economy: newly created knowledge must find a shorter path to utilization. This means substantially increasing the scope and level of innovations that are developed and implemented in Austria.
The focus here should expand upon the Austrian economy's strengths and on the structural improvement of the Austrian manufacturing and service sectors in the direction of higher research and knowledge intensity; the expansion of innovation activities at all firms, especially in small- and medium-size enterprises (SMEs); stronger exploitation of the potential of creative industries; substantial increases in the level of innovation; and a significant improvement in financing by mobilising private equity and venture capital.

The Austrian federal government has declared that the objective is to reach a research intensity of 4% by 2020, and views this target as part of a vision that provides orientation.[1]

[1] https://era.gv.at/directory/158/attach/RTI_Strategy.pdf

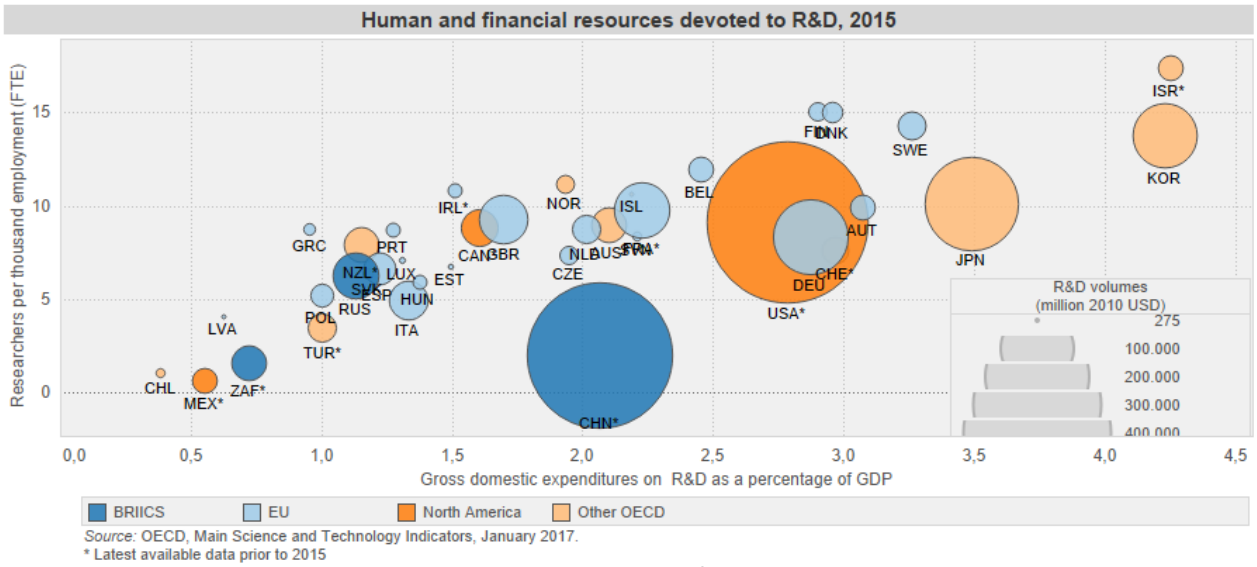


Figure 1: International comparison of R&D expenditure [2]

One of the great challenges of this strategy for the coming years is therefore, in addition to direct and indirect funding, to stimulate firms and research institutions by creating a situation that encourages innovation and promote more research. Private participation in the research intensity of 2020 should at least reach 66% and, if possible, 70%. The contribution of the public sector should, after the necessary phase of consolidation, be stabilised on a path where it can support the research intensity with this ratio of private and public research financing.

Global production is increasingly characterized by custom-designed solutions contained in products and related services requiring extremely flexible organization. The production processes and products need to match the most demanding technical and environmental standards. One of the key elements in the process, from knowledge production, development to manufacture and marketing, is enabled by the information and communication technologies. It not only supports the integration and optimization of working processes and machines in individual factories but also the integration and optimization of the processes of the entire production chains irrespective of the location.

The economic performance of Austria strongly depends on its manufacturing industry. The ability to manufacture internationally competitive products and to increase productivity is key to the economic growth of Austria as a highly industrialised and knowledge based country. And Innovations in the manufacturing sector will continue to be an indispensable basis for added value and employment in the future.

Competitive manufacturing in Austria is also based on a high level of technology. Smart production – the blend of information and communication technologies (ICT) with industry – is the

[2] http://www.oecd.org/innovation/inno/researchanddevelopmentstatisticsrds.htm

new premise for manufacturing. Innovative, cost saving, eco-friendly, and qualitative products and services can only be produced with innovative manufacturing. Industry 4.0, or Advanced Manufacturing, is therefore of critical importance

Innovative technologies, processes, and new materials are key issues for the industry of the future. To retain manufacturing in Austria and to secure a high level of competence and competitiveness in the long term, an excellent research environment is a necessity. Knowledge of current industry trends at universities will be advantageous for tomorrow's production. Therefore, the Austrian government started a research, development, and innovation (R&D&I) initiative.

- Production of the future - Research and Technology initiative
- Flagship Project for Assistance systems
- Pilot Factory for Industry 4.0.[3]

The Association Industry 4.0 Austria - The Platform for Smart Production - was established to foster collaboration among all stakeholders and facilitate new technological developments and innovations in the context of digitization ('Industry 4.0') and thereby to find sustainable solutions to challenges faced by companies, research institutions and society as a whole.

The Platform facilitates the implementation of digital transformation in Austria and unifies the Industry 4.0 community. It aims to secure and create highly innovative industrial production and to boost quality employment, thus strengthening Austria's future competitiveness.

There are 7 working groups of the Platform Industry 4.0 in the field of:

- Smart logistics
- Pilot factory
- Norms & Standards
- Research, Development and Innovation
- The Human in the digital factory
- Qualifications and skills
- Regional strategies

2.1 Structure of RTI governance system

Strategy for research, technology and innovation (RTI) of the Austrian Federal Government is the key strategic document of the Government of the Republic of Austrian in the field of innovation. S3 shall serve as the basis for Austrian development policy.

[3] http://ostaustria.org/bridges-magazine/item/8312-production-of-the-future-advanced-manufacturing-in-austria

The Austrian Federal Government launched its Strategy for Research, Technology and Innovation for the next decade on 8 March 2011. According to its motto "Realising Potential, Increasing Dynamics, Creating the Future: Becoming an Innovation Leader", the strategy addresses measures to strengthen national research structures with a focus on excellence, to foster the innovative capacity of companies, allow for thematic priority setting, raise the efficiency of governance, and link research, technology and innovation to the education system. The strategy should also help to mobilise research, technology and innovation for the grand challenges of society and the economy.[4]

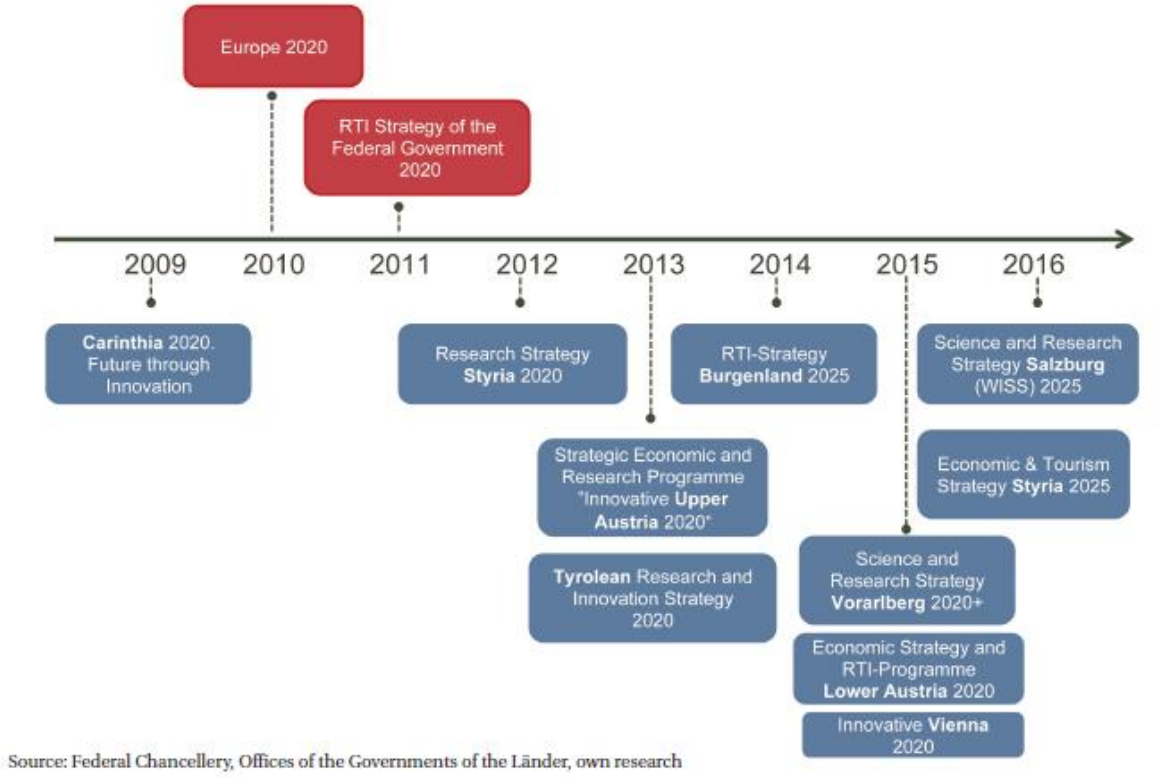


Figure 2 RTI Strategy of Austria[5]

The following table presents an overview of the regional thematic priorities and their correspondence with the national thematic priorities. It is clearly seen, that production technologies play a significant roll in all regions. In these report specially the situation in Upper Austria, Lower Austria and Styria is considered.

[4] https://era.gv.at/directory/158

[5] http://www.oerok.gv.at/fileadmin/Bilder/3.Reiter-Regionalpolitik/2.EU-Kohaesionspolitik_2014_/Nationale_Strategie_STRAT.AT2020/Policy_framework_for_smart_specialisation_in_Austria__OEROK-SR_Nr_199_EN_web_.pdf

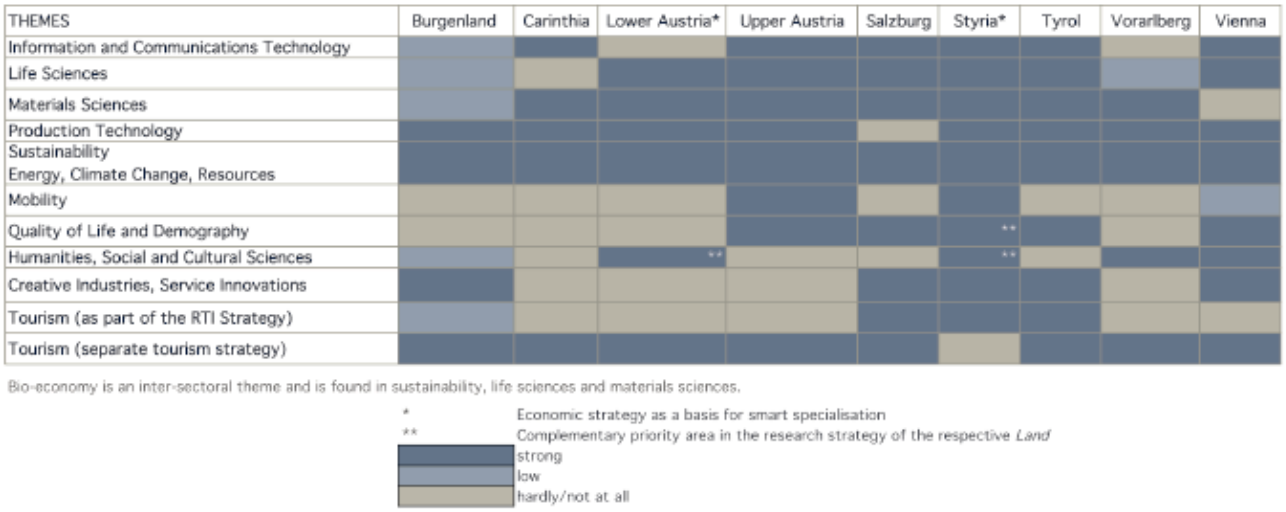


Figure 3 Priorities of the federal states (Länder) of Austria[5]

The following section presents the regional **strategy priorities** of the Upper Austria, Styria and Lower Austria.

2.2 Innovative Upper Austria 2020

Upper Austria as an industrially-dominated Region has worked intensely in the past 25 years on a location policy to build up a specialised regional innovation system, and in this context, it has promoted mainly research and educational capacities.

The strategic economic and research programme "*Innovatives OÖ 2020*" ("Innovative Upper Austria 2020") consistently follows the innovation chain education-research-business, and pursues a productivity-oriented growth strategy.
Upper Austria, as a Demonstrator Region for Service Innovation (within the ESIC Initiative) has focused on innovation in services to accelerate the industrial renewal process and to achieve a higher level of competitiveness over the long term. The development strategy was monitored by the Council for Research and Technology for Upper Austria (*Rat für Forschung und Technologie für Oberösterreich, RFT OÖ)* and was adopted by the federal government and the Land parliament.

The RIS 3 centred model in Upper Austria is based on the strategic **STRATEGIC ECONOMIC AND RESEARCH PROGRAMME – Innovative Upper Austria 2020. This is the key strategic document of the Government of Upper Austria in the field of innovation.**

This program has defined 5 fields of Activity and the field "Industrial production process" is strongly related to the SMART Factory HUB Focus of Industry 4.0.
The program is available under:
http://www.ooe2020.at/fileadmin/user_upload/Projektwebsites/ooe2020/Downloads/Programmbuch_englisch.pdf

Figure 4: Innovative Upper Austria Strategic Economic and Research programme

Upper Austrians National/Regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies) is based on four Core Strategies including three main stakeholders from research, education and economy along the Value Chain. Five fields of activities are in the focus of the strategy.

Core Strategies:

Four defined core strategies - **location development, industrial market leadership, internationalisation** and **future technologies** – form the basis of the strategic economic and research programme "Innovative Upper Austria 2020", which has a total programme amount of 1.35 billion Euro from 2014 to 2020.

The guiding principle "strengthen strengths – dare something new" is upheld in order to further develop the location Upper Austria and to improve its competitive advantages. The consequent focus on the defined fields of action and the increased cooperation between business and science creates the preconditions to timely address global future topics and to develop innovative technologies. The international cooperation with other regions and the formation of long-term strategic alliances lead to high excellence in research and thus further strengthen the attractiveness of the economic and research location Upper Austria

Strategic objectives, educational policy objectives, research policy objectives and economic policy objectives are defined in the program for each field of activity with topics/measures for each objective. This enables are monitoring of the objectives and the objective is very clear.

2.2.1.1 Industrial production processes is one of identified priority areas in the RTI Strategy

The key to securing the region's current international position and high earnings lies primarily in the continuous further development of regional production. Overall economic productivity can be increased through technological and organisational improvements in industrial manufacturing processes. In particular, offering industrial services along with products and process technology should be given special attention.
The field of activity "Industrial Production Processes" is clearly represented by strong and dynamic companies, and is therefore especially favourable for the pursuit of a "front-runner strategy". Almost without exception, the industry sectors relevant to this focal point achieve foreign trade surpluses and, through their production and research orientation, a majority also demonstrate regional specialisation as well as a head start in growth compared to the rest of Austrian industry.
Some key fields such as **mechatronics, process automation, materials and ICT** were already identified as clear focal points in the previous Strategic Programme. The challenge now is to combine these sectoral strengths and to develop excellence and critical mass. Supporting and building up research is of special significance in order to launch a greater number of radical innovations

Example for Strategic objectives are f.e.: In 2020, Upper Austria is to be a leading European industrial region, withstanding the pressure of globalization through competitive products and services and TOPICS/MEASURES are:

- Manufacturing region 2050 – Industry 4.0 for Upper Austria
- Positioning of Upper Austria as a leading industrial region in the European Economic and Research Area (EU Strategy 2014 to 2020

ORGANISATIONAL IMPLEMENTATION/ ONGOING PROCESSES:
This important topic is also an element of the Upper Austrian strategy and is an ongoing process. Roles and responsibilities during programme implementation, financial volume of the programme interim evaluation 2016, indicators, annual control and steering cycle at programme and policy levels and the process of project submissions are key points of the RIS3 centred innovation Hub in Upper Austria.

Aiming for a fast and efficient work, Upper Austria used a top down and bottom up method to foster the topics. The organizational structure can be see in the next figure[6]:

[6] http://www.ooe2020.at/das-programm/die-akteure/

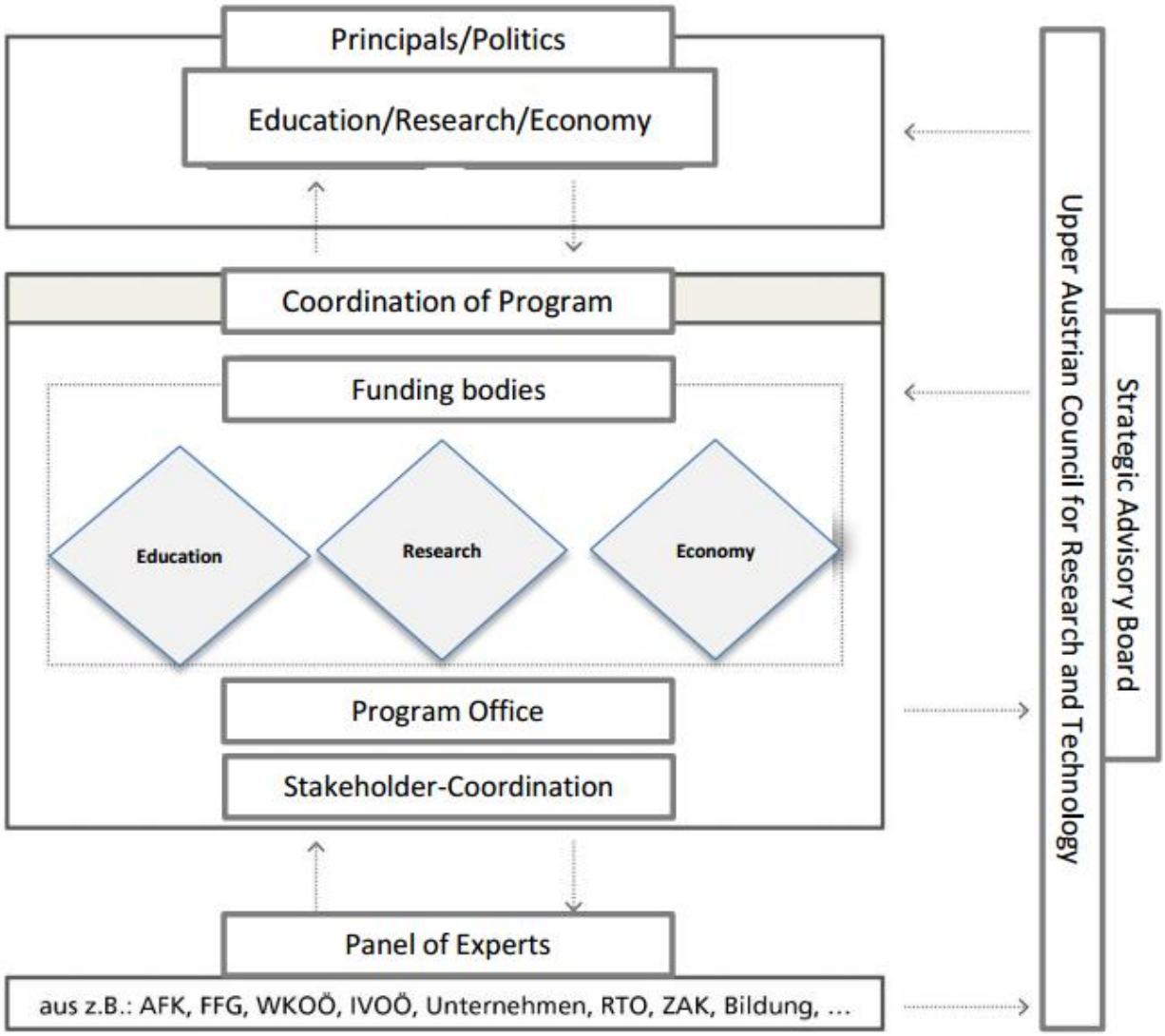


Figure 5 Organisational Structure – Upper Austria[7]

2.2.2 Economic Strategy Lower Austria 2020

Lower Austria began the reorientation of its regional innovation policy when it started participating in the EU RIS Initiative and has stayed on this course of international exchange activities over the past one and- a-half decades. The implementation of the strands “Innovation & Technology” are defined in Lower Austria’s innovation pyramid. The technology and innovation partnership serves

[7] https://era.gv.at/object/document/3251/attach/Upper_Austria_presentation_BLD_20170228.pdf

as basis and is aimed at mobilizing existing innovation potential to support (all) companies with potential, strengthen their competitiveness through innovation, and achieve modernisation and structural change, for example, through new key technologies. Clusters are created to initiate – thematically-focused – leading cooperative and international R&D projects in the fields of the future. With the creation of "Technopoles", location development follows clearly-defined technology fields at the confluence of science, economy and higher education. The aims are to achieve critical mass, international visibility and location development. In accordance with this concept, thematic areas of specialisation are created within the clusters. Currently defined areas: environmentally-benign construction, food, plastics and mechatronics. The priorities at the Technopoles for research which concentrate on excellence and critical mass are on medical biotechnology (Krems), agricultural and environmental technology (Tulln), bio-energy, agriculture and food technology (Wieselburg), and medical and **materials technologies** (Wiener Neustadt).

2.2.3 Economic and tourism strategy for Styria 2025 Growth through Innovation

Styria is an industrially-dominated region with a research ratio of 4.8%, making it one of the most research- intensive regions of Austria. The innovation strategy in the meaning of intelligent specialisation is represented by the scheme "Economic and Tourism Strategy Styria 2025 – Growth through Innovation" (*Wirtschafts- und Tourismusstrategie Steiermark 2025 – Wachstum durch Innovation*). It is oriented on applied research and promotes the areas of confluence of science and business, especially through COMET Centres. The strategy of the Land Styria to promote science and research complements this objective and concentrates on the science system and thus also covers the relevant elements of basic research. Styria therefore pursues the ambitious goal of becoming a real benchmark for change for a knowledge-based production society in the EU. In this context, the aim is to support innovation dynamic of the leading companies, integrate more companies into the innovation processes, and enlarge the focus to include services. The key market-driven themes are (i) mobility, (ii) green-tech, (iii) health-tech. These are supported by the core technology competencies: materials technology, production technology, machinery and plant engineering, digital technology and microelectronics. The creative industries are positioned as "innovation supporters". In the collaboration of the actors in the clusters along the knowledge triangle, detailed strategies were defined for the key themes in an "entrepreneurial discovery process".[8]

2.2.4 International dimension

Austria lies in the alpine region of the current and the future EU macro-regional strategies, namely the EU-Strategy for the Alpine Region (EUSALP) and EU Strategy for the Danube Region (EUSDR).[9]

[8] http://www.oerok.gv.at/fileadmin/Bilder/3.Reiter-Regionalpolitik/2.EU-Kohaesionspolitik_2014_/Nationale_Strategie_STRAT.AT2020/Policy_framework_for_smart_specialisation_in_Austria__OEROK-SR_Nr_199_EN_web_.pdf

International partnerships have already been established, in particular through active involvement in platforms such as European Technology Platforms (ETP) like EFFRA and SPARK (euRobotics), COST or EUREKA,. Austrian Ministry for Transport, Innovation and Technology (BMVIT) coordinates the both ERA-Net-Cofund Acitivities Smart Cities and Communities (ENSCC) and Smart Grids Plus. The Austrian Research Promotion Agency (FFG) is responsible for ERA-NET Co-funds Materials Research and Innovation (M-ERA.NET 2) und PhotonicSensing. [10]

Links with similar clusters in Central European countries (Austria, Poland, Czech Republic, Slovakia and Hungary) and the Balkans (Croatia, Serbia, Romania, Bulgaria) have also been established. Such links will serve as the basis for cooperation, in particular in the framework of territorial cooperation projects.

[9] https://www.alpine-region.eu/eu-macroregional-strategies
[10] https://www.bmvit.gv.at/innovation/publikationen/technologieberichte/downloads/ftb_2017.pdf

3 Support environment

Supporting institutions for business oriented SMEs are chambers of commerce, chambers of crafts, centres of excellence, research centres, development centres, competence centres, technology centres, technology parks, incubators and other operating in the eligible program area.

All these institutions promote the emergence of new competitive companies that promise high added value and equitable regional development. Incubators support the realization of entrepreneurial ideas, the creation and development of enterprises, stimulating environment, subsidised leases of premises and administrative, intellectual services and other services for its tenants. Technology parks in one location bringing together business development, research and operations of new technology companies, its members while offering a supportive environment consultancy, easy exchange of information, transfer of knowledge, the necessary infrastructure and the like.

Key Players:
Key Players for the implementation are from govern Organisations (UAR, BIZ), Universities and Non University Research and from the Industry. The stakeholders are described below.

3.1 Clusters

Clusters represent a form of informal networking among businesses and other organizations in the sector in a given geographical area, which offers plenty of benefits of cooperation. Connectivity is based on common interests, the basic idea of clustering is based on cooperation, including companies that have market competition, which is somewhat illogical, but understandable since it is a common interest in development cooperation, transfer of knowledge and the development of new competences.

Organizational forms of business clusters are different and depend on each cluster, scope and content. All clusters have in common is that it is a common entrepreneurial activity in a particular environment, focused on the broader global market. Companies within the cluster are specialized and complementary but competing at the same time. In this way may be associated companies acquire larger and more complex transactions that create higher added value and increase their visibility in the market. Membership and participation in the cluster of micro, small, medium and large companies makes contact with partner organizations abroad. These may be companies, institutes, universities and other organizations of interest in terms of members. Organizations and individuals to find themselves in a network of international projects and partners from all over Europe or even the world's countries.

The objective of fostering the entrepreneurial clusters is to strengthen the infrastructure established at local, regional, national and international level and support the identified clusters at a certain level. Cooperation in research and development projects, the members of the cluster enables learning, networking and the development of competencies. Companies can spend a lot of time developing and training, participate in workshops, development and innovation of business models and the like. For micro, small and medium-sized enterprises means integration into clusters, a good opportunity and solution to consolidate its position in the domestic market and the penetration of foreign markets. Affected companies easier to overcome challenges in the areas of foreign market entry, promotion, marketing, take on larger and more complex transactions, investments, technological development, and so on.

In Europe, there are more than 2,000 different industrial clusters, of which there are about 150 of those who are among the leaders in the world in terms of focus, specialization, size and employment. Around 40% of European jobs is based on clusters; and clustering of micro, small and medium-sized enterprises leads to more innovation and growth.

In Austria following **clusters** in the field of Smart Factory are existing[11]:

1. Plastic Cluster Upper Austria
2. Plastic Cluster Lower Austria
3. ACStyria
4. Mechatronics-Cluster Upper Austria
5. Mechatronics-Cluster Lower Austria
6. Cleantech-Cluster
7. Automotive Cluster
8. Network Human Resources
9. IT Cluster
10. ARGE Plattform Automatisierungstechnik Steiermark
11. Green Tech Cluster Styria GmbH
12. Materials Cluster Styria

Furthermore there are following **technology networks** existing:

1. Platform Industry 4.0
2. Technology and Innovationmanagement (TIM)
3. Technologie- und Innovations Partner (TIP)
4. Zukunftsakademie Mostviertel
5. VPTÖ
6. RIC (Regional Innovation Center)
7. Der Technopol für Moderne Industrielle Technologien

[11] https://www.wko.at/service/innovation-technologie-digitalisierung/Cluster-und-Netzwerke.html

3.2 Centres of excellence for science

Centres of Excellence are a measure within the framework of the scientific and technology policy of the Republic of Austria aimed at promoting the concentration of knowledge at priority technological areas and horizontal linking along the entire chain of knowledge development, which is realised on the basis of strategic partnerships between the private sector and academia.

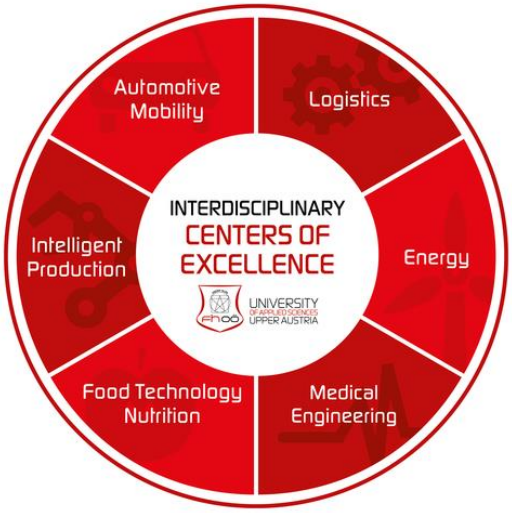
The Centers of Excellence related to Smart Factory HUB is presented below:

1. Institute of Science and Technology Austria (IST Austria) - https://ist.ac.at/en/

The Institute of Science and Technology Austria (IST Austria) is a young international institute dedicated to basic research and graduate education in the natural and mathematical sciences, located in Klosterneuburg on the outskirts of Vienna.
IST Austria is committed to conducting world-class research. By 2026, up to 90 research groups will perform research in an international state-of-the-art environment.[12]

3.3 Center of Excellence for applied science

In accordance with the priority areas of the strategic programme „Innovative Upper Austria 2020“ – industrial production processes, energy, health/aging population, food/nutrition and mobility /logistics Centers of Excellence have been implemented in order to meet the requirements of the strategic programme.



[12] https://ist.ac.at/en/

2. **Center of Excellence Smart Production**

The production platform supports the Institute for Intelligent Production which deals with various relevant research topics in the field of intelligent production such as the exploration of models for the use of distributed intelligence, the development of innovative approaches in modelling, simulation and optimization or 3D printing or rapid prototyping.[13]

3.4 Competence centers

The competence centres are defined as development and research centres that are managed by partners from industrial sector and link partners from the industry and public research sector; they focus on the promotion of the development capability and the application of new technologies in manufacturing new competitive products, services and processes at priority areas of technological development. This function is complementary to that of the centres of excellence; together they constitute an autonomous whole in the area of research and development.

The national programme COMET (Competence Centers for Excellent Technologies) was launched in 2006. The competence centres programmes are internationally recognised as best-practice model and have been among the most successful technology policy initiatives in Austria. An overview about existing centres could be found at https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/20161129_comet_overview_centresprojects.pdf

There are some relevant centres related to Smart manufacturing like:

- ACCM - Austrian Center of Competence in Mechatronic
- ASSIC (CTR continued) - Austrian Smart Systems Integration Research Center
- Know-Center (continuation) Know-Center - Research Center for Data-driven Business

1. **Competence Centre - •ACCM - Austrian Center of Competence in Mechatronic (LCM GmbH)**
   Total costs: EUR 63,0 Mio (5 years) - FP2: 01.01.2013 - 31.12.2017 (5 years)

Retroactively with 01.01.2013 the ACCM GmbH has been integrated into LCM and is now the K2 part of LCM GmbH.
The goal of the competence excellent is to develop mechatronic for innovative processes and products: Areas are:

- Process Modelling and Mechatronic Design
- Mechanics and Model Based Control

[13] https://forschung.fh-ooe.at/en/centers-of-excellence/

- Information and Control
- Drives and Actuators
- Wireless Systems[14]
- Sensors and Signals[15]

2. **ASSIC (CTR continued) - Austrian Smart Systems Integration Research Center**
   Total costs: COMET K1 3rd Call: EUR 18.4 Mio (4 years, 1st funding period)

Micro- and nano-electronic components and systems are essential to modern digital products and services. Mastering the technologies of smart systems integration is thus becoming a key issue for the future of Europe's economy. ASSIC targets a holistic R&D approach from single components to complete system solutions. Concrete outcomes comprise the

- development of components, micro-modules and integrated smart systems demonstrating increased functionality and advanced performance
- development and optimisation of related process technologies for microsystem device and packaging manufacturing
- development and refinement of tools and methods for design and integration of smart systems[16]

3. **Know-Center (continuation) Know-Center - Research Center for Data-driven Business**
   Total costs: COMET K1 3rd Call: EUR 20.4 Mio (4 years, 1st funding period)

The competence center approaches data-driven business as a cognitive computing challenge in order to establish Austria's focal point for data-driven business and big data analytics. The scientific strategy integrates Knowledge Discovery, Social Computing, Ubiquitous Personal Computing and Knowledge Visualization to create cognitive computing systems which enable humans to utilize massive amounts of data.

New established Centres in 2016/2017:
Seven centres were selected of the K1-Centres 4th Call within a public invitation to tender for the development of competence centres in 2017–2013. Three of them are relevant in the field of the SMART Factory of the future:

- VRVis K1 Centre for Visual Computing

[14] https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/comet_k2-factsheet_accm_en_2014_1.pdf (accessed on 18.05.2017)
[15] http://www.lcm.at/en/company/competence-center/ (accessed on 18.05.2017)
[16] https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/comet_k1_call3_factsheet_assic_en_0.pdf (accessed on 18.05.2017)

- CDP - Austrian Center for Digital Production
- Pro2Future

4. **Competence Centre - CDP - Austrian Center for Digital Production**[17]
   Total costs: COMET K1 4th Call: EUR 17.3 Mio

The fourth industrial revolution will require manufacturing companies to support a seamless integration of all process steps including automation, control and documentation. Therefore, the envisaged centre will cover all process steps ranging from acquisition to delivery: The virtualisation of product and production systems allows for a comprehensive product specification and a reliable process planning. The (further) development of design automation accelerates not only the design process but also the work planning. Standardised protocols for machine-to-machine communication support the implementation of flexible and reconfigurable automation systems, which by the support of flexible and intelligent clamping and tool systems are effective also for small lot sizes and facilitate fully automated operations. Digital platforms and networks for production allow the dynamic formation of virtual smart factories enabling low tier manufacturers to provide a combined and therefore value-added service.

5. **Competence Centre — Pro²Future – Products and Production Systems of the Future**18
   Total costs: COMET K1 4th Call: EUR 17.3 Mio

Pro2Future attempts for next generation products and manufacturing machinery (holistically combining batch and continuous process industries), with embedded cognitive capabilities so as to perceive, understand, interpret, learn, reason and deduce, and act in an autonomous, self-organized way together with humans. This includes three major scientific areas, each taken from foundational and goal-oriented research disciplines related to cognitive systems, namely (i) Perception and Aware Systems, (ii) Cognitive Robotics and Shop Floors and (iii) Cognitive Decision Making, ultimately delivering the technological underpinning of (iv) Cognitive Products and (v) Cognitive Production Systems.

17 https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/comet_k1_call4_factsheet_cdp_en_final.pdf (accessed on 18.05.2017)

18 https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/comet_k1_call4_factsheet_pro2future_en_final.pdf (accessed on 18.05.2017)

6. Competence Centre VRVis K1 Centre for Visual Computing[19]

Total costs: COMET K1 4th Call: EUR 20.4 Mio (4 years, 1st funding period)

Good and correct decisions are the basis for success. In 2025 we will be able to use visualization and further human senses and output modalities beyond the desktop to enable effective and efficient workflows for applications requiring the human in the loop. We will have increased decision confidence based on complex data from e.g. medicine, environment, production, development and IoT in the presence of uncertainty while overcoming analytical limitations imposed by volume, velocity and variety of data. VRVis will provide with its more than 70 researchers expertise and research capabilities in order to transfer disruptive and innovative 3D technologies to our partners, and perform internationally renowned research.

3.5 Research centres

The research centres are institutions aimed at exploring, normally a specified area. Carry out basic and applied research, including using non-traditional techniques. They establish by many universities, with a view to implementing the specific research and educational activities. Most research centres demonstrates the scientific results of their work.

A success factor in Upper Austria is the **Innovation Network Upper Austria**. Upper Austria has a number of facilities in the fields of research and development and technology transfer which are interlinked in the Upper Austrian Innovation Network. The Johannes Kepler University (JKU), the Applied Sciences Research & Development GmbH of the Universities of Applied Sciences in Upper Austria, the Upper Austrian Research GmbH together with its subsidiaries (one of them is the project Partner PROFACTOR) and the competence centres of the Austrian Research Promotion Agency (FFG), have greatly augmented research performance in Upper Austria during the last years. All in all, the Innovation Network Upper Austria comprises more than 80 facilities (universities, competence centres, non-university research centres, research facilities of the Upper Austrian industry, technology and start-up centres as well as continued education and training centres) and is coordinated and further developed by Business Upper Austria.

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https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/comet_k1_call4_factsheet_vrvis_en_final.pdf

Figure 6: Research and Innovation Landscape in Upper Austria | Source: UAR

Business Upper Austria: The Upper Austrian Business Agency called Business Upper Austria offers support concerning the topics technology transfer from science to business – in particular for small and medium-sized enterprises (SMEs) – as well as professional advice for claiming regional, national and European innovation and research grants. Its services include the ever more important field of property rights protection. Business Upper Austria makes an enormous contribution towards the rapid diffusion of knowledge regarding new technologies or best practice examples in one branch for the benefit of the most important economic sectors in Upper Austria. In addition to the Upper Austrian Business Agency, 21 impulse and technology centres in all regions of Upper Austria as well as other research and educational facilities contribute to the widespread transfer of technology to Upper Austrian companies. (www.biz-up.at).

Upper Austrian Research: The Upper Austrian Research GmbH (UAR) is the leading agency for research promotion in Upper Austria and supports the state of Upper Austria in the field of research policy – above all in the areas strategy, project development as well as coordination, internationalisation, creation of strategic alliances and marketing. The UAR is the central agent for research in Upper Austria and offers support as hub and facilitator for research facilities. By holding shares in renowned research centres, the UAR has built and continuously extends a strong network in the field of non-university research. The strength of the UAR and its subsidiaries lies in the close linkage of research and business.
Together with companies, it develops innovative hightech solutions and thereby incorporates latest research results, procedures and services into the projects thanks to the cooperation with universities and other research facilities. This economy and market-oriented innovation process creates a decisive advantage (www.uar.at).

Selected research Centers in Upper Austria:

Upper Austrian Research GmbH, a subsidiary of OÖ Landesholding GmbH, is a shareholder in internationally renowned Research centers. The joint ownership of leading research centers by Upper Austrian Research GmbH, Johannes Kepler University Linz, the University of Applied Sciences Upper Austria and other partners from science and industry means that the very latest research findings are constantly incorporated into the innovation projects. This gives the companies the decisive edge. Research Centres relevant for SMART Factories are:

- LCM - Linz Center of Mechatronics GmbH
- PCCL - Polymer Competence Center Leoben GmbH
- PROFACTOR GmbH
- RECENDT Research Center for Non Destructive Testing GmbH
- RISC Software GmbH

Other R&D Center in Austria are:

- AIT Austrian Institute of Technology GmbH
- evolaris next level GmbH
- Fraunhofer Austria Research
- JOANNEUM RESEARCH
- Kompetenzzentrum - Das virtuelle Fahrzeug
- Salzburg Research

3.6 Technology parks

Technology parks are institutions that provide the concentration of knowledge, high technology, education and interaction with national and global institutions. They connect professionals and entrepreneurs who wish to realize their economic goals, which are based on new technologies. Similar to the business park whose primary objective is to business and production, technology parks, but the focus is on the development and scientific research activities. They set up mainly in the vicinity of higher education institutions and development centres and are attractive for top professionals, but also for young talents who want to improve and educate.

Table 1: Technology parks

Country	Name	Institution type	Adress	Webpage links
AT	Softwarepark Hagenberg	Technology park	Hagenberg	http://www.softwarepark-hagenberg.com/
AT	Lakeside Park	Technology park	Klagenfurt	http://www.lakeside-scitec.com/

3.7 University and Business incubators

The primary purpose of the incubators is to increase the potential for growth and survival of young firms by providing modular buildings, common technical infrastructure, managerial support and other support services. Business incubators are support organizations that assist in the creation, speeding up and long-term performance of the companies in that they provide space for the operation, advisory services, and opportunities for networking and collaboration with other companies.

University incubators in Austria are presented in Table 2.

Table 2: University incubators

Country	Name	Institution type	Adress	Webpage links
AT	Science Park	University incubator	Graz	http://sciencepark.at/
AT	akostart	University incubator	Linz	http://www.akostart.at/
AT	TUW i2nkubator	University incubator	Vienna	http://i2c.ec.tuVienna.ac.at/

In Table 3 Business incubators in Austria are presented.

Table 3: Business incubators

Country	Name	Institution type	Adress	Webpage links
AT	Business Upper Austria	Business incubator	Linz	https://www.biz-up.at/
AT	tech2b	Business incubator	Linz	http://www.tech2b.at/
AT	Wirtschaftspark Liezen	Business incubator	Liezen	www.wirtschaftspark-liezen.at
AT	ESA Business Incubation Center (BIC)	Business incubator	Graz	ESA BIC Austria
AT	Accent	Business incubator	Viennaer Neustadt	http://www.accent.at/home.html
AT	RIZ	Business incubator	Lower Austria	www.riz.at
AT	Zentrum für angewandte Technologie Leoben GmbH	Business incubator	Leoben	www.unternehmerwerden.at
AT	accent Gründerservice GmbH	Business incubator	Viennaer Neustadt	www.accent.at
AT	CAST Gründungszentrum GmbH	Business incubator	Innsbruck	www.cast-tyrol.com
AT	build! Gründerzentrum Kärnten GmbH	Business incubator	Klagenfurt	www.build.or.at
AT	INiTS Universitäres Gründerservice Vienna GmbH	Business incubator	Vienna	www.inits.at

Table 4 and Table 5 are presenting other Smart Factory relevant organisations in Austria.

Table 4: Business support organisations

Country	Name	Institution type	Adress	Webpage links
AT	Business Upper Austria - OÖ Wirtschaftsagentur	Business support organisation	Linz	https://www.biz-up.at/
AT	Ecoplus - Business Agency of Lower Austrian government	Business support organisation	St. Pölten	https://www.ecoplus.at/
AT	TIC	Business support organisation	Steyr	http://www.tic-steyr.at/tic-steyr
AT	Zukunftsakademie Mostviertel	Business support organisation	Amstetten	https://www.zukunftsakademie.or.at/
AT	VPTÖ	Business support organisation	Steyr	www.vptoe.at
AT	WKO	Business support organisation	Vienna	https://www.wko.at/
AT	Steirische Wirtschaftsförderung (SFG)	Business support organisation	Graz	https://www.sfg.at/
AT	Plastic Cluster	Business support organisation	Linz, St. Pölten	http://www.kunststoff-cluster.at/en/
AT	ACStyria	Business support organisation	Raaba-Grambach	http://www.acstyria.com/en/
AT	Mechatronics-Cluster	Business support organisation	Linz, St. Pölten	http://www.mechatronik-cluster.at/en/
AT	Automotive Cluster	Business support organisation	Linz	http://www.automobil-cluster.at/
AT	Network Human Ressouces	Business support organisation	Linz	http://www.netzwerk-hr.at/
AT	Technologie- und InnovationsPartner	Business support organisation	St. Pölten	http://wko.at/noe/tip/
AT	TIM Technology and Innovationmanagement	Business support organisation	Linz	http://www.tim.at/
AT	IT Cluster	Business support organisation	Linz	http://www.itcluster.at/
AT	UAR	Business support organisation	Linz	www.uar.at
AT	BIZ-UP	Business support organisation	Linz	https://www.biz-up.at/
AT	Eco-Plus	Business support organisation	Viennaer Neustadt	https://www.ecoplus.at/
AT	Plattform I4.0	Business support organisation	Vienna	http://plattformindustrie40.at/?lang=en
AT	TEchCenter	Business support organisation	Linz	http://www.techcenter.at/
AT	Technology and impulse centres	Business support organisation	OÖ	https://www.biz-up.at/en/location-upper-austria/technology-and-impulse-centres/

Table 5: Ministries and governmental bodies

Country	Name	Institution type	Adress	Webpage links
AT	Austrian Ministry for Transport, Innovation and Technology	Ministry/Government	Vienna	https://www.bmvit.gv.at/en/index.html
AT	Federal Ministry of Science, Research and Economy (BMWFW)	Ministry/Government	Vienna	https://www.en.bmwfw.gv.at/Seiten/default.aspx
AT	Austrian Research Promotion Agency (FFG)	Ministry/Government	Vienna	www.ffg.at

4 Smart Factory support schemes and programmes

4.1 Financial environment

Favourable financial environment is very important for development of each company. The importance is also reflected by the fact that the financing of SMEs one of the main topics of the discussions, documents and programs on entrepreneurship both at EU level as well as at the level of Austria, as a small business, despite its importance for the economic development of countries and regions often face great difficulty in obtaining finance.

Debt capital is the most common source of financing for SMEs. The most common form of debt capital are bank loans (short, medium, long term). A characteristic of debt capital is also that providers of debt capital does not interfere in the management of the company.

In the context of equity capital for start-ups are the most common private investment. Private investments are instances when an entrepreneur to obtain capital from other small entrepreneurs to realize their ideas. Among the permanent capital may also include investment by business angels (Glas 2000 345). Business angels, entrepreneurs apart from financial investments also help with their knowledge, experience and social capital.

Venture capital is particularly suitable for companies that have high growth potential and innovative or high-tech products. Venture capital is the permanent capital since an investor becomes a co-owner of the company. Investors tend to assist in the management, because you want a fast growing company, which will bring huge profits, which will also pay for their risk. There are many venture capital funds, which in Europe combine in the European Venture Capital Association (EVCA).

Republic of Austria also has a very important role in the financing of SMEs since through successful SMEs the state can ensure effective economic development and strengthen its competitive advantages. The forms of government financial aid include loans, state guarantees, grants in the form of interest rate subsidies, export incentives, funding for product development and similar. The state can also set up venture capital funds. Apart from state support, also EU support plays a major role in the financial environment since European Union provides various grants, loans and guarantees to SMEs in the Member States.

4.2 Austrian RTI Support measures

The RTI strategy of Austria defines five closely related pillars as the basis for operational measures:

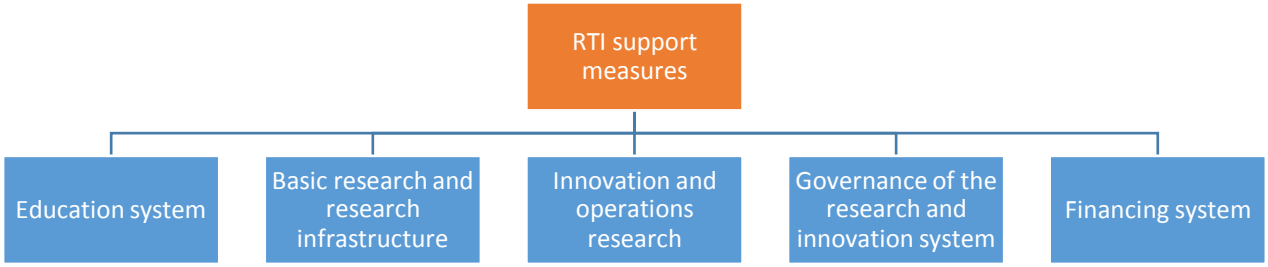

Figure 7: RTI - Support measures[20]

4.2.1 Education system

Education is the foundation of knowledge-based economies and makes an essential contribution to the social and economic development of our society.
The findings of numerous studies and international benchmarking suggest that the Austrian education system is not exploiting its full potential. Only 39% of an age group in Austria acquire a university entrance certificate (through a school-leaving examination); the OECD average is 61%. With an academic ratio of 34.6% – defined as the proportion of people with tertiary or equivalent post-secondary education in the 30-34-year-old resident population – Austria is below the EU average of 38%. In Austria, only 43% of each age group enrol in a course of

Support measures

- Structural reform of the education system
- Improve educational transitions
- Increase mobility
- Improve conditions for researchers at universities
- Strive for gender equality in research

[20] https://www.bmvit.gv.at/en/innovation/policy/

4.2.2 Basic research and research infrastructure

Basic research is a key area of the government's responsibility in research and innovation policy. In common with all highly developed industrialised countries, basic research in Austria is also funded overwhelmingly by the public sector. Therefore basic research plays a major role in the federal government's strategy for research, technology and innovation.

The quality of research is determined by

- basic research manly done at universities
- non-university research institutes
- research infrastructure

UNIVERSITIES AND BASIC RESEARCH

In international comparison, basic research in Austria – both in terms of monetary inputs and outputs (publications, quotations, etc.) – is located in middle field; however, it is lagging behind the global benchmarks, such as the USA and European reference countries.

Support Measures:

- Develop an "Austrian model" for future distribution of financing to universities based on student-related functions (teaching) and research
- Expand third-party financing of university research via Austrian Science Fund (FWF) projects evaluated in competition, with lumpsum coverage of 20% of overheads
- Implement an Austrian excellence initiative, by creating up to ten Clusters of Excellence by 2020
- Develop performance agreements into an instrument for better coordination of research topics among universities and for promoting collaboration with other research institutions
- Refinance the infrastructure acquired before 2004, based on an inventory survey and partially finance new infrastructures for cooperation between university and non-university research institutes
- Reform the structure of the Austrian Academy of Science by creating a development plan, concluding performance agreements, and introducing modernised financing and liquidity management

NON-UNIVERSITY RESEARCH INSTITUTES

In addition to the university sector, Austria has established a diverse and differentiated landscape of non-university research institutes into which approximately one-third of public expenditure on research and development flows.

Support Measures:

- Reform the structure of individual institutions and further international and strategic positioning of the Austrian Institute of Technology (AIT)

- Finance non-university institutions with temporary performance agreements and subsidy contracts based on criteria such as publications or patents
- Flexibly shape research structures with stimuli for the (re-)integration of non-university institutions into universities or other, larger research structures
- Create non-university research structures primarily in the form of temporary institutions
- Reform and standardise the regulatory framework by redrafting the Research Organisation Act (FOG)

RESEARCH INFRASTRUCTURE

A competitive infrastructure at research institutions, and access to international infrastructures,is an indispensable prerequisite for a competitive research location.

- Develop a binding “national roadmap for research infrastructure”
- Provide stimuli for networking infrastructures to achieve critical mass, such as financing of large infrastructures linked to concepts of co - ordinated usage (such as high-performance computers)
- Expand cooperation of research institutions and firms on the basis of a shared infrastructure
- Austrian participation in European and international infrastructures in the context of the ESFRI roadmap
- Develop a regulatory situation for using infrastructures such as biobanks and statistical data bases

4.2.3 Innovation and Corporate Research

The focus here should expand upon the Austrian economy’s strengths and on the structural improvement of the Austrian manufactur - ing and service sectors in the direction of higher research and knowledge intensity; the expansion of innovation activities at all firms, especially in small- and medium-size enterprises (SMEs); stronger exploitation of the potential of crea tive industries; substantial increases in the level of innovation; and a significant improvement in financing by mobilising private equity and venture capital.

Support Measures

- Expand direct funding and its optimal coordination to include indirect funding for activating and increasing both corporate research and innovative performance among firms
- Stimulate innovation through demand side measures, especially via increased use of innovation-friendly approaches in procurement processes (such as competitive dialogue or functional service description
- Intensify innovation in the public sector (such as energy efficiency in public buildings, egovernance, e-health) and in public infrastructures
- Improve the situation for, and intensify efforts to attract additional research-intensive firms and expand headquarter functions

- Implement an innovation-oriented infrastructure policy, e.g. via innovation-friendly public procurement and high-tech investments in domestic infrastructure, while at the same time supporting technology firm exports[21]

The number of firms that systematically conduct research and development should be increased between 2010 and 2013 by a total of 10% from 2700 and by a total of 25% by 2020.

COOPERATION BETWEEN SCIENCE AND BUSINESS

The Strategy aims to increase the cooperation intensity of Austrian firms and strengthen the strategically oriented collaboration between science and business – with a special focus on excellence and sustainability.

Support Measures

- Further develop support measures for re - search cooperation, networks and strategic alliances with a focus on excellence and sustainability (such as COMET, Bridge, COIN) and models for thematically focussed basic research (such as CDG)
- Strengthen the leverage and transfer functions of clusters and intermediaries
- Identify areas of strength for bundling resources and tapping synergies, and support development in leading topics in research and development (between industry and science/research)
- Support the “linking” of Austrian firms and scientific research institutions to EU and international programmes
- Support firms in securing and enforcing intellectual property and its implementation
- Expand initiatives for strengthening human resources in the area of applied research, and for improving intersectoral and international mobility

START-UPS AND VENTURE CAPITAL FINANCING

In Austria, financing structures are traditionally oriented towards loans, which tends to prevent financing high-risk innovation activities. Specific challenges must be overcome to strengthen equity capital financing of research and development investments.

Support Measures

- Create a regulatory framework to strengthen equity capital in young firms that are oriented towards technology and growth
- Expand venture capital initiatives to stimulate early-phase investment, taking previous developments into account
- Optimise and complete existing support measures for forming technology-based and innovative enterprises, focussing above all on measures for the start-up phase (cf. preseed, seed financing, business angels, technology marketing, etc.)

[21] https://www.bmvit.gv.at/en/service/publications/downloads/austrian_rti_strategy.pdf

- Strengthen finance competence and entrepreneurship at universities, including the establishment of knowledge transfer centres
- Develop new financing models with venture capital investment for realising university intellectual property rights (IPR), and establish university-related venture investment companies

4.2.4 Governance of the research and innovation system - THE FUNDING SYSTEM

Concrete measures include for example reducing programme diversity by concentrating resource allocation on a select few - broadly defined - focal points with strategic relevance; by continuing to streamline and harmonisation of instruments; working out a modern, standardised body of regulations for research funding to serve as the foundation of all federal funding; and by increasing the research premium in accordance with § 108c of the Austrian Income Tax Act from 8% to 10% (while simultaneously disposing tax allowances under § 4 Para 4 of the Austrian Income Tax Act). This should make it possible by 2020 to achieve a distribution of public and private financing in which one-third is public and the other two-thirds are private.[22]

4.2.4.1 Complementarity with Horizon 2020 and international initiatives

The Austrian research program “Production of the Future” is well integrated into the Austrian and European funding landscape.

Within the new European framework program “Horizon2020”[6], the public-private partnership initiative “Factories of the Future” (FoF) will strengthen the technological base of Small & Medium-sized Enterprises (SMEs) through their integration. The pillar called “Industrial Leadership” aims to speed up development of the technologies and innovations that will underpin future businesses and help innovative European SMEs to grow into world-ranked companies. It will provide support for research in Key Enabling Technologies (KETs), e.g., nanotechnology, advanced materials, micro- and nano-electronics, photonics, and biotechnology.

“Access to risk finance” will aim to overcome deficits in the availability of debt and equity financing for R&D and innovation-driven companies and for projects at all stages of development. “Innovation in SMEs” will provide SME-tailored support to stimulate all forms of innovation in SMEs, targeting those with the potential to grow and internationalize across the single market and beyond.
In addition to Horizon 2020, transnational and European research funding instruments are connected to manufacturing. One example is the Joint Undertaking ECSEL (Electronic Components and Systems for European Leadership) with its key application Smart Production; another is the EUREKA umbrella Pro Factory Plus.

[22] https://www.bmvit.gv.at/en/innovation/downloads/austrian_rti__strategy_summary.pdf

Austria has a considerable interest and footprint in all of these initiatives and has shown a strong commitment to these initiatives at the European level: e.g., Austria is a founding member of ECSEL. All these initiatives and programs will further strengthen Austria and Europe's industrial competitiveness. [23]

4.2.5 Financing system

Austria wants to increase research intensity by one percentage point, from 2.76% to 3.76% of GDP, by 2020. Attaining this goal, however, requires that we continue transforming the structure of the corporate sector in the direction of research-intensive industries, while increasing the number of firms that conduct systematic research and development.

Support measures

- Develop research funding regulations, e.g.:
  - Establish basic principles and targets of research policy
  - Define output targets
  - Long-term budgetary planning reliability
  - Code of conduct
- Open up alternative private financing sources

[23] http://ostaustria.org/bridges-magazine/item/8312-production-of-the-future-advanced-manufacturing-in-austria

4.3 Innovative Upper Austria 2020 Support measures

In Upper Austria 5 fields of activities were identified.

According to the national RTI Strategy, in Upper Austria the Fields of Activities are further detailed in Topics and Measures for operational implementation

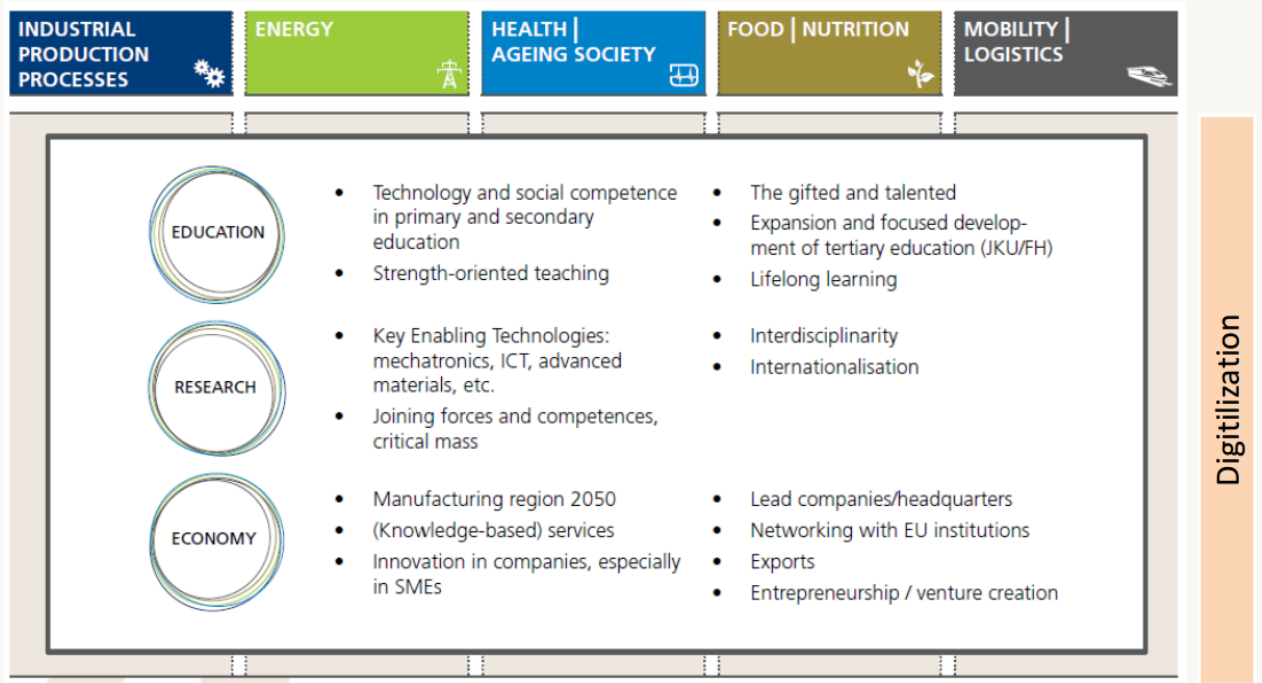

Figure 8: Innovative Upper Austria 2020: Topics and Measures

4.3.1 Research

The central research topics in the "Industrial Production Processes" field of activity are information and communication technologies (ICT), materials and lightweight construction, process and product development.

Support Measures

- Joining forces and competences, critical mass
- Internationalisation of research networks
- Interdisciplinary production research[24]

[24] http://www.ooe2020.at/aktionsfelder/industrielle-produktionsprozesse/

4.3.2 Education

In the Upper Austria of 2020, children and young people will, from a very early age, obtain initial, concrete experiences with key technologies of the future and their everyday application.

Support measures:

- Evaluation, concentration and coordination of past technology awareness initiatives
- Promoting knowledge of industrial manufacturing processes in primary and secondary education
- Expansion and focused development (JKU/FH) through the establishment of new course
- programmes such as product and process engineering, electronics and electrical engineering
- Promotion of women in technological fields
- Development of part-time courses in the field of process technology offered in parallel with employment
- Encouragement of specialist careers

4.3.3 Economy

In 2020, Upper Austria will enjoy attractive conditions for manufacturing companies and will actively support the further development of existing companies and the attraction of new Companies through a range of initiatives.

Support measures:

- Qualitative improvement of the region as a place for industry, as well as marketing of the business region, in particular the central Linz/Wels/Steyr zone
- Increase in innovation competence and the internationalisation of companies, especially SMEs
- Establishment of research and transfer platforms, knowledge databases – open innovation and enhanced absorptive capacity
- Support for leading companies and headquarters, as well as SMEs in specific niches with high growth potential, through specific offers in cooperation with innovation system partners
- Preparation of a regional services strategy and programme in coordination with national programmes and initiatives
- Support for company founders and young entrepreneurs • Further development, joining and alignment of activities in clusters relevant to the objectives in the field of activity
- Recruitment, mentoring, integration and social support of top international personnel [25]

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http://www.ooe2020.at/fileadmin/user_upload/Projektwebsites/ooe2020/Downloads/Programmbuch_english.pdf

5 Supporting schemes and measure of RTI

EU structural funds and investment funds in amount of 536,262,079.00 EUR are available for Austria between 2014-2020 via Ministry of Economic Development and Technology.

The Operational Programme contributes to the achievement of certain elements of the Europe 2020 strategy in Austria. In particular EU funds are used to increase innovation and research and development activities in small and medium-sized enterprises, including technology transfer and investment in certain R&D infrastructure. The programme also supports SMEs in promoting their competitiveness through investments in innovation, energy efficiency and the use of renewable energies. In certain urban areas the programme supports C02 reduction strategies and integrated sustainable development, and in certain other functional urban areas, cooperation and efficient use of resources, including Community Led Local Development in Tyrol as a pilot region. Overall, the programme is to a very high degree (more than 80%) focussed on 3 main areas:

- Research, development and innovation,
- Competitiveness of SME
- Transition towards a low carbon economy

An amount of EUR 3 million will be allocated to Financial Instruments for supporting young innovative technology-oriented enterprises in Upper Austria.

The Programme will focus on four main priorities:

- Increase the number of innovative SMEs
- Improve SMEs' competitiveness
- Increase energy and resource efficiency in SMEs
- Sustainable integrated urban development

Main expected results, by 2023:

- Increase of R&D jobs in enterprises (+5%), and the number of employees in technology centres (+10%)
- Increase of number of innovative (+3%) and 'frontrunner' enterprises (+5-8%)
- Increase of start-ups and new enterprises in technology-oriented and knowledge-intensive sectors (+3% p.a.)
- Increase of number of growing enterprises (+5% p.a.) and employment in production, knowledge-intensive services and tourism
- Increase of energy efficiency (+5% p.a.) and rise of share in use of renewable energies by SMEs (from 9.8% to 12-13%)

Thematic priorities

- TA - Technical Assistance

- TO1 - Research and innovation
- TO3 - SMEs competitiveness
- TO4 - Low-carbon economy
- TO6 - Environment and resource efficiency
- TO8 - Employment and labour market
- TO9 - Social inclusion

Financial information
Total OP budget: 2,065,579,275.00 €

Total EU contribution: 536,262,079.00 €

5.1 Austrian Research Promotion Agency (FFG)

The main measures are mostly financed through Austrian Research Promotion Agency (FFG). It is the national funding agency for industrial research and development in Austria and provides the core funding for national research potential. Offering a diversified and targeted programme portfolio, the FFG gives Austrian businesses and research facilities access to research funding.
The FFG is wholly owned by the Republic of Austria, represented by the Federal Ministry for Transport, Innovation and Technology (bmvit) and the Federal Ministry of Science, Research and Economy (BMWFW). As a provider of funding services, however, the FFG also works for other national and international institutions.
The range of topics relevant to research policy, society and the economy are: Energy, mobility, manufacture, ICT, human potential, space, and security.

Smart manufacturing
In order to create added value and jobs, it is essential that Austrian industry constantly finds new answers to the challenges of a globalised economy. International competition, resource scarcity, environmental standards, energy efficiency, the development of the labour market, flexibility and quality of production processes require that manufacturing research address targeted questions along the entire supply chain.
The focuses comprise:

- High-tech materials and surfaces
- High-capacity, resource-efficient and robust manufacturing processes
- Flexible and versatile production systems
- Innovation, optimisation, miniaturisation and sensor/actuator integration for products
- Bio-based industry/biorefinery
- Substitution and recycling of raw materials

Information and communication technology (ICT):

Information and communication technology is the backbone of our modern knowledge-based society. Its applications are used in all areas of life and the economy, and as a driver of innovation, it can revolutionise methods of industrial manufacture and services.
With five focuses, Austria is one of Europe's leaders in ICT research. In order to secure and expand this advantage, the BMvIT is concentrated on the following core areas:

- Semantic systems
- Embedded systems
- Visual computing, the visualisation of data and applications
- Systems-on-chips
- Trust in IT systems
- ICT and demographic change [26]

In the period 2000 to 2008, the FFG spent over 550 million euro on projects carried out in the field of information and communication technology, which represents a share of around 20 to 25 per cent of all projects (in terms of allocated funding). ICT therefore represents the largest thematic share of FFG funding. The FFG provides a large number of wide-ranging funding programmes in this field.

[26] https://www.bmvit.gv.at/en/innovation/policy/topic_management.html

A summary of actual support schemes, measures and calls including information about implementation body, available budget, eligible costs and other relevant data is presented in Table 6.

Table 6: National support schemes summary

Country	Measure/Call	Objective	Implementation body	Budget (Mio €)	Beneficiary	Financing rate	Eligible costs	Max. grant (€)	Year from:	Year to:
AT	Production of the Future	AIM 1: efficient usage of resources and raw materials as well as efficient production technology AIM 2: flexible Production AIM 3: Production of high-quality Products Focus on : Industry 4.0, Robotics and Nanotechnology	Austrian Research Promotion Agency (FFG)	19 Mio €	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations,	max 85 %	staff costs, overheads, costs of instruments, equipment and external experts	max. 2 million euros	2017	2017
AT	Production of the Future	AIM 1: efficient usage of resources and raw materials as well as efficient production technology AIM 2: flexible Production AIM 3: Production of high-quality Products Focus on : Monitoring and controlling of production plants, integrated product and process development, functional surfaces	Austrian Research Promotion Agency (FFG)	The RTI Initiative Production of the Future will make available a total amount of EUR 24.5 million for a range of funding measures in 2016.	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations,	max 85 %	staff costs, overheads, costs of instruments, equipment and external experts	max. 2 million euros	2016	2016

AT	Production of the Future	The economic performance of Austria strongly depends on its manufacturing industry. The ability to manufacture internationally competitive products and to increase productivity is key to the economic growth of Austria as a highly industrialised and knowledge based country. And innovations in the manufacturing sector will continue to be an indispensable basis for added value and employment in the future.	Austrian Research Promotion Agency (FFG)	450	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations, Regional administrative bodies of upper austria	max 85 %	staff costs, overheads, costs of instruments, equipment and external experts	max. 2 million euros	2011	2015
AT	ICT of the Future	ICT of the Future is) for the promotion of challenging technology development and innovation in information and communication technology, interlinked with application fields and societal challenges.The programme supports ICT innovation in a comprehensive perspective.	Austrian Research Promotion Agency (FFG)		SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations, Regional administrative bodies	max 85 %	staff costs, overheads, costs of instruments, equipment and external experts	max. 2 million euros	2016	2017
AT	Basisprogramm	Development of innovative Project of Companies, with the aim to exploit products and services; open to all technology fields	Austrian Research Promotion Agency (FFG)	€ 100 Mio. / Year	SME, Large enterprises, Start-up,	Funding is up to 70 %		max. € 3 Mio.	2017	2017

AT	Innovatives Oberösterreich 2020 Ausschreibung „Digitalisierung“	Im Ausschreibungsschwerpunkt „Bestehendem Zukunft geben“ geht es darum, bestehende Anlagen, Infrastruktur, etc. für die Zukunft fit zu machen. Im Schwerpunkt „Datennutzung in Netzwerken“ sollen Daten von bzw. für Netzwerke wertschöpfend zur Verfügung gestellt bzw. genutzt werden.	Innovative Upper Austria 2020	6 Mio	Research institution and companies in Upper Austria	mx 85 %	staff costs, overheads, costs of instruments, equipment and external experts	800.000 €	2017	2017
AT	„Produktionsstandort OÖ 2050: Industrie 4.0“	Industry 4.0, digital factory, automatisation of light weight Development of high-tech,adaptive and high quality production – in the field of industrial production processes and mobility/logistics.	Innovative Upper Austria 2020	3 Mio	Research institution and companies, Non-profit organisations in Upper Austria	max. 80%		max. 800.000	2014	2015
AT	COIN – Cooperation & Innovation	COIN contributes towards fostering Austria’s innovation performance by the better and broader transposition of knowledge into innovation.	Federal Ministry of Science, Research and Economy (BMWFW)	NetworK: 4,0 Mio € Capacity building: 9, 3 Mio €	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations,	Networks: Max. 60 % Capacity building: 70 %	staff costs, overheads, costs of instruments, equipment and external experts	Networks: Max. 500.000 EUR Capacity building: Max 2. Mio €	2016	2017

AT	Research Studios Austria	The Research Studios Austria (RSA) programme promotes the application and implementation of results from pre-industrial research, thus strengthening collaboration between Austrian science and industry.	Federal Ministry of Science, Research and Economy (BMWFW)	EUR 10,35 Mio.	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up,	max. 70%	staff costs, overheads, costs of instruments, equipment and external experts	max. EUR 1,3 Mio.	2016	2017
AT	Take Off	The Austrian Aeronautics Programme TAKE OFF is designed to maintain the competitiveness of the Austrian aeronautical industry and its suppliers by generating specific expertise and networking the relevant industrial, university and non-university actors. The programme supports the establishment of strategic partnerships at national, European and international level and the development of new markets.	Federal Ministry of Transport, Innovation and Technology (BMVIT)	7,7 Mio €	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations,	max. 85%	staff costs, overheads, costs of instruments, equipment and external experts	max. 2 Mio	2016	2017
AT	BRIDGE Programme	Basic research to enhance Co-operation science - industry and exploitation of results	Austrian Research Promotion Agency (FFG)	4,0 Mio €	SME, Large enterprises, Universities, Universities of applied sciences, Competence centres, Research facilities, Start-up, Non-profit organisations,	max 75 %	staff costs, overheads, costs of instruments, equipment and external experts	no upper limit	2017	2017

AT	R&D Infrastructure Funding	Funding of strengthen and purchasing R&D Infrastructure for basic and applied research, up to all topics	Austrian Research Promotion Agency (FFG)	11,7 Mio. EUR	SME, Large enterprises, Universities, Universities of applied sciences, Research facilities	Up to. 85%	Cost of R & D infrastructure (in the start phase also staff costs, overheads, costs of instruments, equipment and external experts)	Max. 2 Mio. EUR	2016	2016

6 Smart Factory related projects

This chapter presents relevant national projects in execution by the partner or partnering organisations. Due to quantity of information in this chapter only an extract table is presented below and more data is included in separate XLS file – sheet "Projects".

Table 7: Smart Factory related projects – extract

Main applicant country	Project name	Programme name
AT	KNOW-Center	COMET
AT	VRVis K1 Centre for Visual Computing	COMET
AT	CDP - Austrian Center for Digital Production	COMET
AT	Pro2Future	COMET
AT	ShowMe - Integrierter Montageassistent in der Motorenproduktion	FFG 834254
AT	InstructMe – Semiautomatische Erzeugung von Verfahrensanweisungen in der Montage über Bilddaten	FFG 843693
AT	AssistMe – Humanzentrierte Assistenzrobotik in der Produktion	FFG 848653
AT	RePlan - Reaktive Pfadplanung für Prüfprozesse im Leichtbau	FFG 849421
AT	MMAssist II -	FFG poduction of the futue
AT	NexGen – Human-Robot cooperation to enable a next generation robotic workplace	FFG 840214
AT	SIAM: Seamless Interoperability of Assistive Modules in the Digital Factory	FFG 849971
AT	Komoprod - Kooperationsmodelle für Mensch-Maschine-Interaktion im Produktionsprozess	BMVIT
AT	FlexRob – Flexibler, robotischer Assistant für die individualisierte Produktion	FFG 855425
AT	Christian Doppler Labor „Contextual Interfaces"	CDL
AT	LiTech – Easy to use Professional Business and System Control Applications	FFG 843535
AT	Assist 4.0 – Kontextbasierte, mobile Assistenzsysteme für die Industrie 4.0	FFG 843630

7 List of regional actors

This chapter presents Smart Factory relevant actors. A Selection of production oriented SMEs and large enterprises as potential users of solutions are presented in Table 8.

Table 8: List of regional actors – users

Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
Bitter GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Sierning	http://www.bitter.at/
IH TECH GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Behamberg	http://www.ihtech.at/
DS Automotion GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Linz	http://www.ds-automotion.com/
BRP-Rotax GmbH & Co KG	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Gunskirchen	http://www.brp.com/
PSI Metals Austria GmbH	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Graz	http://www.psimetals.de/de/met-home/

Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
Kappa Filter	SME	Mechanical engineering	Manufacturing	Engineering	Steyr-Gleink	http://www.kappa.at/
NKE Austria GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Steyr-Gleink	http://www.nke.at/de/
INOCON Technologie Gesellschaft m.b.H.	SME	Mechanical engineering	Manufacturing	Engineering	Attnang-Puchheim	https://www.inocon.at/
AVL List GmbH	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Graz	https://www.avl.com/
BECOM Electronics GmbH	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Hochstraß	http://www.becom.at/de/
Geberit Produktions GmbH & Co KG	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	St. Pölten	http://www.geberit.at/de_at/index.html
Schmachtl GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Linz	http://www.schmachtl.at/

A Selection of potential solution providers for Smart Factories are presented in Table 9.

Table 9: List of regional actors - solution providers*

Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
AVL List GmbH	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Graz	https://www.avl.com/
AREC Automatisierungstechnik GmbH	SME	Mechanical engineering	Manufacturing	Engineering	ST.GEORGEN AM YBBSFELDE	http://www.arec.at/de/
BEKO Engineering & Informatik AG	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Linz, Donau	http://www.beko.at/home/
framag Industrieanlagenbau GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Frankenburg	http://www.framag.com
HAGE Sondermaschinenbau GmbH&Co KG	SME	Mechanical engineering	Manufacturing	Engineering	Obdach	http://www.hage.at/
Haratech GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Linz	http://www.haratech.at/
Kapsch BusinessCom AG	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Vienna	https://www.kapsch.net/
Promot Automation Gmbh	SME	Mechanical engineering	Manufacturing	Engineering	Roitham	http://www.promot.at/
Tablet Solutions GmbH	SME	Digital economy	Manufacturing	Engineering	Vienna	https://www.tabletsolutions.at/
Tieto Austria GmbH	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Vienna	https://www.tieto.at/
XiTrust Secure Technologies GmbH	SME	Digital economy	Manufacturing	Engineering	Graz	https://www.xitrust.com/
RIC (Regionales Innovations Centrum) GmbH	SME	OTHER	Manufacturing	Engineering	Gunskirchen	https://www.ric.at/
Risc Software	R&D center	Digital economy	Services		Hagenberg	http://www.risc-software.at/de/
AIT Austrian Institute of Technology GmbH	R&D center	OTHER	Services		Vienna	https://www.ait.ac.at/
evolaris next level GmbH	R&D center	OTHER	Services		Graz	https://www.evolaris.net/de/
Fraunhofer Austria Research ...	R&D center	OTHER	Services		Vienna	http://www.fraunhofer.at/
JOANNEUM RESEARCH Forschungsgesellsc...	R&D center	OTHER	Services		GRAZ	https://www.joanneum.at/
Kompetenzzentrum - Das virtuelle Fahrzeuge	R&D center	OTHER	Services		GRAZ	http://www.v2c2.at/
LCM	R&D center	OTHER	Services		LINZ	http://www.lcm.at/en/
SCCH	R&D center	OTHER	Services		Hagenberg	https://www.scch.at
PROFACTOR GmbH	R&D center	OTHER	Sevices		Steyr-Gleink	www.profactor.at

*A solution provider is a vendor, a service provider or a value-added reseller (VAR) that comprehensively handles the project needs of their client from concept to installation through support. This process normally involves studying the client's current infrastructure, evaluating the client's needs, specifying the mix of manufacturers' hardware and software required to meet project goals, installing the hardware and software at the client's site(s). In many cases, the "solution" also includes ongoing service and support from the VAR.

A number of companies presented in **Table 10** is acting as potential user and also solution provider for Smart Factories.

Table 10: List of regional actors - Users/solution providers

Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
plasmo Industrietechnik GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Vienna	http://www.plasmo.eu/
ABF-Industrielle Automation GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Linz	http://www.abf.at/
DS Automotion GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Linz	http://www.ds-automotion.com/
Fill Gesellschaft m.b.H.	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Gurten	http://www.fill.co.at/
GTech Automatisierungstechnik GmbH	SME	Mechanical engineering	Manufacturing	Engineering	Ried im Traunkreis	http://www.gtech.at/
KEBA AG	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Linz	http://www.keba.com
KNAPP AG	Large Enterprise	Mechanical engineering	Manufacturing	Engineering	Hart bei Graz	https://www.knapp.com/