

Interreg



EUROPEAN UNION

Austria-Czech Republic

European Regional Development Fund

External impulses supporting innovation in the Upper Austrian region

MA Fratričová A.

September 2018

Table of Contents

TABLE OF CONTENTS	2
TABLE OF FIGURES	3
1. INTRODUCTION	4
2. AGENCIES, TECHNOLOGY CENTRES AND INCUBATORS	4
2.1 Austrian Research Promotion Agency (FFG)	5
2.2 FWF Austrian Science Fund	6
2.3 Business Upper Austria (Biz-Up)	7
2.4 Heuristic	7
2.5 Upper Austrian Research GmbH	8
2.6 Center for innovation systems and policy	9
2.7 tech2b- der Inkubator	9
2.8 Technologie- und Innovation Center Steyr	9
3. FUNDING OPPORTUNITIES AND GRANTS	10
4. COOPERATION WITH UNIVERSITIES	21
5. PROGRAMMES SUPPORTING INNOVATION	22
5.1 Regional programmes	22
5.1.1 Upper Austria 2000+	22
5.1.2 Innovative Upper Austria 2010	23
5.1.3 Innovative Upper Austria 2010plus	23
5.1.4 Innovative Upper Austria 2020	23
5.2 National programmes	24
5.2.1 Strategy for research, technology and innovation of the Austrian Federal Government.....	24
5.3 International programmes	26
5.3.1 Horizon 2020.....	26
5.3.2 Europe region Danube-Vltava	26
5.3.3 Danube region innovation strategy	27
6. CONCLUSION	27
7. REFERENCES	28

Table of Figures

Figure 1: The structure of FFG (FFG 2017c).....	5
---	---

1. Introduction

The aim of this report is to analyse the external impulses supporting innovation within the Upper Austrian region.

Innovation in Austria is based on several pillars:

- an effective networking between businesses and science centres within clusters and competence networks
- tax incentives for companies active in research and development
- funding and financing schemes for basic and applied research
- high-quality university education supporting development and research in the region
- working and living conditions attracting qualified workforce (FFG 2018t)

This report focuses on two of these pillars; the innovation network environment and funding. The main aim of the paper is to describe the network of technology centres, incubators, and agencies supporting innovating activities in the local companies. Moreover, the funding possibilities for SMEs are listed and their primary focus and industries are specified, as well as possibilities of cooperation with the local universities are discussed. The last part of the report aims to describe the past and present programmes supporting innovation on a regional, national, and international levels.

2. Agencies, technology centres and incubators

The business landscape in Austria is characterized by innovative small and medium sized enterprises and increasing direct investment for research and development, as innovation and research are crucial aspects necessary to secure Austria's leading economic position on the international market in the future. (Innovation Austria 2017) To ensure methodical innovation approach and support for companies, several agencies, technology centres, and incubators were established, supporting the economic development and providing infrastructure and services for an innovation-friendly environment.

2.1. Austrian Research Promotion Agency (FFG)

The Austrian Research Promotion Agency (FFG) is a national funding agency for industrial research and development providing easy access to companies and research facilities. The agency was established in 2004 and is wholly owned by the Republic of Austria, with representation by the Federal Ministry for Transport, Innovation and Technology (bmvit) and the Federal Ministry for Digital and Economic Affairs (BMDW). The agency cooperates with numerous national and international institutions, and “annually it awards well over 400 million euros in federal funding to around 3,000 applied research and innovation projects involving around 5,500 partners.” (FFG 2017a) Around 80% of the project funded by FFG would not have been completed without its financial support. “On average every funding euro generates ten times its value in additional revenue for business. Start-ups supported by FFG funding enjoy above-average performance.” (FFG 2017d)

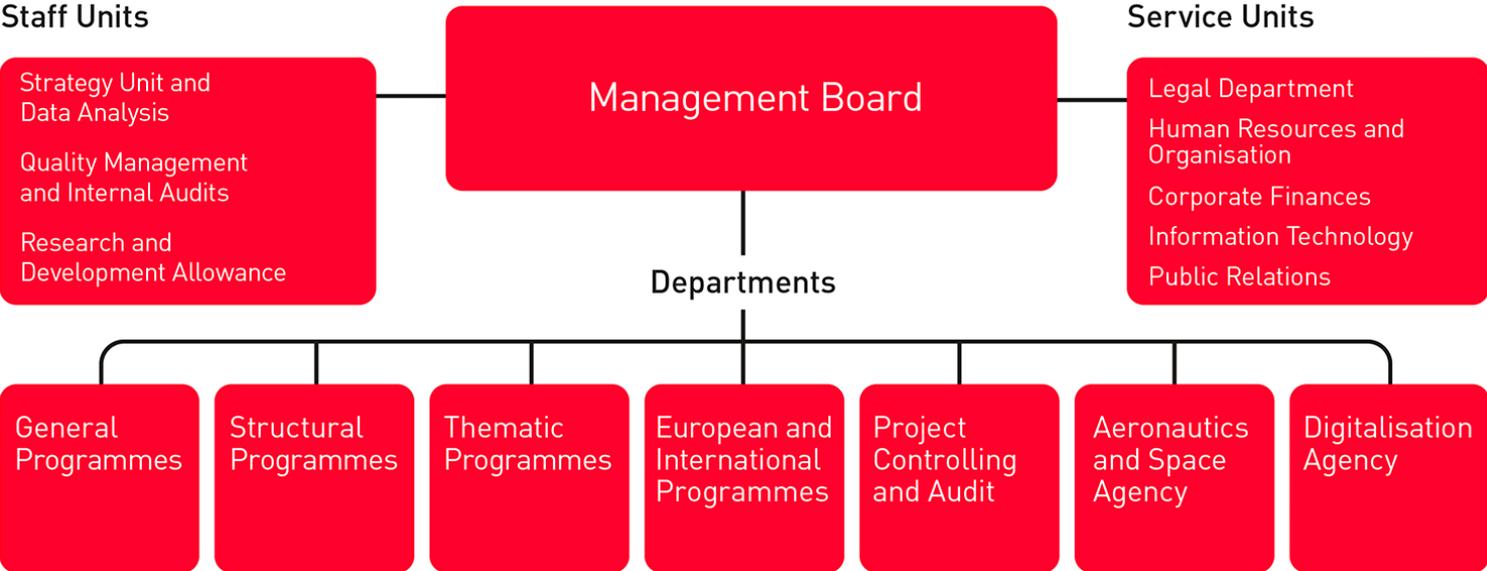


Figure 1: The structure of FFG (FFG 2017c)

The General Programmes provide a wide range of funding for research and development and offer tailor-made support for projects throughout their whole lifecycle. More about the specific innovation funding possibilities will be discussed in the upcoming report chapter.

The primary goal of the Structural Programmes is to optimize structure and infrastructure in research and innovation. Through this optimization, FFG aims to ensure efficient and effective cooperation among all the innovation partners.

“Structural bottlenecks and weak points are overcome, and proven structures constantly adapted to meet new challenges. New forms of partnership are developed, particularly between scientific institutions and business, new knowledge is generated, and new fields of expertise are established.” (FFG 2017e) The Thematic Programmes focus on promotion of innovation and development in specific areas, which are crucial for the Austrian economy and development. By promoting the strategic innovation fields, FFG supports innovation activities of local businesses in these areas. “A joint portfolio of research topics strengthens long term cooperation between science and business, encourages synergies between the research areas and is targeted at achieving international visibility.” (FFG 2017f)

The primary focus of the European and International Programmes department is to participate in larger international innovation initiatives and programmes. “FFG's European and International Programmes provide regular information about European programmes and initiatives to over 30,000 researchers, companies and institutions in Austria. [FFG's] experts hold an average of 6,500 advisory sessions on European RTI programmes every year.” (FFG 2017b) FFG also acts as a national contact point for Horizon 2020.

2.2.FWF Austrian Science Fund

The FWF is the central funding organization in Austria, supporting basic and science research activities. The primary objective of FWF is to improve Austria's international performance in research and science and to increase the attractiveness of Austria as a destination for high-level research teams and scientists to enhance Austria's innovation potential and performance. Moreover, the organization aims to increase the quality and quantity of Austria's scientific human resources and personnel in research. Furthermore, FWF focuses on highlighting “the interactive effects of science and research with all other areas of culture, the economy and society, and in particular to increase the acceptance of science and research through concerted public relations activities.” (FWF 2017a)

FWF is also active in numerous international initiatives, such as Science Europe, which is the “umbrella organization of the European Research Funding and Research Performing Organisations” founded in 2011, or in ERC (European Research Council), COST (Coopération européenne dans le domaine de la recherche scientifique et technique) or EUREKA. (FWF 2017b)

2.3. Business Upper Austria (Biz-Up)

Business Upper Austria is the business agency of the Upper Austrian government, which focuses on location development, public funding advisory services, and company settlement. The agency helps local as well as foreign companies and offers tailor-made services throughout the whole process. To the responsibilities of the Business Upper Austria belongs “securing, strengthening and enhancing the business and employment location of Upper Austria, positioning Upper Austria internationally, creation and continued development of infrastructure to encourage investments, innovation and technologies, promoting the settlement of companies as well as expansion of existing companies, and promotion of innovation and technology transfer.” (Business Upper Austria 2017c)

Business Upper Austria also provides services and consulting on obtaining funding in the regional, national, or international (European) funding programmes, as well as information about cooperation projects and technology transfer. (Business Upper Austria 2017a) Furthermore, the agency focuses on intellectual property rights (IPR) and offers advice on IPR contracts, technology assessment, and patent searches. Companies can also get assistance in preparation for registration processes and obtain general information about trademarks, patents, and registered designs. (Business Upper Austria 2017b) Innovation projects of SMEs are also supported by tailor-made innovation instruments, such as tool-assisted optimization of innovation management (European Improve-Tool), workshops to promote funding strategies, or innovation consultation and trainings. (Business Upper Austria 2017d) Biz-up’s subsidiary tech2b offers support and services to technology-oriented start-ups. Currently approximately 30 companies cooperate with this incubator, which provides “360° service for start-ups: coaching, mentoring, further education, infrastructure and financial funding”. (Business Upper Austria)

2.4. Heuristic

Heuristic is an open innovation agency focusing on crowdsourced research and development innovation. The main specialization of the organization is “crowdsourcing vendors management, innovation brokerage and toolkits for mass innovation.” (Heuristic 2017) Heuristic is based in Vienna but operates internationally. It offers services such as crowdsourcing vendors analysis, exploring their know-how, “community characteristics, business models,

capacities, procedures, standards, prices, execution time, risk". (Heuristic 2017) Furthermore, they find suitable vendors or mixture of vendors for their clients, therefore optimizing "clients' budget, minimize time of execution and risk, and maximize effects of investment in crowdsourced R&D Innovation. [They] can also advocate and manage projects, starting with preparation of task, monitoring and facilitating execution." (Heuristic 2017) The agency also offers innovation brokerage and find suitable markets for their clients' innovations. Moreover, they suggest adaptations, commercialisation models, "sale of patents, out-licensing, spin offs etc.". (Heuristic 2017)

Heuristic provides toolkits for mass innovation, helping companies to utilize the full potential of co-creation with "customers, employees, affiliates and partners. Such toolkits are used for idea generation and collection, prototyping, mass customisation, and affiliated product development among other areas". (Heuristic 2017)

2.5. Upper Austrian Research GmbH

Upper Austrian Research GmbH is the leading organization promoting innovative solutions in the region. It focuses mainly on non-university, and research in technology and innovation policy. (Upper Austrian Research GmbH 2017b) The organization is an expert in medical technologies ("diagnostics, prevention and therapy, data and sensor technology and special software for medical application") and production research (smart materials, information and communications technology, mechatronics). (Upper Austrian Research GmbH 2017a) UAR provides connection between research and industry, to ensure generation of innovative products and services. "The research centres provide top scientists and state-of-the-art infrastructure as well as support with project management and implementing research findings. In close cooperation with the research departments and laboratories in the industrial sector, research findings are incorporated in specific, marketable product developments in joint projects." (UAR 2018c)

The innovativeness and competitiveness of local companies is ensured by applied research, knowledge transfer, cooperation of interdisciplinary teams, and market-based infrastructure. (UAR 2018a) The UAR has also close cooperation network with "the Johannes Kepler University Linz, the University of Applied Sciences Upper Austria and other non-university research institutes such as LKR

Leichtmetallkompetenzzentrum Ranshofen GmbH, ASIC Austria Solar Innovation Center and Life Tool gemeinnützige GmbH". (UAR 2018b) Moreover, the organization offers international network services and helps the clients to access information about the Upper Austrian region, its competences, possible cooperation partners, research institutes, and contacts to local experts. (UAR 2018b)

2.6. Center for innovation systems and policy

The Center for innovation systems and policy is a think-tank offering consultancy to companies, universities, research institutes, and Austrian and European administrations. The main areas of expertise are "Innovation systems and digitalization", "innovation dynamics and modelling", "active and assisted living", "smart grids", "smart cities and regions", "institutional change and policy", and "societal future". (AIT 2018a) The organization "designs indicator-based systems for funding, controlling and reporting R&D and innovation." (AIT 2018c) The center provides help to companies in their innovation strategy development and offers "wide range of data infrastructures (e.g. patent databases, simulation tools), are integrated into international networks and can use the findings of international research projects for specific question". (AIT 2018b)

2.7. tech2b- der Inkubator

Tech2b is an incubator established in 2002, helping over 50 start-ups every year. It supports companies in the spheres of funding, grants, provides contacts between start-ups and established companies, helps start-ups with their idea realization. (tech2b 2018d) The tech2b team consults start-ups, supports their individuals requirements, helps with business plan and business model workshops, and assists in document and application preparations. (tech2b 2018c) With the AplusB program, the incubator accelerates the development of innovative technology and knowledge-intensive projects. (tech2b 2018b) The "B2E-Business2excellence" services provide support in market launch, series transition, sales, financing, and internationalization. The companies have access to networks, external expertise, and consulting in their business growth stages. (tech2b 2018a)

2.8. Technologie- und Innovation Center Steyr

The technology and innovation center Steyr (TIC Steyr) offers services to companies in the spheres of consulting, office services, and events. The

organization consults companies in business areas and provides contacts to local experts according to the needs of the specific company. It provides spaces, rooms, and halls for special company events, and manages calls and post services in case it is needed. Moreover, TIC supports companies in the questions of location selection, grants and promotions application and selection, and monitoring of approval procedures. (TIC-Steyr 2018)

Moreover, the Upper Austrian region provides several other options for companies seeking help in consultancy, work spaces renting, start-up services, funding and grants information, and other spheres, such as:

- Techcenter Linz-Winterhafen
- Technologiezentrum Bad Ischl
- Technologiezentrum Mondseeland
- Technologie- und Innovationszentrum Kirchdorf
- Technologie- und Dienstleistungszentrum Ennstal
- Softwarepark Hagenberg
- Logistikzentrum Ennschafen
- Technologiezentrum Perg
- Technologiezentrum Freistadt
- Technologie- und Dienstleistungszentrum Donau Böhmerwald
- Techno-Z Ried
- Techno-Z Braunau

3. Funding opportunities and grants

There is a large variety of programmes funded by FFG open for different target groups (SMEs, start-ups, large companies, universities, UAS, NGOs, research facilities) in numerous industries, supporting innovation, research and development.

Name of the Programme	Target group	Topics	Information
AAL Active and assisted living	SMEs Large companies Universities Start-ups	Information technologies	AAL programme focuses on research and development in the context of innovative products, systems and

	Research institutions		services in information and communication technologies that benefit older people and improve their quality of life. (FFG 2018a)
AplusB Academia plus Business	Start-ups Single researchers	Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Space	The funding is for AplusB centers providing help to start-ups and individuals who want to transform a business idea into existing business. The goal of the programme is to offer “counselling and assistance during the actual start-up phase and but also establishing the idea of entrepreneurship more firmly in academic theory and practice.” (FFG 2018b)
AT:net Austrian electronic Network	SMEs Large companies Start-ups Universities UAS NGOs Research Institutes	Information technologies	A program of the Federal Ministry of Austria Digital and Economic Affairs promotes market launch and establishment of digital applications and digital products. It offers support to start-ups and established companies on their way to digitalization in B2B, B2C and B2A. (FFG 2018c)
ASAP Austrian Space	Not specified	Space	The programme supports space technologies market in Austria by

<p>Applications Programme</p>			<p>offering funding, advice, and networking possibilities. "The Austrian Space Applications Programme addresses Austrian and international scientists, scientific institutions, industrial enterprises and other companies, including SMEs located in Austria... The programme should enable bilateral cooperation, support scientific participation in ESA and bilateral projects and complement development in the application domain." (FFG 2018d)</p>
<p>Benefit-Intelligent Technologies for older people</p>	<p>Companies NGOs Research Institutions</p>	<p>Information technology</p>	<p>The goal of the programme is to promote the development and research of ICT products and services to increase the quality of life of older people. "Funding is provided for innovative, application-oriented projects in cooperation between business enterprises and research institutions or social service providers, with substantial involvement of end users." (FFG 2018e)</p>

Beyond Europe	SMEs Large companies NGOs Competence centres UAS Universities	Service Innovations, Society, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	The Beyond Europe programme aims to increase and strengthen international collaborations of Austrian companies, research institutes and universities with partners outside of Europe. (FFG 2018f)
Bridge	SMEs Start-ups Large companies UAS Universities	Service Innovations, Society, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	The Bridge programme supports basic research with realistic potential to be commercially introduced on the market. The programme offers up to 80% funding level to small companies and 70% to medium-sized companies. (FFG 2018g)
CEDR Transnational Road Research	SMEs Large companies Universities UAS	Mobility	The aim of the CEDR programme is to promote cooperation between the various European road

Programme			administrations in the field of road research activities. (FFG 2018h)
City of tomorrow	SMEs Start-ups Universities Large companies UAS	Environment Energy	The aim of the programme is to develop new technologies, technology systems, and urban services. The goal is to support urban modernization and to combine highest resource efficiency with a high degree of attractiveness for companies and citizens. (FFG 2018w)
COIN Cooperation And Innovation	SMEs Large companies Universities UAS Start-ups	Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	“COIN contributes towards fostering Austria’s innovation performance by the better and broader transposition of knowledge into innovation...[It] encourages technology transfer within entrepreneurial cooperation schemes, thus raising the level of innovation within businesses and strengthening their cooperation capacities.” (FFG 2018i)
COMET- Competence Centers For Excellent Technologies	SMEs Large companies UAS Universities	Service Innovations, Society, Information technology,	The national program was launched in 2006 and provides best-cases models and technology policy initiatives in Austria.

	Research institutes	Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	It “develops new expertise and encourages greater internationalisation as a sign of excellent cooperative research. Bundling these competences within a single centre and defining promising/emerging fields of research via science - industry collaboration shall stimulate new research ideas, encourage technology transfer, and strengthen the innovative capacity of companies.” (FFG 2018j)
ECSEL- Electronic components and systems for European Leadership	SMEs Universities Large companies UAS NGOs	Information technology	The ECSEL provides support in the spheres of “sophisticated innovation and technology development in information and communications technology, in the fields of micro and nanoelectronics, as well as embedded/cyber-physical and intelligent integrated components and systems.” (FFG 2018k)
Energy research programme	SMEs Start-ups Large companies Universities UAS	Environment Energy	The program aims to provide safe, sustainable and affordable energy. It covers the entire energy chain from energy

	Research facilities		conversion to transport and use of energy. (FFG 2018l)
ERA-NET	SMEs Start-ups Large companies Research entities Universities UAS	Service Innovations, Society, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	The programme supports coordination of national and international funding programmes. "National or regional authorities select research funding programmes they wish to coordinate with other countries or make accessible to transnational research projects. Many ERA-NET initiatives offer joint calls for the submission of transnational research projects." (FFG 2018m)
EUREKA	Not specified	Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	The programme supports "collaboration between organisations across Europe in the near-market development of new and innovative advanced technology products, processes and services. With this strong market orientation, EUREKA complements the EU's programmes of strategic research." (FFG 2018n)
GIN-Global Incubator Network	Start-ups	Service Innovations, Society, Information	The Global Incubator Network provides a point of contact and network for start-ups, investors,

		technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	and incubators in innovation and finance fields. "The Global Incubator Network supports start-ups to expand their business internationally. GIN connects start-ups that want to internationalize with experts and investors." (FFG 2018o)
Innovation voucher	Start-ups SMEs Universities UAS	Service Innovations, Society, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	"The Innovation Voucher enables enterprises to enlist the services of research institutions and to pay for these services to a maximum value of € 10,000. The Innovation Voucher is designed to encourage SME to cooperate with research institutes. It should make it easier for small and medium-sized companies to overcome inhibition thresholds regarding cooperation with research institutions." (FFG 2018p)
Patent.Voucher	SMEs Start-ups	Service Innovations, Society, Information technology, Human resources, Life sciences,	"The Patent.Voucher supports small and medium-sized enterprises (SMEs) as well as start-ups and founders to check the patentability of their innovation idea and furthermore to speed up

		Materials and production, Mobility, Security, Environment and energy, Further issues, Space	preparation and submission of the application for a patent. The FFG aid covers up to 80% of the total costs, which are limited by € 12.500." (FFG 2018q)
Production of the future	SMEs Large companies Start-ups NGOs Universities UAS Research facilities	Materials and Production	The core of the Austrian economy is highly competitive manufacturing industry. Therefore, this programme supports research and development in manufacturing industry and aims to help Austrian companies in their efforts to develop new markets and business fields. (FFG 2018r)
R&D competences for industry	SMEs Start-ups Large companies Universities UAS NGOs	Service Innovations, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	The main focus of the programme is SMEs. The initiative has 3 lines of activities: qualification increase seminars enabling access to new technologies, expertise development seminars: mid-term customized trainings to increase innovation skills in relevant technologies, and expertise enhancement in applied research: long-term trainings between

			companies and universities in industry-driven topics at a high scientific level. (FFG 2018s)
Service innovations initiatives	SMEs Large companies Start-ups Universities UAS Research facilities	Service Innovations, Society, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy, Further issues, Space	The goal of the Service innovations initiatives programme is to increase “awareness for R&D in service industry and for services as added value for the traditional industries” and to “strengthen the competitiveness of companies based in Austria by funding the development of hybrid products, processes and services...The funding level is max. 50 % of total eligible projects costs (start-ups up to max. 70 %).” (FFG 2018u)
SME Package	SMEs Start-ups Universities UAS Research centers	Service Innovations, Society, Information technology, Human resources, Life sciences, Materials and production, Mobility, Security, Environment and energy,	As SMEs are the key players in the Austrian economy, the programme supports these companies on their way to structured research and development activities. The aim is to support SMEs in their service innovation activities by offering a large variety of funding options for service innovation. (FFG 2018v)

		Further issues, Space	
TAKE OFF	SMEs Start-ups Universities Large companies UAS NGOs	Information technology, Materials and production, Mobility	The TAKE OFF- Technology between sky and Earth programme aims to increase and strengthen Austria's "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." (FFG 2018x)
aws IP.Market	SMEs Research facilities	Not specified- Commercial exploitation or market transfer of innovations or new technologies outside the company or research institution	Consulting, support and financing, with the aim of supporting the exploitation of innovative technologies and patents. aws IP.Market provides potential analysis of innovation degree and maturity, project-specific marketing support and SMEs can get grants: for the acquisition of property rights, for the implementation of marketing activities, for legal advice in connection with license

			and patent purchase contracts. Financing for SMEs is up to 80% of the eligible costs, grant up to € 200,000. (aws 2018b)
Aws IP.Coaching	SMEs	Technology	SMEs from the technology sector are working with aws to develop a strategy for the use of patents and other intellectual property rights. The aws provides support through advice and grants of up to EUR 100,000.00 (for example, for patent application costs). (aws 2018a)

4. Cooperation with universities

There are several federal and private universities, as well as a university of applied sciences in the Upper Austrian region. The University of Applied Sciences Upper Austria has campuses in Steyr, Linz, Hagenberg and Wels, and offers bachelor's and master's studies in the spheres of engineering, media and communication, environment and energy, informatics, economics and engineering, social sciences, life sciences, and economics and management. It is the most research-oriented university of applied sciences in Austria, with more than 440 researchers working on almost 350 ongoing projects. The projects are within 17 thematic areas, such as automated control engineering and simulation, digital business, food technology and nutrition, global business management, innovation and technology management, information and communication systems, materials and production engineering, logistics, medical technology, software technology and application, media and knowledge technologies, or production and operation management. (University of Applied Sciences Upper Austria 2018a) € 15 million is made available each year as research funding for the national and international projects, and the UAS cooperates with 630 partners from business and society.

(University of Applied Sciences Upper Austria 2018b) Johannes Kepler University in Linz, with its 19,000 students, offers over sixty programmes in the spheres of social sciences, economics, and business, law, engineering and natural sciences, and medical studies. The JKU has been cooperating with research centres and networks (business, scientific, and local community). The university has several Christian Doppler Laboratories (such as microscopic and spectroscopic material characterization, client centred cloud computing, monitoring and evolution of very large software systems, etc.). The university also focuses on pre-competitive areas and acquired centres and projects within the COMET programs. (JKU 2017a, 2017b, 2017c) Another university in Upper Austria is the University of Art and Design Linz. It offers bachelor's and master's studies in the spheres of art and technical studies, cultural studies, and specialized programmes for teachers. The focus of the university is to combine art, practical creative work, and applied scientific research. The private universities of Upper Austria are Anton Bruckner Private University, specializing in music, drama, and dance, and the Catholic Private University Linz. (University of Art and Design Linz 2017)

5. Programmes supporting innovation

This chapter provides a description of past and present programmes supporting innovation in the Upper Austrian region on regional, national, and international levels.

5.1. Regional programmes

On the regional level, the paper describes the Upper Austria 2000+, Innovative Upper Austria 2010, Innovative Upper Austria 2010plus, and Innovative Upper Austria 2020 programmes.

5.1.1 Upper Austria 2000+

The programme was launched in 1998 as a response to the crisis in state-owned industries in the 1980s and lasted until 2003. Financed by regional and federal funding, as well as the EU Structural Funds, the amount of € 300 million was given to support research and development activities. (Janssen, den Hertog, and Kuusisto 2014) The project started with a large-scale study about the Upper Austrian region, and a foundation of Technology and Marketing Company (TMG). Within the programme, 12 strategies with 33 measures were developed in technology, location marketing, and professional qualification fields. (Land Oberösterreich 2014) 11 clusters were founded; an initiative that later resulted in

the foundation of the “Clusterland” agency in 2005. Approximately twenty technology and innovation incubators were launched and maintained within the program. The state and industrial partners established competence centres and as a result of the innovation initiative, Upper Austrian Research was created. (Stahlecker and Fraunhofer ISI 2012) Due to positive evaluation of the program and recommendations for further continuation, a subsequent initiative called “Innovative Upper Austria 2010” was launched.

5.1.2 Innovative Upper Austria 2010

Innovative Upper Austria 2010 was launched in 2005 with a € 600 million budget and lasted until 2010. The plan was prepared by two hundred and fifty experts, who developed eighteen strategies and forty three measures in the spheres R&D, professional qualifications, clusters and networks.” (Land Oberösterreich 2014) Special support was provided to networks of science and industry in the mechatronics, life science, ICT, innovative materials, and logistic sectors. Cooperation ties between universities, industries, and the government were further developed and strengthened. Special attention was paid to human resources trainings. (Janssen, den Hertog, and Kuusisto 2014; Land Oberösterreich 2014; Stahlecker and Fraunhofer ISI 2012)

5.1.3 Innovative Upper Austria 2010plus

Innovative Upper Austria 2010plus was launched in 2010, with a budget of € 450 million and lasted until 2013. Fourteen strategies, thirty-seven measures, and one hundred and twenty projects were designed and developed, and they focused on the same aspects as the previous Innovative Upper Austria 2010 programme. Topics such as international student exchange programmes, renewable energy, promotion and development of knowledge-intensive services and more were supported within the programme. More than half of the overall budget was allocated to the research and development. A strategy to focus on innovative niches and not just to follow latest trends was set. (Janssen, den Hertog, and Kuusisto 2014; Land Oberösterreich 2014)

5.1.4 Innovative Upper Austria 2020

The current regional strategic programme runs from 2014 until 2020 and is called Innovative Upper Austria 2020. Its basis stems from previous projects; nevertheless, a novel approach was selected. The plan supports the vertical orientation “Education-Research-Economy Innovation Chain” among identified

fields of interest. There are 4 core aspects of the project; “Location Development, Industrial Market Leadership, Internationalization, and Future technologies”. (Land Oberösterreich 2014) The initiative is set to advance smart specialization development. A budget of € 225 million was assigned from Upper Austrian ministries, and further € 900 million was provided by third parties and project partners for the duration of the programme. The core strategy within the Industrial Market Leadership is to support research in sectors where Upper Austria is excelling, invest into knowledge-intensive services and adaptable production systems, and to become a leader in innovative niches. Location Development strategy comprises efforts to attract best scientists and business minds to move to Upper Austria, strengthen research and development activities, and improve prosperity of the region.

Internationalization efforts include further development of international education, research, and businesses, as well as providing support to local companies operating on international scale. Recognition of future global trends and improvement of engineers and researchers’ image within the society is a part of the Future Technologies strategy. Moreover, the project supports transition to Industry 4.0 manufacturing systems, smart material usage, as well as improving aspects of the overall quality of life (nutrition, health etc.) The overall aim of the project is to make Austria an innovation leader, and not only an innovation follower. (Land Oberösterreich 2014)

5.2. National programmes

The main national programme described in this chapter is the “Strategy for research, technology and innovation of the Austrian Federal Government”, which aims to make Austria one of the innovation leaders worldwide.

5.2.1 Strategy for research, technology and innovation of the Austrian Federal Government

The research, technology, and innovation (RTI) strategy of Austrian Federal Government is a program that launched in 2011, and its goal is to “realise potential, increase dynamics, create the future: to become an innovation leader”. The primary motivation is to make Austria one of the innovation leaders by 2020 and to strengthen innovation processes and research structures, increase the efficiency of the government, and foster cooperation between research, industry, and education. The development of the strategy was a comprehensive multi-layer process consisting of nation-wide dialogues with stakeholders, complex

evaluation of funding systems, and cooperation with experts from six ministries. The programme identifies Austria's current challenges in numerous spheres.

Firstly, Austria is not using its human resources optimally, and there is a lack of interest for technical fields among the citizens. Secondly, there is a lack of venture capital hindering investment-intensive early stages of growth for young innovative companies. Moreover, government structures are not cooperating enough, and this problem could hinder Austria's innovation activities and potential. One of the objectives of the RTI strategy is to further develop the potential of science, research, and innovation in Austria in order to become an innovation leader by 2020. The vision is to make radical innovation a common occurrence. Furthermore, the education system will ensure development of creative and innovative thinking. Interest in technical sciences would grow by sufficient promotion.

Another aim of the project is to ensure adequate financing for universities, universities of applied sciences, and non-university education facilities. Research activities at educational institutes will be encouraged. The export of highly innovative technology and products would make Austrian companies well established and known as innovation leaders worldwide. (Republik Österreich 2011) For each region, specific steps are designed according to the current local strategies. The table shown below describes the specific priorities for Upper Austria.

The following priorities with potential areas were selected for the programme:

1. Manufacturing process- Mathematical modelling, software architecture/control processes, data security, hardware, surface/material development, testing systems, production/process engineering and optimization, energy/resource management
2. Energy- Decentralised, customer-oriented systems (e.g. smart grids), network load management/monitoring, renewable energies, building/civil engineering
3. Health and aging society- Medical information systems (eHealth)/software (e.g. virtual surgery, image analysis), equipment/materials, telemetric, personalizes diagnostics, prevention, therapy
4. Food and diet- Ingredients/modified food, materials/packaging, food quality/safety, measurement procedure, production engineering

5. Mobility and logistics- Traffic, logistics, supply chain management, vehicle technologies and propulsion technology, lightweight structural construction (BMVIT and BMWFW 2015)

5.3. International programmes

This chapter describes the international programmes supporting innovation and research and development in the Upper Austrian region. It focuses namely on three programmes; Horizon 2020, Europe region Danube-Vltava, and Danube region innovation strategy programme.

5.3.1 Horizon 2020

“Horizon 2020” is the biggest project of the European Union for research and innovation. Launched in 2014 and active until 2020, the assigned budget was € 80 billion. The initiative aims to secure global competitiveness of the EU. The main pillars and aims of the programme are to ensure industrial leadership, tackle societal problems, increase the competitiveness impact provided by research and innovation centres, and reach the level of excellence of the research and development activities and facilities. It also aims to shorten the time to develop and launch new projects, and remove barriers hindering the cooperation of public and private spheres. (Danube Region Strategy 2017a; European Commission 2017)

5.3.2 Europe region Danube-Vltava

The program “Europe region Danube-Vltava” is an economic, social, and community development project of Austria, the Czech Republic, and Germany. Seven partner regions are a part of the program; Upper Austria, Lower Austria, Lower Bavaria with Altötting, Upper Palatinate, Pilsen region, South Bohemian region, and Vysočina region. The areas of interest include research and innovation, cooperation of universities, qualified workforce market, tourism, mobility and transport, and cooperation of clusters and companies. Among the goals of the Danube-Vltava region is to create a prosperous economic space, and to develop a dynamic region with attractive future for its inhabitants. Moreover, the aim is to support competitiveness of the local companies, create more jobs by supporting cross-border cooperation, and preserve natural and cultural areas. (Europaregion Donau Moldau 2017)

5.3.3 Danube region innovation strategy

The area of the Danube region innovation strategy stretches from Black Forest to the Black Sea, and includes Austria, the Czech Republic, Slovakia, Germany, Slovenia, Croatia, Moldavia, and others. The goals of the programme are divided into 4 main pillars and 12 priority areas. The first priority area consists of waterways mobility, rail-road-air mobility, sustainable energy, and culture and tourism. The second area covers topic such as water quality, environmental risks, and biodiversity and landscapes. The third pillar deals with issues concerning knowledge society, competitiveness of enterprises, and people and skills. The last priority area offers support in institutional capacity and cooperation, and security spheres. The strategic programme has been implemented through frequent policy discussions and cooperation of executed policies. Moreover, the project aims to strengthen the cooperation basis for the participating states, and to establish grounds for possible future collaboration. The existing common projects include, for example, CluStat (a project supporting innovation potential of clusters in the Danube region), DaHar (harmonizing long-term logistic development), or TourNet (to support alternative tourism in the region). (Danube Region Strategy 2017b, 2017c)

6. Conclusion

There is a large variety of external impulses within the Upper Austrian region. Numerous technology centres, incubators, and agencies provide consulting and support not only to SMEs, but also to larger companies and other entities to guide their innovation efforts and increase their competitiveness and resource efficiency. To such organizations belong the Austrian Research Promotion Agency, Austrian Science Fund, Business Upper Austria, and others. Moreover, there are various funding schemes and grants supporting SMEs, start-ups, research entities, larger companies, and NGOs in a large variety of industries. Furthermore, there is a network of universities and universities of applied sciences, which cooperate with local business entities in research and development. There is a complex structure of innovation programmes on international, national, and regional levels with a long history of innovation activities. To sum up, the companies operating in the Upper Austria regions have a large number of external impulses helping them in their innovation efforts and projects, providing financial and knowledge-based guidelines, forming a fertile environment for present and future innovation activities.

7. References

- AIT (2018a), "Center for Innovation Systems & Policy - AIT Austrian Institute Of Technology," [available at <https://www.ait.ac.at/en/about-the-ait/center/center-for-innovation-systems-policy/>].
- (2018b), "Innovation Strategies - AIT Austrian Institute Of Technology," [available at <https://www.ait.ac.at/en/solutions/innovation-strategies/>].
- (2018c), "Innovation Systems & Digitalisation - AIT Austrian Institute Of Technology," [available at <https://www.ait.ac.at/en/research-fields/innovation-systems-digitalisation/>].
- aws (2018a), "aws IP.Coaching," [available at <https://www.aws.at/foerderungen/aws-ipcoaching/>].
- (2018b), "aws IP.Market," [available at <https://www.aws.at/foerderungen/aws-ipmarket/>].
- BMVIT and BMWFV (2015), "Austrian Research and Technology Report 2015," Business Upper Austria, "Unterstützung von Technologie-Start-ups," [available at <https://www.biz-up.at/en/promoting-innovation/support-for-technology-start-ups/>].
- (2017a), "Förderungen und Förderberatung für Unternehmen und Forschungsinstitutionen," [available at <https://www.biz-up.at/en/promoting-innovation/advice-on-obtaining-funding/>].
- (2017b), "Schutzrechtsberatung," [available at <https://www.biz-up.at/en/promoting-innovation/advice-on-property-rights/>].
- (2017c), "Über uns," [available at <https://www.biz-up.at/en/about-us/>].
- (2017d), "Unterstützung bei Innovationsprojekten," [available at <https://www.biz-up.at/en/promoting-innovation/support-for-innovation-projects/>].
- Danube Region Strategy (2017a), "EU Funding Instruments," (accessed April 8, 2017), [available at <http://www.danube-region.eu/funding/private-sector-2>].
- (2017b), "Priority Areas," (accessed April 5, 2017), [available at <http://www.danube-region.eu/about/priorities>].
- (2017c), "Projects and Initiatives," (accessed April 5, 2017), [available at <http://www.danube-region.eu/funding/projects-and-initiatives>].
- Europaregion Donau Moldau (2017), "Evropský region Dunaj-Vltava (ERDV)," (accessed April 8, 2017), [available at <http://www.evropskyregion.cz/onas/evropsky-region.html>].

European Commission (2017), "Horizon 2020 - European Commission," (accessed April 8, 2017), [available at <http://ec.europa.eu/programmes/horizon2020/en/h2020-sections>].

FFG (2017a), "About the FFG | FFG," [available at <https://www.ffg.at/en/content/about-ffg>].

——— (2017b), "European and International Programmes | FFG," [available at <https://www.ffg.at/en/content/european-and-international-programmes>].

——— (2017c), "Organisational Structure | FFG," [available at <https://www.ffg.at/en/content/organisational-structure>].

——— (2017d), "Results & Impacts | FFG," [available at <https://www.ffg.at/en/content/results-impacts>].

——— (2017e), "Structural Programmes | FFG," [available at <https://www.ffg.at/en/content/structural-programmes>].

——— (2017f), "Thematic Programmes | FFG," [available at <https://www.ffg.at/en/content/thematic-programmes>].

——— (2018a), "Active and Assisted Living Programme (AAL Programme) | FFG," [available at <https://www.ffg.at/active-and-assisted-living-programme-aal-programme>].

——— (2018b), "AplusB - Academia plus Business | FFG," [available at <https://www.ffg.at/en/aplusb-academia-plus-business>].

——— (2018c), "AT:net - Markteinführungsprojekt für digitale Anwendungen und Produkte (IKT) | FFG," [available at <https://www.ffg.at/atnet>].

——— (2018d), "Austrian Space Applications Programme | FFG," [available at <https://www.ffg.at/en/austrian-space-applications-programme>].

——— (2018e), "benefit | FFG," [available at <https://www.ffg.at/en/benefit>].

——— (2018f), ""Beyond Europe" | FFG," [available at <https://www.ffg.at/en/beyond-europe>].

——— (2018g), "BRIDGE - the Programme | FFG," [available at <https://www.ffg.at/en/bridge>].

——— (2018h), "CEDR TRANSNATIONAL ROAD RESEARCH PROGRAMME | FFG," [available at <https://www.ffg.at/cedr>].

——— (2018i), "COIN - Cooperation and Innovation | FFG," [available at <https://www.ffg.at/en/coin-cooperation-and-innovation>].

——— (2018j), "COMET - Competence Centers for Excellent Technologies | FFG," [available at <https://www.ffg.at/en/comet-competence-centers-excellent-technologies>].

- (2018k), “ECSEL – the Programme | FFG,” [available at <https://www.ffg.at/en/ecsel-programme>].
- (2018l), “Energieforschung - Das Programm | FFG,” [available at <https://www.ffg.at/Energieforschung-das-Programm>].
- (2018m), “ERA-NET | FFG,” [available at <https://www.ffg.at/en/era-net>].
- (2018n), “EUREKA | FFG,” [available at <https://www.ffg.at/en/europe/eureka>].
- (2018o), “Global Incubator Network | FFG,” [available at <https://www.ffg.at/en/global-incubator-network>].
- (2018p), “Innovation Voucher | FFG,” [available at <https://www.ffg.at/en/innovation-voucher>].
- (2018q), “Patent.Voucher - the Programme | FFG,” [available at <https://www.ffg.at/en/patent-voucher>].
- (2018r), “Production of the Future – the Programme | FFG,” [available at <https://www.ffg.at/en/production-future-programme>].
- (2018s), “R&D Competences for Industry | FFG,” [available at <https://www.ffg.at/en/rd-competences-industry>].
- (2018t), “Research and development in Austria,” [available at <https://www.ffg.at/en/content/rd-austria>].
- (2018u), “Service Innovations Initiative | FFG,” [available at <https://www.ffg.at/en/service-innovations-initiative>].
- (2018v), “SME Package | FFG,” [available at <https://www.ffg.at/en/sme-package>].
- (2018w), “Stadt der Zukunft – Das Programm | FFG,” [available at <https://www.ffg.at/stadt-der-zukunft-das-programm>].
- (2018x), “TAKE OFF | FFG,” [available at <https://www.ffg.at/en/take-off>].
- FWF (2017a), “Corporate Policy,” [available at <https://www.fwf.ac.at/en/about-the-fwf/corporate-policy/>].
- (2017b), “Science Europe,” [available at <https://www.fwf.ac.at/en/about-the-fwf/international-activities/science-europe/>].
- Heuristic (2017), “Heuristic – OPEN INNOVATION AGENCY,” [available at <http://heuristic.at/>].
- Innovation Austria (2017), “Structure - Innovation Austria,” [available at <https://www.innovationaustria.at/structure.html>].
- Janssen, Matthijs, Pim den Hertog, and Jari Kuusisto (2014), “ESIC European Service Innovation Centre Report: Summary Assessment of Upper Austria,” European Commission.

- JKU (2017a), "COMET," (accessed November 30, 2017), [available at <http://www.jku.at/content/e263/e258901/e258813>].
- (2017b), "Research centers and networks," (accessed November 30, 2017), [available at <http://www.jku.at/content/e263/e258901>].
- (2017c), "Research infrastructure," (accessed November 30, 2017), [available at <http://www.jku.at/content/e263/e250321>].
- Land Oberösterreich (2014), "Strategic economic and research programme : Innovative Upper Austria 2020," TMG, Linz.
- Republik Österreich (2011), "Realising potentials, increasing dynamics, creating the future: Becoming an Innovation Leader. Strategy for research, technology and innovation of the Austrian Federal Government," Vienna.
- Stahlecker, Thomas and Fraunhofer ISI (2012), "Regional Innovation Monitor Regional Innovation Report (Upper Austria) To the European Commission Enterprise and Industry Directorate-General Directorate D – Industrial Innovation and Mobility Industries," Brussels.
- tech2b (2018a), "Business Development (b2e) - tech2b," [available at <https://www.tech2b.at/PostIncubation>].
- (2018b), "Gründungsberatung (AplusB Scale-up) - tech2b," [available at <https://www.tech2b.at/gruendungsangebot/gruendungsberatung-aplusb-scale-up>].
- (2018c), "Gründungsvorbereitung - tech2b," [available at <https://www.tech2b.at/PreIncubation>].
- (2018d), "tech2b und seine Partner - tech2b," [available at <https://www.tech2b.at/ueber-tech2b>].
- TIC-Steyr (2018), "Services," [available at <https://tic-steyr.at/tic-steyr/services?language=en>].
- UAR (2018a), "Application-oriented Research as a Key to Success - Upper Austrian Research GmbH // EN," [available at <https://www.uar.at/en/services/application-oriented-research>].
- (2018b), "International Networking - Upper Austrian Research GmbH // EN," [available at <https://www.uar.at/en/services/international-networking>].
- (2018c), "Research for Business - Upper Austrian Research GmbH // EN," [available at <https://www.uar.at/en/services/research-for-business>].
- University of Applied Sciences Upper Austria (2018a), "Main areas of research - FH OOE," [available at <https://forschung.fh-ooe.at/en/main-areas-of-research/>].
- (2018b), "Research & Development - FH OOE," [available at <https://forschung.fh-ooe.at/index.php?L=1&id=4927>].

University of Art and Design Linz (2017), "Profile," (accessed November 30, 2017), [available at <http://www.ufg.ac.at/Profile.1208+M52087573ab0.0.html>].

Upper Austrian Research GmbH (2017a), "Medical Technologies - Upper Austrian Research GmbH // EN," [available at <https://www.uar.at/en/research-fields/medical-technologies>].

——— (2017b), "Research Fields - Upper Austrian Research GmbH // EN," [available at <https://www.uar.at/en/research-fields/production-research>]].