



# Mapping of EU Member States' / regions' Research and Innovation plans & Strategies for Smart Specialisation (RIS3) on Bioeconomy

## Task 3

## Case Study Report Upper Austria

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## 1. Short Regional Bioeconomy Profile

<b>Name of the case region/country</b>	Oberösterreich (Upper Austria)
<b>Member State</b>	Austria
<b>GDP – Euro per capita (2014)*</b>	39 200
<b>Total ESIF Research &amp; Innovation per capita per year*</b>	4.52
<b>Total H2020 per capita per year*</b>	12.07
<b>Value Chain Approach to the Bioeconomy**</b>	Biomass processing and conversion, Bioeconomy R+I and Tech Support
<b>Thematic Focus of the Bioeconomy Approach**</b>	Agro–Food
<b>Research and Innovation Fields highlighted for the Bioeconomy**</b>	Biology, Biotechnology, Chemistry, Life Sciences, Nano Technologies   Logistics and Packaging, Processing   Advanced Manufacturing, Machineries
<b>Bioeconomy Activity Level**</b>	middle
<b>CASE STUDY SUMMARY</b>	
<b>Bioeconomy Approach</b>	Strategic economic and research programme „Innovative Upper Austria 2020“ is a comprehensive and broad legitimation for funding initiatives in Upper Austria, research funding in Upper Austria is carried out in cooperation with Austrian Research Promotion Agency (FFG)
<b>Bioeconomy Ecosystem</b>	Original interest in bioeconomy derives from companies in the field of wood and renewable raw materials, in the past few years general positive political opinion–forming processes in the field of bioeconomy at regional, national and EU–level
<b>Bioeconomy Policy Support</b>	National bioeconomy strategy, no specific regional strategy for the bioeconomy sector available. However, the regional strategic economic and research programme „Innovative Upper Austria 2020“ comprises bioeconomic issues; since 2006 cooperation between FFG and Upper Austria in research funding, cooperation contractually fixed for 2014–2020
<b>Successful initiatives and Good Practices</b>	Kompetenzzentrum Holz GmbH (Wood K plus), Upper Austrian Food Cluster
<b>Main Needs, Gaps and Bottlenecks</b>	More investments in research infrastructure are essential, e.g. pilot plants; lack of appropriate staff: universities should set more focus on bioeconomic issues; energy field: density of research in companies and non–university institutes considerably lower than in the area of industrial production processes or Mobility/Logistics, strategy: stakeholder networking

	and focusing on key joint projects; food sector: little research resources available, strategy: linking of innovative regional companies with appropriate players in the research sector; EC should simplify the requirements for its funding programs, because of the enormous organizational effort to handle large consortia
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\* Source of the data: S3 – Regional Viewer: <http://s3platform.jrc.ec.europa.eu/synergies-tool>

\*\* Data collected by this Study project in Task 1.

## 2. Regional Bioeconomy Ecosystem

This chapter describes the general characteristics of the regional bioeconomy ecosystem, its origins, main stakeholders and driving forces. It gives an overview on the recent evolution and trends on bioeconomy-related issues in the area and some of the main activities and initiatives.

### 2.1 Origin of Interest of the region in the Bioeconomy

The original interest in bioeconomy derives from several areas: At first it derives from the economy, in particular companies in the field of wood and renewable raw materials. Leading companies in this area are Lenzing and Agrana.

There is also a strong involvement of other sectors:

- agricultural sector: Animal breeding, seed breeding, feed producers (e.g. Fixkraft, Delacon Biotechnik)
- industrial processing: Efko, Spitz, Vivatis, Brauunion
- plastics production: Borealis

Biotechnology research is not strongly represented in Upper Austria. There is a lack of companies operating in biotechnology. Upper Austria has been lagging behind the developments in this research area and is wedged in between the biotechnology centers Munich and Vienna. The University of Applied Sciences Upper Austria offers programmes for biotechnology and environmental technology.

In the past few years a general positive political opinion-forming processes is seen in the field of bioeconomy at regional, national and EU-level. Politicians have recognized that bioeconomy will become an important part of future economy. It is anticipated that investments in bioeconomy lead to independence from fossil resources. Also, bioeconomy contributes to maintain infrastructure in rural areas and thus to strengthen rural areas, which is an important socioeconomic factor. However, it is also important to estimate the relevance of the bioeconomy in Upper Austria in comparison to other economic sectors: sectors such as the steel industry (voestalpine), the basic materials industry and the automotive sector have are very strong position in Upper Austria.

### 2.2 Bioeconomy Stakeholders

Upper Austrian stakeholders in the field of bioeconomy are the following:

- **Regional government of Upper Austria**, Department of Economics
- **Business Upper Austria**, the business agency of the regional government of Upper Austria, is an innovation driver and a partner for location

development & settlement of companies, cooperation and public funding advisory services. As a one-stop shop, they assist domestic and foreign companies by supplying tailor-made services and support them from the initial business idea through to market success. Web: <http://www.biz-up.at/en/> E-Mail: [info@biz-up.at](mailto:info@biz-up.at)

- **Upper Austrian Research GmbH (UAR)**, a subsidiary of OÖ Landesholding GmbH, is the leading organization for non-university research of the federal province of Upper Austria and a key player in the research, technology and innovation policy. The task of UAR is to support the province of Upper Austria in its work relating to research policy and its development of research programmes with the aim of establishing and strengthening research competencies in the key areas of local business. UAR does not pursue any own research and development activities, but it is a shareholder in international leading research centres. 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. With precisely directed communications activities the UAR also increases the national and international visibility of research achievements and supports the positioning of the Upper Austrian research community. Web: <http://www.uar.at/en/home> E-mail: [office@uar.at](mailto:office@uar.at)
- The **Kompetenzzentrum Holz GmbH (Wood K plus)** is a non-university research institution for new materials and process technology for wood and related renewable raw materials and carries out the function of a catalyst in these areas. Its core competencies include materials research and process technology along the entire value creation chain, from the raw materials to the finished product. Details see chapter 4.1. Web: <http://www.wood-kplus.at/en> E-mail: [b.hultsch@kplus-wood.at](mailto:b.hultsch@kplus-wood.at)
- The universities are not so strongly represented in the field of bioeconomy – this is not their core area. The most important stakeholders are the chemistry institutes and the energy institute at the Johannes Kepler University (JKU). Web: <http://www.jku.at> E-Mail: [info@jku.at](mailto:info@jku.at) The University of Applied Sciences Upper Austria offers programmes for food technology and nutrition and biotechnology and environmental technology. Web: [www.fh-ooe.at](http://www.fh-ooe.at) E-Mail: [info@fh-wels.at](mailto:info@fh-wels.at)
- Large companies:
  - in the agricultural sector: Animal breeding, seed breeding, feed producers (e.g. Fixkraft, Delacon Biotechnik)
  - in industrial processing: Efko, Spitz, Vivatis (brand Landhof), Brauunion

- in plastics production: Borealis (worldwide research and development centre in Linz with more than 450 international experts from over 30 nations)
- in the field of wood and renewable raw materials: Lenzing, Agrana
- Representation of interests: Chamber of Agriculture, Chamber of Commerce

Austria-wide stakeholders are:

- **Bioeconomy Austria** aims at concentrating all Austrian efforts to push and promote the national bioeconomy development process. Furthermore, Bioeconomy Austria provides a platform for coordination and capacity building to all relevant players. Research, agriculture, forestry, the economy and industry should be closely interlinked in order to exploit as many synergies as possible, to facilitate optimum coordination and to help bring innovations in research and the lab to the market. Web: <http://www.bioeconomy-austria.at/en/> E-Mail: [info@bioeconomy-austria.at](mailto:info@bioeconomy-austria.at)

### 2.3 Bioeconomy – strategies, plans and projects

There is a **national bioeconomy strategy for Austria** which covers several themes, called “FTI strategy for the biobased industry in Austria” (BMVIT, 2014 “FTI-Strategie für die biobasierte Industrie in Österreich”) and a national action plan (BMLFUW, 2015 “Aktionsplan zur stofflichen Nutzung nachwachsender Rohstoffe”). Both of these documents cover a wide range of bioeconomy themes, value chain approaches and R&I activities.

In Upper Austria, the only regional strategy that concerns bioeconomy is the strategic economic and research programme „Innovative Upper Austria 2020“ which has been formulated for the years 2014 to 2020 on behalf of the Upper Austrian Ministries of Economics and Research. The Program "Innovative Upper Austria 2020" is equivalent to a RIS3 strategy and is a comprehensive and broad legitimation for funding initiatives in Upper Austria.

There is no specific sub-strategy for the bioeconomy sector available – also not for other subsectors of the Upper Austrian Economy.

### 3. Bioeconomy Policy Support

This chapter gives a brief account of the existing policy instruments and action lines to support the bioeconomy in the area. It highlights the most important value chain approaches to promote the bioeconomy, the thematic focus of the Bioeconomy-related research and innovation, as well as some of the research fields that are relevant for further deployment of the bioeconomy.

#### 3.1 General support framework

Following three strategic programmes for Upper Austria in the period from 1998 to 2013, a strategic economic and research programme „Innovative Upper Austria 2020“ has been formulated for the years 2014 to 2020 on behalf of the Upper Austrian Ministries of Economics and Research.

The programme was developed by Business Upper Austria – OÖ Wirtschaftsagentur GmbH and Upper Austrian Research GmbH in conjunction with high-ranking representatives of the social partners and the Upper Austrian Council for Research and Technology, and is supported by a study of the opportunities the programme can create for the area carried out by the Austrian Institute of Economic Research. Upper Austria's new strategic business and research programme "Innovatives OÖ 2020" was launched on 22/01/2014. Upper Austrian Research GmbH put forward all the research topics in the corresponding fields of action which are relevant to Upper Austria and successfully presented the competencies of Upper Austrian research as well as those of all the non-university research institutions. These future research topics are based especially on the available scientific expertise on the one hand, and the close cooperation with trade and industry on the other. What was particularly notable in this connection was the creation of the first-ever comprehensive competence matrix of the Upper Austrian research scene which not only includes the non-university institutions, but also the competencies of the JKU and the University of Applied Sciences Upper Austria.

The programme follows the approach in technology policy of consistent vertical orientation along the education–research–economy innovation chain within defined fields of activity. Building on the core strategies of regional development, industrial market leadership, internationalisation and future technologies, and derived from the development of European research policy and technological core competencies of the region, five fields of activity have been defined for Upper Austria. These five fields – **Industrial Production Processes, Energy, Health&Ageing, Society, Food&Nutrition, Mobility&Logistics** – enable Smart Specialisation. The programme „Innovative Upper Austria 2020“ is acknowledged as a research and innovation strategy for smart specialisation – according to the RIS3 Strategy of the European Commission.



The programme formulates for each field of activity strategic, educational, research and economic policy topics and measures. In the field of “Food&Nutrition” the following measures have been formulated: Food production region 2050 (e.g.cross-sectoral innovations, value chains, lead companies, involvement in European initiatives), strengthening the new University of Applied Sciences (FH) course programme in food technology and nutrition, bioplastics materials in the food industry; further development of the clusters, particularly in the area of technology transfer and cross-sector innovation; increase in company innovation capabilities and internationalisation; support for lead companies, headquarters and SMEs in specific niches with high growth potential through specific offers and offers in cooperation with partners in the innovation system, etc.

In the activity field “Energy” renewable energies are mentioned as one of the central research topics. Within this research area the following topics and measures are defined as focus points: material and energetic use of biomass, energy from organic secondary raw materials, renewable energy technologies, Promotion of renewable energies in SMEs through suitable programmes. (Web: [www.ooe2020.at](http://www.ooe2020.at/files/download_programmbuch_web_english.pdf) [http://www.ooe2020.at/files/download\\_programmbuch\\_web\\_english.pdf](http://www.ooe2020.at/files/download_programmbuch_web_english.pdf))

### 3.2 Bioeconomy Policy Support

The regional strategy that concerns bioeconomy is the strategic economic and research programme „Innovative Upper Austria 2020“ which has been formulated for the years 2014 to 2020 on behalf of the Upper Austrian Ministries of Economics and Research. The Program "Innovative Upper Austria 2020" is a comprehensive and broad legitimization for funding initiatives in Upper Austria.

There is no specific strategy for the bioeconomy sector available – also not for other subsectors of the Upper Austrian Economy. This also applies to funding schemes.

In Upper Austria, there are generally three types of programs available for funding Research&development:

- Regional programs funded by the regional government of Upper Austria
- National programs funded by the Austrian Research Promotion Agency FFG
- EU programs

Research funding in Upper Austria is carried out in cooperation with FFG. Since 2006 there has been cooperation between the FFG (Austrian Research Promotion Agency) and Upper Austria in research funding. This cooperation was contractually fixed for the years 2014–2020. Upper Austrian research projects have the option to receive – in addition to FFG's usual subsidy amount of approximately 50% – an increased FFG loan from Upper Austrian funds for a further 20% of the project costs.

For small and medium-sized enterprises, Upper Austria assigns an additional SME bonus in the form of a grant. If Upper Austrian companies cooperate with one or more Austrian research institutes, they are eligible to receive a cooperation bonus. The costs of the R&D institutions are funded up to 75% in the form of a non-repayable subsidy. (Web: <https://www.ffg.at/oberoesterreich>)

In total, Upper Austria spent EUR 1.7 billion on R&D in 2013, compared to EUR 900 million in 2006. The R&D quota in Upper Austria is 3.15% of the gross regional product, the average for Austria is 2.96%. 73.2% of the R&D funds derive from the enterprises. The average value for Austria is 47.2%. Only about a quarter of R&D spending in Upper Austria derives from public funding. It is not possible to estimate the share of the bioeconomic sector.

From the FFG basic funding program, Upper Austria received EUR 77.3 million EUR in the year 2014. Upper Austria thus achieves the highest subsidy sums of all Austrian federal states – about a quarter of the total federal funding.

The thematic funding programs of the FFG cover a total of 20 top issues – 3 of them have the focus on the bioeconomic sector: energy storage and transformation, renewable energies, life sciences. From these thematic programs, Upper Austria received around 15 million euros in the period 2013–2015. In comparison, Upper Austria received around 150 million euros from thematic funding programmes in the field of industrial production and materials technology. These data show the importance of Upper Austria as an industrial location. Research projects are often integrated into industrial processes, e.g. energy and resource efficiency. It is difficult to distinguish the bioeconomic sector in Upper Austria from other economic sectors – many bioeconomic themes are hidden among other topics.

The national funding programme COMET (Competence Centers for Excellent Technologies) of the FFG (Austrian Research Promotion Agency) was launched in 2006 and promotes the creation of competence centres which are based on a research programme established jointly by science and industry. The competence centres programmes are internationally recognised as best-practice model and have been among the most successful technology policy initiatives in Austria. The programme addresses existing competence centers and networks, as well as new consortia with participants from science and industry. All three programme lines are thematically open, but every center and every research project must have a defined theme. Target group comprises SMEs, Large enterprises, Universities, Universities of applied sciences, Competence centres and Research facilities. Some topics cover also bioeconomic aspects, such as life sciences, materials and production, environment and energy.

Since 2011, the Upper Austrian Research GmbH (UAR) has been coordinating all activities conducted under the COMET scheme and has initiated a number of measures.

COMET is sponsored by the Ministry for Transport, Innovation and Technology (BMVIT) and the Ministry of Science, Research and Economy (BMWFW), which are following up on the success of their previous competence center programmes. The Austrian provinces also support COMET with additional funds – in Upper Austria the Department of Economics of the regional government. The Austrian Research Promotion Agency FFG is responsible for the management of COMET.

Web: <https://www.ffg.at/en/comet-competence-centers-excellent-technologies>

In Upper Austria, there are funding programs for customers (private and commercial) that promote investments in renewable energy infrastructure, for example biomass, solar energy, geothermal energy and district heating.

### 3.3 ESIF and H2020 resources for the Bioeconomy

R&D-projects in Upper Austria in the field of Bioeconomy are funded by regional, national and EU-funding.

In the scope of the Horizon 2020 programme, the European Commission requires that project proposals have to be complementary to regional bioeconomic strategies. In Upper Austria – as well as in other Austrian provinces – there is no specific strategy for the bioeconomic sector available. To overcome this obstacle, the regional government of Upper Austria is assisting project applicants with specific declarations of support.

In the course of individual research projects in the bioeconomy sector synergy effects occur, e.g. synergies between the EU funding programs Horizon 2020 and ESIF.

An overview of the financial resources 2014–2020 for research and innovation in the region from the ERDF (TO 1), H2020 and the 7th Research Framework Program 2007–2013 is not available. This also applies to the funds that are the bioeconomy. The sub-sectors of the Upper Austrian Economy are assigned to different departments of the regional government of Upper Austria.

## 4. Successful Initiatives and Good Practices

This chapter highlights successful initiatives and good practices to promote research and innovation in bioeconomy-related fields.

### 4.1 Kompetenzzentrum Holz GmbH (Wood K plus)



The Kompetenzzentrum Holz GmbH (Wood K plus) is a leading non-university research institute for new materials and process technology for wood and wood-related renewable raw materials. Its core competencies include materials research and process technology along the complete value chain, from the raw materials to the finished products. The competence centre develops methods and basics and performs applied research on the economy-science interface. Relevant Austrian companies and scientific bodies have bundled their strengths in the Kompetenzzentrum Holz. Currently it cooperates with 150 companies and 50 scientific research institutes. The total budget amounts to around 10 million Euros. Its aim is to establish national and international projects with a research volume of at least 12 million Euros per year by 2020. 50% of the budget is handled via the COMET programme. The remaining 50% are handled via EU funding programs, national research funding (FFG), funding from the „Innovative Upper Austria 2020“ programme and projects direct financed by industrial companies. The research projects are very application-oriented – in 90% of the research projects, industrial enterprises are involved. Within the scope of the COMET program, the competence centre is cooperating with 26 partner companies. This results in 100–150 research projects.

Research is carried out at four locations: Linz, Lenzing, Tulln and St. Veit/Glan – the head office is located at Linz. The competence centre was founded in 2001. The initiative to found the competence centre originated from major leading companies: Borealis, Lenzing, Egger, Fundermax. The founding members are: Johannes Kepler University Linz (JKU), Borealis and Lenzing.

The key activities in the competence centre are the followings:

- wood chemistry & biotechnology
- wood polymer composites
- wood & paper surface technologies
- wood materials technologies
- market analysis and innovation research.

The Shareholders of the competence centre are: Upper Austrian Research GmbH (48%), BABEG Kärntner Betriebsansiedlungs- und Beteiligungsgesellschaft m.b.H.

(26%), the Johannes Kepler University Linz (13%), the University of Natural Resources and Life Sciences Vienna (13%)

The Kompetenzzentrum Holz receives funds as a K1 centre under the national COMET competence centre scheme. Despite initial skepticism, the competence center is now a flagship K1 center and is cross-linked with other sectors of the Upper Austrian economy, e.g. the automotive industry.

Funding Providers und Funding Projects

The Kompetenzzentrum Holz GmbH is a Competence Center for Excellent Technologies under the national funding programme COMET.

The COMET programme of the Kompetenzzentrum Holz GmbH is funded by:

- Austrian Research Promotion Agency (FFG)
- Regional government of Upper Austria, Department of Economics
- Province of Carinthia, Carinthian Economic Development Fund (KWF)
- Province of Lower Austria
- University of Natural Resources and Applied Life Sciences Vienna
- Johannes Kepler University Linz (JKU)
- Vienna University of Technology

The Projects & Services Area of the Kompetenzzentrum Holz GmbH is funded by (selection):

- Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW)
- European Regional Development Fund (ERDF)
- European Union, Horizon 2020
- Province of Carinthia, Carinthian Economic Development Fund (KWF)
- Regional government of Upper Austria, Department of Economics
- Province of Lower Austria
- Austrian Research Promotion Agency (FFG): basic programme, Bridge, COIN, research partnerships, Innovationsschecks, mobility of the future, production of the future, qualification network, talents (FEMtech, regional)

In the course of research projects synergy effects occur, e.g. synergies between H2020 and ESIF on Bioeconomy.

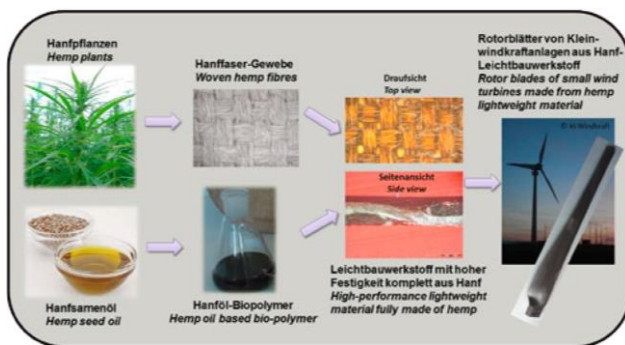
Currently, 120 people are employed by the Kompetenzzentrum Holz, 40 of which are doctoral students. The competence center offers them training opportunities. They are working for example on a research project for an industrial company. This cooperation is a win-win situation for all participants: the industrial enterprise receives latest research findings, the student is expanding his skills, the university gets an insight into current research topics. The companies often take over the

doctoral students as employees after finishing the research project. This results in sustainability effects.

The competence center is networking with large companies (e.g. Lenzing), which have a higher status than the companies in the food industry.

Practical application in the field of green composites

The project Green2Green pursues the development of rotor blades of small wind turbines from a fully hemp-based lightweight material. The project aims to substitute the glass fiber reinforced polymer composites that are currently used in the construction of Green Technology small wind turbines. The development of the new material is based on industrial hemp plants that are cultivated in the nearby region and can be used as single renewable feedstock for the polymeric matrix and for fiber reinforcement (Green Composite). The researchers considered all aspects of the value chain: from cultivation and harvesting of hemp, oil and fiber production to assembly of the wind turbine. Green2Green is a cooperative project of the Kompetenzzentrum Holz, the Department of Polymer Engineering and Science at the Montanuniversität Leoben in the UAttrian province Styria and Waldland estate that cultivates the hemp. The project is funded by the Austrian Ministry for Transport, Innovation and Technology.



Source: Kompetenzzentrum Holz GmbH

Lenzing AG pursues in its research the goal of bringing wood into a material use and not to use it as a burning material. This means that wood should only be burned if it has previously passed through other uses. Wood is made up of 40% cellulose and 60% of lignin and other substances. The aim is to bring these 60% into a material use. In the field of biorefinery, the recyclable materials are extracted from subsidiary flows and vest streams.

Web: <http://www.wood-kplus.at/en>

## 4.2 Upper Austrian Food Cluster



The Upper Austrian Food Cluster (LC OÖ) was founded in the year 2000. The Institute for Economic Development (WIFI) and the Upper Austrian Chamber of Commerce decided to establish a cluster in the food sector. The Food Cluster is one of a total of 9 clusters in Upper Austria. It's the largest and oldest food industry network in Austria which links the key players of the Upper Austrian food industry. Background of the food cluster is the fact that the food industry and the agricultural sector play an important role in the Upper Austrian economy. The R & D sector is less developed.

The Upper Austrian Food Cluster is a joint project of the Upper Austria Economic Chamber and the regional government of Upper Austria (Department of Economics and Department of Agriculture). The food cluster has established itself as a cross-industry interface and point of contact for the food industry. The main target groups of the food cluster are food processing commercial and industrial enterprises. The food cluster performs a bridging function between the food industry and the agricultural sector. The partners of the Upper Austrian Food Cluster reflect the heterogeneity of the industry – from agricultural sector to the food production industry, trade and gastronomy, packaging manufacturers and a research and educational institutions.

The food industry is an important factor in the Upper Austrian economy. It's the fourth-largest industrial sector in Upper Austria.

Key figures of the Upper Austrian Food Cluster:

- |                                     |               |
|-------------------------------------|---------------|
| • LC OÖ partners                    | 250           |
| • Total number of employees approx. | 22.741        |
| • Total turnover approx.            | 2.016.142.000 |
| • Farmers involved in projects      | 1.193         |

LC partners according to the number of employees:

- |                     |             |
|---------------------|-------------|
| • Employees >250:   | 13 (5.2%)   |
| • Employees 250>50: | 44 (17.6%)  |
| • Employees <50:    | 189 (75.6%) |

573 LC events with 13.374 participants

98 LC projects with 407 associated partners

Objectives of the Food Cluster are:

- Increasing the competitive position of the Upper Austrian Food Cluster partners

- Strengthening the economic power of Upper Austria
- Intensification of relations within the food industry
- Projects on the topics of technology, qualification and organisation

The Upper Austrian Food Cluster does not conduct its own research – the team comprises 5 employees.

The food cluster is linked to the education sector. Important educational institutions are:

- Higher technical college (HTL) for food technology, cereal and biotechnology in Wels, including a master school for millers, bakers and confectioners
- University of Applied Sciences Upper Austria, Campus Wels: Bachelor and Master's degree in food technology and nutrition. The food cluster has struggled for a long time (about 9 years) for establishing the course in 2013.

The services offered by the Upper Austrian Food Cluster support businesses in promptly implementing the outcomes of research and development with respect to marketable products and in remaining competitive both, on the national as well as international market.

The Upper Austrian Food Cluster offers the following services:

Information:

- Latest news from the food industry
- Organisation of events, business visits, workshops, experience exchange groups
- Presentation of Upper Austrian Food Cluster partners on the internet
- Public relations activities for the Upper Austrian Food Cluster, its partners and the food industry of Upper Austria

Cooperation:

- Initiation, support and promotion of cooperation projects between businesses, research and qualification facilities
- Searching for partners and implementing project ideas
- Developing solutions for project ideas
- Consultation on suitable funding and support facilities

Regionality:

- Increasing the presence of regional products in marketing (OÖ Genussbox)
- Cooperating with OÖ Tourismus and Genussland OÖ (Genussreisen)
- Organisation of product awards with respect to Upper Austrian specialities under the heading of CULINARIX

Internationalisation:



- Analysis of potential export markets
- Information service for export
- Visiting international trade fairs
- Taking part in and initialising international projects

Since 2008, the Upper Austrian Food Cluster (LC OÖ) has assisted the LC research group which pools scientific and technological fields of competence in the area of food and nutritional science. Through this research platform a more frequently collaboration across different disciplines has been achieved. Under the umbrella of the LC research group, a wide range of professional expertise is combined and coordinated by LC OÖ. This enables the network to use the most advanced know-how for innovative solutions of specific problems, benefitting the Upper Austrian food industry.

The Upper Austrian Food Cluster is financed as follows:

- 80% from the economic sector in general: public funds of the regional government of Upper Austria (Department of Economics) and self-financing (60%)
- 20% from the agricultural sector: only public funds from the regional government of Upper Austria (Department of Agriculture)
- The food cluster receives a total of 200,000 euros per year from the regional government of Upper Austria.
- Self-financing is provided through annual financial contributions from LC OÖ partners

Considering these conditions the Upper Austrian Food Cluster is transferable to other regions:

- If there is a certain critical mass of food companies
- If sufficient public funds are provided by the regional government

The transferability also depends on the status of the industry in the region.

In Upper Austria the steel industry, the basic materials industry and the automotive sector have a very strong position. A disadvantage of the food industry is that the entire value chain is not yet represented in the actual political structure: there are still gaps between the agricultural and the economic resort of the regional government. The representation of interests is strictly separated.

An obstacle derives from the significant heterogeneity within the food industry. It comprises companies in the field of milk, bakery, confectionery, meat, etc.

It is a big challenge for the Upper Austrian Food Cluster to convince the companies that all subsectors of the food industry are to be placed together under one umbrella.

Good practice in the field of food research

The „Austrian Competence Center for Feed & Food Quality, Safety and Innovation“ (FFoQSI) is a Competence Center for Excellent Technologies under the national funding programme COMET. In the course of the competence center three universities, the Austrian Institute of Technology, the Austrian Agency for Health and Food Safety and 35 companies form a partnership. The following universities are participating: University of Natural Resources and Life Sciences (Vienna), University of Veterinary Medicine – Institute of Milk Hygiene, Milk Technology and Food Science (Vienna), University of Applied Sciences Upper Austria (Campus Wels).

Outcomes: FFoQSI makes food and food production systems better, safer and more sustainable. FFoQSI develops new approaches based on cutting-edge technologies in the fields of microbiology, physical-chemical analysis and bioanalysis and applies them on critical process steps along major feed and food value chains. In times of profound global changes, FFoQSI helps feed and food business drivers in taking or maintaining innovation lead and constantly enhancing product quality and safety.

The „Austrian Competence Center for Feed & Food Quality, Safety and Innovation“ is funded by the Austrian Research Promotion Agency (FFG) and by the regional governments of Upper Austria, Lower Austria and Vienna.

A significant part of the activities comprise applied research for the market (research projects), a small part includes basic research.

Web:

[https://www.ffg.at/sites/default/files/allgemeine\\_downloads/strukturprogramme/comet\\_k1\\_call4\\_factsheet\\_ffoqsi\\_en\\_final.pdf](https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/comet_k1_call4_factsheet_ffoqsi_en_final.pdf)

Weblink Upper Austrian Food Cluster: <https://www.lebensmittelcluster.at/en/>

## 5. Needs, Gaps and Bottlenecks to Deploy the Bioeconomy

This chapter describes the main needs of the area to further deploy the bioeconomy in the near future, as perceived by the regional stakeholders and in the revised documents. In particular, the gaps and bottlenecks that hamper the development of research and innovation for specific bioeconomy-related business areas are described.

On the one hand the individual areas of the biobased industry are perceived as important and future-proof industries in Austria. On the other hand the biobased industry in its entirety is little present in Austria.

The Food/Nutrition field of activity can build on specialised companies in Upper Austria. All the relevant industry sectors have a strong presence in Upper Austria where they are growing faster than in the country as a whole. However, there is virtually **no research in the core area of food production**.

As a consequence, a broad-based strategy should be followed in the field to raise awareness of the need for joint development and innovation policy measures focused on SMEs. The group of high-potential, innovative regional companies in the food industry should be linked to the appropriate players in the research sector. Since regional competences in the area of nutritional research are only in the development phase, **complementary capabilities are to be integrated through trans-regional research cooperation**. (Innovative Upper Austria 2020)

In the Energy field of activity, the relevant industry sectors are for the most part enjoying a positive trend and attaining surpluses in international trade. There is sufficient entrepreneurial strength for further development in this field of activity. However, the **density of research in companies and non-university institutes is considerably lower than in the area of Industrial Production Processes or Mobility/Logistics**. The elements of a front-runner strategy will therefore be characterised by elements of stakeholder networking and focusing on key joint projects. By joining forces, international visibility will be heightened. (Innovative Upper Austria 2020)

In order to enable the bioeconomic sector to produce competitive products in large-scale, **more investments in research infrastructure are essential prerequisites**, e.g. pilot plants. In the Upper Austrian food sector there are little research resources available. The **companies are not able to compete with the research departments of large corporations** such as Nestle and Danone. Due to concentration tendencies in the trade sector, the profit margins for the enterprises are very low. This leaves **little resources for research**. The focus is on the day-to-day business with its permanent predatory competition. Investing in research is associated with a certain risk for companies – it is not certain that the new product will compete successful in the

market. The Upper Austrian food cluster, for example, supports companies to create research infrastructure and to draw up a strategy that will be successful on the market.

From the economics point of view, **electricity prices are too low to encourage investments in bioenergy**. The competition with conventional energy sources is intense.

Another obstacle derives from the lack of appropriate staff. Starting at school young people should be introduced to technical issues. The Johannes Kepler University at Linz (JKU) does not have bioeconomy in its profile, currently the focus is on medicine, polymer engineering technologies and mechatronics. The status of a complete university could be achieved by strengthening bioeconomy. The field of bioeconomy could be installed in the chemical institutes: e.g. materials, composite materials.

Obstacles deriving from EU-Funding:

The European Commission should simplify the requirements for its funding programs. **H2020 requires very large consortia with 15 to 20 international participants. This is associated with an enormous organizational effort.** Both the application process and the implementation of the project require considerable efforts, e.g. search for project partners, consultation and agreement with partners, setup of the project structure. In addition, the partners do not know each other, which results in a **low level of trust**. Smaller consortia would be very helpful. In Austrian funding programmes the handling of cooperation projects is much easier. The partners know each other and are reliable (universities, enterprises, research centers, etc.)

Future trends in the field of bioeconomy:

In the food sector, nutrition physiology<sup>1</sup>, individual nutrition and lifestyle disease will become important issues in Europe. Know-how is required, networking of the food industry with other sectors will become more important, e.g. with the agricultural sector and the processing industry.

The subject of nutrition is an issue in the EU: e.g. Civilization diseases, nutritional physiology, individual nutrition will be a big issue, know-how is required, networking the food industry with other industries will become more important.

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<sup>1</sup> Nutrition physiology deals with different types of food and their effects on the metabolism. One topic of nutrition physiology is vitamin loss of frozen foods. Another topic is the calculation of required calories per day and what sort of food should best be avoided for a healthy lifestyle

In the bioenergy sector, the decentralization of energy production is a future issue: e.g. Fronius conducts research in the field of alternative energy sources (e.g. solar energy) in cooperation with car manufacturer Tesla.

In the production of composites, increasingly renewable raw materials are used as a substitute for traditional materials.

The RTI strategy for the Austrian bioeconomic industry (“FTI-Strategie für die biobasierte Industrie in Österreich”) points out future development opportunities and recommendations for the expansion of the bio-based industry in Austria ([http://www.oegut.at/downloads/pdf/fti-strategie\\_biobasierte-industrie\\_2014.pdf](http://www.oegut.at/downloads/pdf/fti-strategie_biobasierte-industrie_2014.pdf)):

- Ensure full utilisation of biomass – material and energetic use (cascading usage)
- Biorefineries are best-practice examples for the use of biomass
- Integrated production processes where areas of application and sales markets are developed for each product and by-product
- More cross-linking of the individual industrial sectors in order to use existing know-how across all sectors and to use previously unused synergies
- Interlink stakeholders from industry, administration and research and actors in the value-added chain vertically and horizontally. In the meanwhile the coordination platform “Bioeconomy Austria” has been founded (<http://www.bioeconomy-austria.at/en/>).
- Research funding for demonstration and pilot plants, investment grants for implementations and provision of risk capital

## 6. Information Sources

### Literature and Documents:

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Austrian Energy Agency, 2015. Aktionsplan zur stofflichen Nutzung nachwachsender Rohstoffe – Auf dem Weg zur ressourcenschonenden und biobasierten Wirtschaft. On behalf of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management.

### Relevant websites:

<http://www.ooe2020.at/> (strategic economic and research programme „Innovative Upper Austria 2020“)

[http://www.oegut.at/downloads/pdf/fti-strategie\\_biobasierte-industrie\\_2014.pdf](http://www.oegut.at/downloads/pdf/fti-strategie_biobasierte-industrie_2014.pdf) (RTI strategy for the Austrian bioeconomic industry)

<http://www.biz-up.at/en> (Business Upper Austria, the business agency of the regional government of Upper Austria)

<http://www.uar.at/en/home> (Upper Austrian Research GmbH)

<http://www.bioeconomy-austria.at/en/> (Coordination platform Bioeconomy Austria)

<http://www.wood-kplus.at/en> (Kompetenzzentrum Holz GmbH – Wood K plus)

<https://www.lebensmittelcluster.at/en/> (Upper Austrian Food Cluster)

<http://www.jku.at> (Johannes Kepler University – JKU).

[www.fh-ooe.at](http://www.fh-ooe.at) (University of Applied Sciences Upper Austria)

<https://www.ffg.at/en/comet-competence-centers-excellent-technologies> (national funding programme COMET – Competence Centers for Excellent Technologies)

<https://www.ffg.at/oberoesterreich> (Upper Austrian research funding in Cooperation with the Austrian Research Promotion Agency – FFG)

<https://www.land-oberoesterreich.gv.at/136167.htm> (overview of the Upper Austrian research funding programs)

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