

STRATEGIC ECONOMIC AND RESEARCH PROGRAMME

**INNOVATIVE
UPPER AUSTRIA** 
RESEARCH.BUSINESS.FUTURE

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Index

1. Foreword	4
2. Initial Strategic Situation	6
2.1. Introduction	6
2.2. Macroeconomic performance	7
2.3. Innovation and research	8
3. Previous Strategic Programmes in Upper Austria 1998 – 2013	10
4. “Innovative Upper Austria 2020” Upper Austria’s Strategic Economic and Research Programme for 2014 to 2020	12
4.1. Introduction	14
4.2. Core strategies	14
4.3. Fields of activity – objectives, topics and measures	16
4.3.1. Industrial production processes	16
4.3.2. Energy	20
4.3.3. Health Ageing Society	22
4.3.4. Food Nutrition	24
4.3.5. Mobility Logistics	26
4.4. Comprehensive topics along the Innovation Chain	28
4.4.1. Comprehensive topics: Education	28
4.4.2. Comprehensive topics: Research	29
4.4.3. Comprehensive topics: Economy	30
5. Organisational implementation/ongoing processes	32
5.1. Roles and responsibilities during programme implementation	32
5.2. Financial volume of the programme	33
5.3. Interim evaluation 2016	33
5.4. Indicators	33
5.5. Annual control and steering cycle at programme and policy levels	34
5.6. Project submissions	34
6. Corresponding programmes in Upper Austria	36
6.1. Introduction	36
6.2. “Arbeitsplatz Oberösterreich 2020”	36
6.3. Education	36
6.4. “Oö. Gesamtverkehrskonzept 2008”	37
6.5. “Energiezukunft 2030”	37
6.6. “Kursbuch Tourismus Oberösterreich 2011 – 2016”	37
7. Outlook	38
List of Figures	40
List of abbreviations	41
Bibliography	41

1. FOREWORD

Global competition presents a challenge that individual regions have to meet. Research and innovation form the pillars of a powerful and competitive Upper Austrian economy. Therefore, we must strengthen innovative power in a targeted manner in order to develop the region's economic competitiveness and enable the growth needed to provide jobs and prosperity.

Strategic programmes are a proven means of effectively supporting the sustainability of Upper Austria, increasing the value created in the region and ensuring social security. Following three strategic programmes for Upper Austria in the period from 1998 to 2013, a new 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. This programme follows the modern 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, namely Industrial Production Processes, Energy, Health | Ageing Society, Food | Nutrition and Mobility | Logistics, enable Smart Specialisation and also provide the necessary leeway for the seven-year strategy.

It is important for us that policies developed in the fields of education and research are consistent with their applicability in business, and that economic requirements are taken into account in the priorities of education and research. By combining forces in the areas of education – research – economy, we will develop a strategic competitive advantage for our region that differentiates us from other regions.

For the first time, we issued a call for expression of interests to identify topics and activities – more than 550 responses demonstrate just how creative and forward-looking the Upper Austrian innovation community is. The Institute of Economic Research (WIFO) also confirmed in an ex-ante evaluation of this strategic programme that Upper Austria is focusing on the correct fields of activity and implementing the principles of Smart Specialisation Strategies.

We would like to express our sincere gratitude to all the contributors who have shared their knowledge and expertise in the preparation process. With great expectations we now proceed to the implementation phase, and through “Innovative Upper Austria 2020” we intend to promote competitiveness, growth and investment as a basis for prosperity, security and quality of life, and thus set a vital course for the future viability of our region.



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Fields of activity were selected based on technological core competencies with critical mass in Upper Austria and the competitiveness and innovativeness of regional companies in industrial sectors related to the fields of activity.

The accompanying 2013 ex-ante evaluation by the Austrian Institute of Economic Research confirmed the definition of five fields of activity to constitute a holistic and integrated policy approach and to follow Smart Specialisation principles:

The respective objectives, topics and measures within the fields of activity adhere to the **education–research–economy innovation chain**.

For the first time, the programme “Innovative Upper Austria 2020” also coincides with programmatic requirements at EU level (Horizon 2020 and Common Strategic Framework (CSF) funds (such as ERDF)). This offers significant benefits while implementing the regional programme; however, it will now run for a period of seven years, as opposed to the previous four-year strategic programmes. It is therefore necessary to develop a flexible programme framework, which will be subjected to an interim evaluation planned for 2016.

The state of Upper Austria aims to maintain and strengthen the participation of Upper Austrian actors in central funding programmes at national and international level (e.g. Competence Centers for Excellent Technologies (COMET), the Christian Doppler Laboratories, Special Research Programs of the Austrian Science Fund and the instruments of Horizon 2020 at the European level). In addition to the continuation of the counselling programme for these funding instruments, incentive systems for participation are to be created in the future.

-  Industrial Production Processes
-  Energy
-  Health | Ageing Society
-  Food | Nutrition
-  Mobility | Logistics

2. INITIAL STRATEGIC SITUATION

2.1. INTRODUCTION

Upper Austria has a long tradition of creating innovative strategic programmes (“Upper Austria 2000 +”, “Innovative Upper Austria 2010” and “Innovative Upper Austria 2010plus”). The characteristics and peculiarities of the regional economy always build the foundations for the development of the region’s economic and research programmes. Strategic goals must begin from this point and identify viable paths for further development.

These considerations also form the basis of the new programme “**Innovative Upper Austria 2020**”. Following the motto of the Upper Austria Council for Research and Technology (RFT OÖ) “Strengthen strengths – dare something new”, the strategic objectives, topics and activities build on existing structures and “critical mass” of the regional economy and thus carry on the tradition of strategic programmes in Upper Austria.

A **new practice** has been adopted through the modern approach in technology policy of consistent vertical orientation along the **education–research–economy innovation chain** within defined **fields of activity**.

2.2. MACROECONOMIC PERFORMANCE

Overall, macroeconomic indicators suggest that Upper Austria’s competitiveness remains intact. As Austria’s leading industrial and export state, Upper Austria has for years demonstrated excellent results in terms of economic and employment data: low unemployment and high labour force participation rate, the highest export rates (especially in manufacturing of material goods) and a high proportion of innovative SMEs.¹

However, the current competitive position is by no means automatically guaranteed for the future. “Neighbouring regions with significant cost advantages and an orientation towards material goods manufacturing are in the process of catching up, along with the market entry of large emerging countries such as China, India, and Brazil, but also increasingly favourable technological and institutional conditions for regional optimisation of the production network for local companies, necessitate further efforts to strengthen regional conditions and the sustainable competitiveness of the region’s economy”.² Consequently, continuous further development of the efficiency of regional production is necessary in the sense of a “**productivity-oriented growth strategy**” in order to secure the status quo regarding the international division of labour and high income.

Highly specialised international industry must strengthen overall economic productivity through technology-based organisational improvements while at the same time ensuring that industrial products contain an increasing degree of service components.

2.3. INNOVATION AND RESEARCH

Upper Austria leads the way in applied research, especially with regard to its enterprise sector. Accordingly, almost 80% of regional R&D expenditure in 2010 came from firms.³ With over 740 registered inventions at the Austrian Patent Office in 2012, Upper Austria submitted nearly a third of all the Austrian applications and thus had more patents than any other state.

Cross-industry networks and cluster structures are well developed and facilitate the attainment of critical mass and economies of scale. As a consequence, compared to other federal states, especially among SMEs the readiness to cooperate regionally is exceptionally high.

Nonetheless, by taking a closer look at the innovation system, improvement potential can be identified, particularly in the areas of R&D financing and human resources.

Measured in terms of registrations at the European Patent Office, with 204 registrations per million inhabitants, Upper Austria is ranked 21st among the 97 highly developed material goods-oriented regions evaluated. This ranking is augmented by exceptional integration in transregional activities owing to numerous international patent cooperations, although by comparison patent activities in the high-tech sector and in key technologies are relatively limited. In Upper Austria, applied research for incremental innovation is still the primary focus.⁴

With an R&D ratio of 2.7% (estimated for 2011), Upper Austria remains below the Austrian average of 2.8%, but with clear indications of gaining ground. As mentioned above, the nucleus of applied research activities is formed by the innovation-oriented corporate sector and in particular by medium-sized companies carrying out research. The public sector only contributes one-fifth of R&D financing (compared to 35.6% in Austria).

In spite of improvements in recent years, deficits continue in the area of human resources, especially with regard to persons with tertiary education, the international attractiveness and openness of the educational sector, and the percentage of women in technical fields.⁵

The share universities in Upper Austria are contributing to overall research and development expenditure in the region is comparatively low. In general terms, the small scale of the university sector is an international disadvantage. Additionally, owing to the scale and structure of its human resources, Upper Austria is at present not particularly attractive as a location for international research centres.⁶ This problem is further exacerbated by the thematic orientation of the regional (tertiary) education system, which only partly corresponds with the region's economic structure.

In combination, all these factors currently place Upper Austria in the position of a "smart follower". By contrast, "a front-runner strategy" must place a greater emphasis on radical innovations and pursue the goal of pushing researching companies to stretching their technological limits, thereby strengthening Upper Austria as a technology exporter. However, such a strategy can only be realised through a tangible increase in R&D investment (primarily public).⁷ At the same time, innovation orientation must be strengthened, especially among smaller companies in specific niches, and must take service innovations into account. In this regard, the programme "Innovative Upper Austria 2020" described here should serve as a driving force in the coming seven years.

³ cf. Joanneum Research, 2013, 5
⁴ cf. WIFO, ex-ante evaluation 2013, 10
⁵ cf. Joanneum Research, 2013, 2f
⁶ cf. WIFO, ex-ante evaluation 2013, 10
⁷ cf. WIFO, ex-ante evaluation 2013, 12

3. PREVIOUS STRATEGIC PROGRAMMES IN UPPER AUSTRIA 1998 – 2013

WHAT HAS HAPPENED TO DATE – STRATEGIC PROGRAMMES IN UPPER AUSTRIA

The development of the new "Innovative Upper Austria 2020" Strategic Economic and Research Programme can rely upon the extensive experience gathered from its predecessors, as the latest programme is already the fourth of its type.

Undoubtedly, the first Strategic Programme ("Upper Austria 2000+"; 1998 – 2003) represented a response to the crisis in the state-owned industries in the 1980s, which necessitated a reorientation of the economic basis and thus the reprioritisation of public funding for business and innovation. The process began with a major study of Upper Austria's industrial strengths and the foundation of the Technologie- und Marketinggesellschaft (TMG) as the central regional economic agency by the Upper Austrian government. In 1997, this agency was commissioned with the task of drawing up and subsequently implementing the "Upper Austria 2000+" Strategic Programme. The financial basis was provided by a "Future Fund", which was created from the returns from privatisation as well as grants from the federal government and the EU Structural Fund. Driven primarily by regional politics, social partners and industry, a total of twelve strategies with 33 measures were prepared in working groups for the topics of "Technology", "Professional Qualifications" and "Location Marketing". This framework has continued to influence many aspects (above all institutional) of the regional innovation system to the present day. From a content perspective, the emphasis of the programme lay on the traditional strengths of the Upper Austrian economy, although an extensive cluster policy covering numerous industries and the creation of Competence Centres, as well as Technology and Impulse Centres for technology transfer on a local level provided powerful incentives for diversification. Network cooperation and the strengthening of the companies' innovation capacity were also intended to stimulate the systematic enhancement of regional strengths.

A comprehensive evaluation of both TMG and the Strategic Programme at the end of its planned duration (2004) provided a positive assessment of many of the elements of "Upper Austria 2000+" (above all cluster policy, Competence Centres, UAR, CATT Innovation Management, Technology and Impulse Centres) and recommended their continuation. As a result they were retained in the subsequent "Innovative Upper Austria 2010" programme (2005 – 2010). However, the foundations for this programme were prepared in a far more participative process in which 250 experts drew up 18 strategies and 43 measures, which were assigned to five target topics: "Research and Development", "Professional Qualifications", "Clusters and Networks", "The Upper Austrian Economic and Technology Region" and "EU Networks". A priority was the "Research and Development" topic, where the key sectors of mechatronics, ICT, life sciences, new materials and logistics were clearly identified. The support of R&D partnerships, particularly between universities, business and industry, as well as the development of human resources and professional training, all represented major points of increased emphasis.

The subsequent "Innovative Upper Austria 2010plus" programme, which ran until the end of 2013, was largely designed as a follow-up to its predecessor and its structure was therefore very similar to that of "Innovative Upper Austria 2010". On the basis of guidelines prepared by the RFT OÖ and the involvement of experts, 14 strategies and 37 measures were established along with 120 projects in the five (largely unchanged) thematic areas of "Research and Development", "Education and Careers", "Networks", "The Upper Austrian Economic and Technology Region" and "EU Networking". The thematic emphasis was again on the topic of "Research and Development" (with more than 60% of the budget), focused on the research priorities mechatronics, ICT, life sciences, lightweight construction/innovative materials, logistics and (new) renewable energies.



4. "INNOVATIVE UPPER AUSTRIA 2020"

UPPER AUSTRIA'S STRATEGIC ECONOMIC AND RESEARCH PROGRAMME FOR 2014 TO 2020

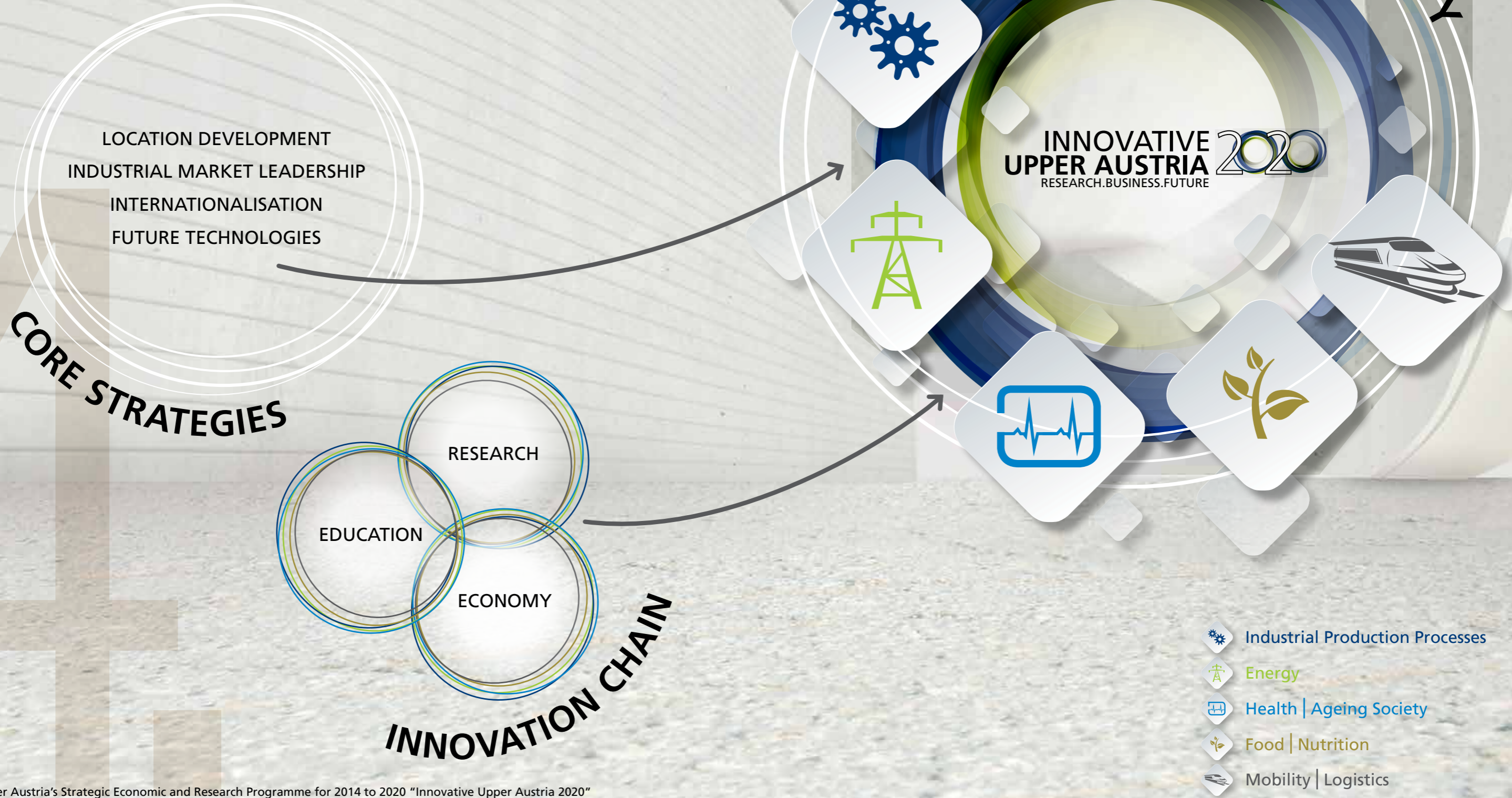


Fig. 1: Upper Austria's Strategic Economic and Research Programme for 2014 to 2020 "Innovative Upper Austria 2020"

4.1. INTRODUCTION

The new programme "Innovative Upper Austria 2020" is fundamentally rooted in the traditions of its predecessors, in large part because the institutions and structures created through these programmes continue to exist and exert an influence on the system. But first and foremost, the majority of innovation policy measures require continuity in order to be effective in the long term.

Nevertheless, a **new** aspect is the adoption of a modern approach in technology policy in the form of systematic vertical orientation of the programme along the **Education-Research-Economy Innovation Chain** within defined **fields of activity**.

Four fully formulated core strategies (**Location Development, Industrial Market Leadership, Internationalisation and Future Technologies**) form the basis of the programme. These are derived from strategies at EU level, the stipulations of the Austrian Council for Research and Technological Development, and the strategic recommendations of the Upper Austria Council for Research and Technology (RFT OÖ).

The strategies are focused on improving Upper Austria's competitive position in line with a "productivity-oriented growth strategy".

In line with impact-oriented public administration, the effects of the topics and measures included in the new Strategic Programme will be assessed annually and changes pursued during the entire programme period on the basis of a tailor-made set of economic and innovation policy key indicators.

4.2. CORE STRATEGIES

LOCATION DEVELOPMENT

- To attract **the best scientific and business minds**, Upper Austria must further develop as a region and improve its competitive advantages.
- A strong economic agency contributes to the creation and security of jobs and the improvement of prosperity and social security in Upper Austria.
- Upper Austria is committed to **strengthen science and research** as a basis for future economic development.

INDUSTRIAL MARKET LEADERSHIP

- Sustainable jobs can only be created if **knowledge** is converted into marketable **products and services**. Research and development in Upper Austria should therefore be promoted primarily in areas in which Upper Austrian companies excel.
- **Knowledge-based business models** and an export-oriented **industrial sector** are particularly important to Upper Austria. Accordingly, in order to be competitive in the long-term, Upper Austria must invest in the development of more efficient, **adaptable production systems of the future in combination with new knowledge-based services**.
- Global societal challenges form the framework for the identification of **niches**, in which long-term **technological leadership** must be pursued.
- A critical factor in achieving competitive advantage is the **speed** of the diffusion of new technology and their application in novel processes and products. Measures to accelerate this process should thus be adapted to the latest developments. The entire innovation chain must then be considered a priority. Proven approaches include innovative models of technology transfer and further development of clusters, as well as intelligent funding of projects and regional structures. New approaches must be worked out to solve the greatest societal challenges in the context of open innovation and the increasing significance of creative communities.

INTERNATIONALISATION

- The **international orientation** of the **education, research and business sectors** must be **strengthened** and the recognition of Upper Austria as a business and research region improved. Through international cooperation with other regions, long-term strategic alliances are to be formed.
- **The activities of local companies with regard to internationalisation are to be supported**. At the same time the attraction of both **excellent international researchers** and high-profile global companies and the establishment of research headquarters of international corporations in Upper Austria must be promoted.

FUTURE AND EMERGING TECHNOLOGIES

- Preconditions (e.g. based on strategic intelligence) must be established, in order to **recognise** global **future trends** and accommodate them using new technologies and strategies.
- Furthermore, awareness of the importance of research and development in society must be strengthened through a sustainable improvement in the image of engineers and researchers in order to counteract scepticism towards technology. **Entrepreneurial and research spirit** should be encouraged in secondary and tertiary education.



4.3. FIELDS OF ACTIVITY – OBJECTIVES, TOPICS AND MEASURES

4.3.1. Industrial production processes

The key to securing the region's current international position and high earnings lies primarily in the continuous further development of regional production. Overall economic productivity can be increased through technological and organisational improvements in industrial manufacturing processes. In particular, offering industrial services along with products and process technology should be given special attention.

The field of activity "Industrial Production Processes" is clearly represented by strong and dynamic companies, and is therefore especially favourable for the pursuit of a "front-runner strategy".

Almost without exception, the industry sectors relevant to this focal point achieve foreign trade surpluses and, through their production and research orientation, a majority also demonstrate regional specialisation as well as a head start in growth compared to the rest of Austrian industry.

Some key fields such as mechatronics, process automation, materials and ICT were already identified as clear focal points in the previous Strategic Programme. The challenge now is to combine these sectoral strengths and to develop excellence and critical mass. Supporting and building up research is of special significance in order to launch a greater number of radical innovations.⁸

STRATEGIC OBJECTIVES

- 1a In 2020, Upper Austria is to be a leading European industrial region, withstanding the pressure of globalisation through competitive products and services.
- 1b Technological leadership and systematic increases in productivity and flexibility in the area of industrial production processes and procedures are critically important. In this way, innovative, sustainable production methods will be implemented to facilitate the greatest possible energy and resource efficiency (circular economy/material flows).
- 1c A high degree of wealth creation and thus employment will be secured through technically advanced, adaptive, high-quality production processes.

TOPICS/MEASURES

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

EDUCATIONAL POLICY OBJECTIVES

- 2a In the Upper Austria of 2020, children and young people will, from a very early age, obtain initial, concrete experiences with key technologies of the future and their everyday application. Through play, they will learn to deal with the latest technologies, think in interdisciplinary

terms and develop an interest in technical problems.

- 2b New, internationally oriented courses of study as well as basic and continuing education will build on this interest and offer an opportunity for the completion of internships in Austria and abroad.
- 2c By 2020, Upper Austria will have increased the number of technical experts, with a significant rise in the percentage of women.
- 2d The further development of dual education, secondary technical colleges (HTLs), universities of applied sciences (FHs) and the Johannes Kepler University Linz (JKU) (technical/natural sciences faculty), as well as further training measures for employees in manufacturing industries (life-long learning) will contribute to long-term coverage of the demand for qualified personnel.

TOPICS/MEASURES

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

A number of additional initiatives regarding skilled personnel are contained in the "Arbeitsplatz Oberösterreich 2020" ("Workplace Upper Austria 2020") strategy.

RESEARCH POLICY OBJECTIVES

- 3a Research and production are interrelated. By 2020, Upper Austria will have further developed research across the board in sectors relevant to production and related Key Enabling Technologies (ICT, materials, mechatronics, etc.).
- 3b Upper Austrian research capabilities will have been enhanced to form an internationally visible "Production of the Future" research and transfer network.
- 3c The Upper Austria of 2020 will be a leading region for "interdisciplinary manufacturing research", with successful participation in national and European research programmes and initiatives relating to the field of production processes.

TOPICS/MEASURES

The central research topics in the "Industrial Production Processes" field of activity are information and communication technologies (ICT), materials and lightweight construction, process and product development. Within the scope of these research areas, the following topics and measures have been defined as focal points:

- Mathematical modelling
- Software
- Security of production processes, networks and data
- Hardware
- Surfaces
- Manufacturing processes
- Material and component testing
- Material development
- Process technologies
- Process engineering and optimisation
- Energy and resource efficiency

⁸ cf. WIFO, ex-ante evaluation, 2013, 138ff

ECONOMIC POLICY OBJECTIVES

- 4a In 2020, Upper Austria will enjoy attractive conditions for manufacturing companies and will actively support the further development of existing companies and the attraction of new firms through a range of initiatives.
- 4b A balanced ratio of research headquarters, SMEs in specific niches, and leading companies that create an above-average percentage of jobs and contribute significantly to economic and research performance, will secure essential long-term stability.
- 4c Industrial services will be part of the further development of production technologies and will make a major contribution to increased competitiveness.
- 4d Risk capital and professional support will be available for start-ups and spin-offs and will aid their sustained development.
- 4e Industrial value chains will have been strengthened through the regional and international production networks of local companies. The further development of cluster initiatives will strengthen Upper Austria's international positioning as a production region.
- 4f By 2020, Upper Austria will be attractive to international specialists and talent, top managers and distinguished research groups.

TOPICS/MEASURES

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



4.3.2. Energy

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. We can assume that 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 in the core areas of 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. The topic of storage technology offers major opportunities to build up transregional excellence.⁹

STRATEGIC OBJECTIVES

- 1a** As of 2020, Upper Austria's regional advantage will lie in an excellent infrastructure based on energy services, resulting in secure, high-quality supply at competitive prices.
- 1b** By 2020, Upper Austria will have developed its energy infrastructure and research to allow more system flexibility, and will have adjusted to steadily growing demand, especially regarding the integration of renewable energy sources.
- 1c** Upper Austria will have strengthened regional production and research through the development of technologies, products and services that contribute to the efficiency of all energy sources and facilitate the use of production processes that, in international comparison, are especially energy-efficient.

EDUCATIONAL POLICY OBJECTIVES

- 2a** In all areas of basic and continuing education (lifelong learning), the topic of "energy and resource protection" will be more firmly anchored in people's consciousness.
- 2b** Through the strengthening of all basic and continuing education in the natural sciences and the development of new university course programmes, Upper Austria will ensure the next generation of interdisciplinary technical experts and specialists, particularly in the energy field.

TOPICS/MEASURES

- Cross-industry intensification of knowledge regarding energy-efficient buildings and building technology
- Supplementary professional qualifications in domestic technology for increased energy efficiency
- Intensification of energy training at secondary technical colleges (HTLs)
- Support for young energy researchers
- Focused development (JKU/FH) through new course programmes in the fields of energy- and resource-efficient construction and building sciences, energy efficiency, power electronics, construction and electrical technology.

RESEARCH POLICY OBJECTIVES

- 3a** In 2020, Upper Austria will possess recognised research competences at universities, non-university research institutes and companies in the fields of energy conversion, supply and utilisation.
- 3b** The most relevant research topics are the resource-efficient production and the secured, economic provision of energy of suitable quality, as well as the topic of energy storage.
- 3c** By 2020, knowledge transfer and the concentration of competences and structures in energy research will have led to increased international visibility and interconnectedness.

TOPICS/MEASURES

The central research topics in the "Energy" field of activity are Industrial Production Processes, systems technology, controls and simulation, and renewable energies. Within these research areas, the following topics and measures will be defined as focal points:

- Energy efficiency in production
- Decentralised/customer-oriented systems
- Load management/monitoring
- Renewable energies/residual flows/biogenic processes
- Building and construction technology

ECONOMIC POLICY OBJECTIVES

- 4a** Stimulating research and supporting the market diffusion of new technologies will contribute to acceleration in innovation processes and thus secure the competitiveness of Upper Austria as a manufacturing region.
- 4b** The further development of framework conditions, grants and financing instruments, and rapid approval processes will create incentives for company research and new investments. This will support companies opening new markets or expanding those that already exist.
- 4c** Regional energy policy stakeholders will join forces to allow the optimum design of relevant framework conditions on a national and European level.
- 4d** Exports of Upper Austrian energy and environmental technologies, as well as the share of holistic energy services, will be increased.

TOPICS/MEASURES

- Promotion of renewable energies and energy efficiency in SMEs through suitable programmes
- Further development, joining and alignment of the activities in clusters relevant to the objectives in the field of activity
- Development of business region/attraction of companies
- Enhancement of innovation competence and the internationalisation of companies, especially SMEs
- Development of holistic energy services
- Use of economic policy potential in the fields of energy and environmental technologies

⁹ cf. WIFO, ex-ante evaluation, 2013, 140f



4.3.3. Health | Ageing Society

The "Health | Ageing Society" field of activity represents a new programme focus and therefore is still in a very early development phase.

Relative specialisations with high growth potential are evident in areas such as electrotherapeutics and medical equipment. However, the manufacturing and corporate research volumes are relatively modest and there is a lack of leading, internationally established companies.

Strengths in this area must be actively promoted wherever entrepreneurial capabilities can be intelligently combined with excellence in regional research. A few selected pilot projects should be pursued jointly with public sector users in tandem with intensive transregional cooperation, in order to secure the necessary complementary expertise.

The aim must be to use existing strengths in order to create and grow visibility and excellence in the near-term. Activities in this field of activity are to be coordinated with an overall inter-ministerial strategy in the healthcare sector at regional level.¹⁰

STRATEGIC OBJECTIVES

- 1a** In 2020, in Upper Austria the health of its people and their integration in a social environment will be of special significance. Upper Austria will promote the development of new technologies for the increased efficiency and quality of integrated healthcare.
- 1b** In 2020, Upper Austria will be a leading region in the area of "individualised medicine". Upper Austria is committed to prevention and will further the development of personalised technologies, which in particular will enable an increase in the level of employment in an ageing population and will help people to remain active for longer at work, at home and in society.

TOPICS/MEASURES

- Life phase-oriented workplace design and social innovation

EDUCATIONAL POLICY OBJECTIVES

- 2a** As a result of age-independent and age-appropriate educational processes, in 2020 Upper Austria will facilitate increased participation in work-related basic and continuing education measures in line with the lifelong learning principle.
- 2b** By 2020, Upper Austria will have implemented measures for the expansion and closer networking of secondary and tertiary education, and will have created coherent educational programmes in the health and medical sectors and related technology-centred training.

TOPICS/MEASURES

- Training opportunities for technology-aided services (e-health)
- Measures to increase awareness regarding healthy lifestyles, as well as special educational offers for particular groups of people
- Implementation of a human medicine university course programme

RESEARCH POLICY OBJECTIVES

- 3a** By 2020, Upper Austria will have thematically structured and networked its existing research competences and will have developed into a high-quality, internationally-oriented research and transfer centre for medical technologies with the appropriate infrastructure. This will be achieved through intensive teamwork between universities and HTLs, non-university research institutes, clinical partners and companies in Upper Austria, as well as through strong national and international partnerships.
- 3b** Upper Austria will promote the interdisciplinary research and development of innovative solutions for products, equipment, systems and services targeted in particular at older people, in order to support them in an active and independent lifestyle.

TOPICS/MEASURES

Central research topics in the Health | Ageing Society field of activity are medical computing, medical technology, mechatronics and materials. The following topics and measures have been defined as focal points within these research areas:

- Information systems
- Software
- Modification/development of medical equipment and materials
- Telemetrics/monitoring
- Personalised diagnostics/prevention/therapy

ECONOMIC POLICY OBJECTIVES

- 4a** Upper Austria will pursue the rapid transfer of newly created technologies from research to market application. This will involve dealing with regional framework conditions, developing suitable and comprehensive funding programmes with strong leverage effects, and promoting entrepreneurship and creation of new ventures (spin-offs and start-ups).
- 4b** Upper Austria will support close-to-market research and development in partnership with companies as a means of furthering their international connectedness. The expansion of existing leading companies, SMEs and small companies in specific niches will be supported, and new leading companies and potential research headquarters will be attracted to the region.

TOPICS/MEASURES

- Intensification of the cooperation between research and industry, as well as the further development, joining and alignment of activities of clusters and networks relevant to objectives in the "Health | Ageing Society" field of activity
- Development of business region/attraction of companies
- Increasing the innovation competence and internationalisation of companies, especially SMEs
- Support for company founders and young entrepreneurs
- Promotion of knowledge-intensive services for healthcare
- Support for leading companies, headquarters and SMEs in specific niches with high growth potential through specific offers in cooperation with partners in the innovation system

¹⁰ cf WIFO, ex-ante evaluation, 2013, 141f



4.3.4. Food | Nutrition

The "Food | Nutrition" field of activity can also build on specialised companies in the region. All the relevant industry sectors have a strong presence in Upper Austria where they are – at the very least – 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.¹¹

STRATEGIC OBJECTIVES

1a In 2020, Upper Austria will be a leading European region for the development, sustainable production and marketing of high-quality foods to meet various individual's needs, and will in particular consider the up- and downstream processes of the value chain.

TOPICS/MEASURES

- Food production region 2050

EDUCATIONAL POLICY OBJECTIVES

2a By 2020, Upper Austria will have implemented measures to further understand the relationships between nutrition, health and human performance, and will have increased the general public's appreciation and trust of modern food production.

2b Upper Austria will offer cross-industry, interdisciplinary, coordinated educational programmes.

2c Young people will find employment in the food processing sector attractive and desirable and the field will offer the appropriate prospects for the future.

TOPICS/MEASURES

- Strengthening the new University of Applied Sciences (FH) course programme in food technology and nutrition
- Basic and continuing education regarding strategies to further process regional foodstuffs and improve material cycles

RESEARCH POLICY OBJECTIVES

3a By 2020, Upper Austria will have systematically developed and expanded the appropriate internationally visible research competence in the specific areas of food processing and nutrition research, and will have established interdisciplinary networks through suitable national and international cooperation.

3b Upper Austria's future potential lies in joining research topics in the Food | Nutrition field with relevant Key Enabling Technologies.

TOPICS/MEASURES

Central research areas in the Food | Nutrition field of activity are production processes, materials, quality assurance and analytics. The following topics and measures have been defined as focal points within these research areas:

- Food ingredients/modification
- Materials in the food industry
- Food quality, quality assurance (food controls), measurement procedures, analytics
- Production technologies

ECONOMIC POLICY OBJECTIVES

4a In the Upper Austria of 2020, results of research in the Food | Nutrition field will be transferred to companies quickly via short channels. Clusters and the networking of stakeholders from education, research, business and industry in a competence centre will play an important role in this.

4b The securing and supply of raw materials, significant added value and the use of the very latest technologies will have secured Upper Austria as an important food production location.

4c Entrepreneurship and venture creation will be promoted, existing leading companies and SMEs will receive support through the appropriate frameworks, and new lead companies and potential research headquarters will be attracted to the region.

TOPICS/MEASURES

- Further development, networking and alignment of the activities of the relevant clusters towards the objectives in the field of activity, particularly in the area of technology transfer and cross-sector innovation
- Increase in company innovation capabilities and internationalisation, especially with regard to SMEs
- Support for company founders and young entrepreneurs
- 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
- Development of top locations and settlement of leading companies and those with the potential to become leaders in the future

¹¹ cf. WIFO, ex-ante evaluation, 2013, 142f

4.3.5. Mobility | Logistics

Das The "Mobility | Logistics" field of activity demonstrates marked strengths in the corporate sector, specifically in the areas of vehicles, drive train concepts and complementary services. The necessary key technologies and core competences are similar to those in the field of Industrial Production Processes and therefore a technology-based front-runner strategy would appear to be feasible.

The range of companies outside the core area is multifaceted. Optimised logistics solutions and a strong position in related technical know-how are vital to Upper Austrian competitiveness.

In addition, new and intelligent mobility and logistics solutions can contribute significantly to overcoming the societal challenges addressed in other fields of activity. All in all, technology- and research-based development is to be promoted in line with an explicit front-runner strategy, in order to sustainably secure the competitiveness of a field that is key to Upper Austria's economy. At the same time, innovative and intelligent approaches to production logistics and new forms of mobility, which are more commonly found in non-industrial sectors (e.g. at University of Applied Sciences Steyr or University Linz), as well as complementary ICT fields, are to be further developed synergistically and then used in the core area as a source of impetus and an idea pool.¹²

STRATEGIC OBJECTIVES

- 1a** In 2020, Upper Austria will be a region with energy- and resource-efficient, multi-modal mobility and logistics systems, which will optimally meet the requirements for the movement of people and goods. Intelligent communications and traffic control systems as well as the optimisation of supply networks will play a central role.
- 1b** Strengths in vehicle and drive train concepts (lightweight construction and innovative drive train systems, etc.) will also be extended by 2020 along with solutions in the field of production-related logistics.

EDUCATIONAL POLICY OBJECTIVES

- 2a** In 2020, Upper Austria will be an internationally attractive educational region in the areas of mobility and logistics. A systematic approach to mobility in education will be taught using measures suited to the further development of basic and continuing interdisciplinary education.

TOPICS/MEASURES

- Expansion of university course offerings in the area of drive train technologies and compound materials (innovative lightweight construction in the automotive and aerospace industries)

- Focused development (JKU/FH) through endowed professorships in the fields of lightweight construction, etc.
- Networking and internationalisation of logistics education

RESEARCH POLICY OBJECTIVES

- 3a** By 2020, Upper Austria will have established and expanded internationally visible research competences in the fields of mobility and logistics that are coordinated with business and industry.
- 3b** Upper Austria will support interdisciplinary research and the development of innovative solutions in the fields of mobility and logistics systems, multi-modality, intelligent traffic systems and infrastructure.
- 3c** Upper Austria will promote interdisciplinary research and the development of innovative solutions for efficient vehicle and drive systems and their components with special focus on resource efficiency and lightweight construction.

TOPICS/MEASURES

Central research topics in the "Mobility | Logistics" field of activity are ICT, logistics management, mechatronic systems and materials. Within these research areas, the following topics and measures are defined as focal points:

- Mobility and transport
- Logistics management/supply chain management
- Drive train and vehicle technologies
- Lightweight structures

ECONOMIC POLICY OBJECTIVES

- 4a** By 2020, Upper Austria will be making a significant contribution to the overall competitiveness of the economy and its linkages to international markets, thereby securing the manufacturing region through new forms of mobility and logistics concepts, the promotion of suitable infrastructure, and the support of demand-oriented mobility options.
- 4b** In 2020, Upper Austria will have established itself as an "international logistics region" through the creation of reliable framework conditions as well as advanced location and traffic planning, and will thus support entrepreneurship and venture creation, the further development and settlement of companies.

TOPICS/MEASURES

- Sustained multi-modality
- Optimisation of sustainable logistics processes and transport logistics
- Technology-based logistics concepts
- Promotion of new drive train technologies and vehicle concepts for use in business, industry and society
- Development of business region/attraction of companies
- Further development, joining and alignment of the activities of relevant clusters towards objectives in the Mobility | Logistics field
- Integration into international logistics platforms and networks
- Increase in innovation competence and internationalisation of companies, especially with regard to SMEs
- Support for company founders and young entrepreneurs
- Support for lead companies, headquarters and SMEs in specific niches with high growth potential through specific offers in cooperation with partners in the innovation system

¹² cf. WIFO, ex-ante evaluation, 2013, 139f

4.4. COMPREHENSIVE TOPICS ALONG THE INNOVATION CHAIN

COMPREHENSIVE TOPICS ALONG THE INNOVATION CHAIN

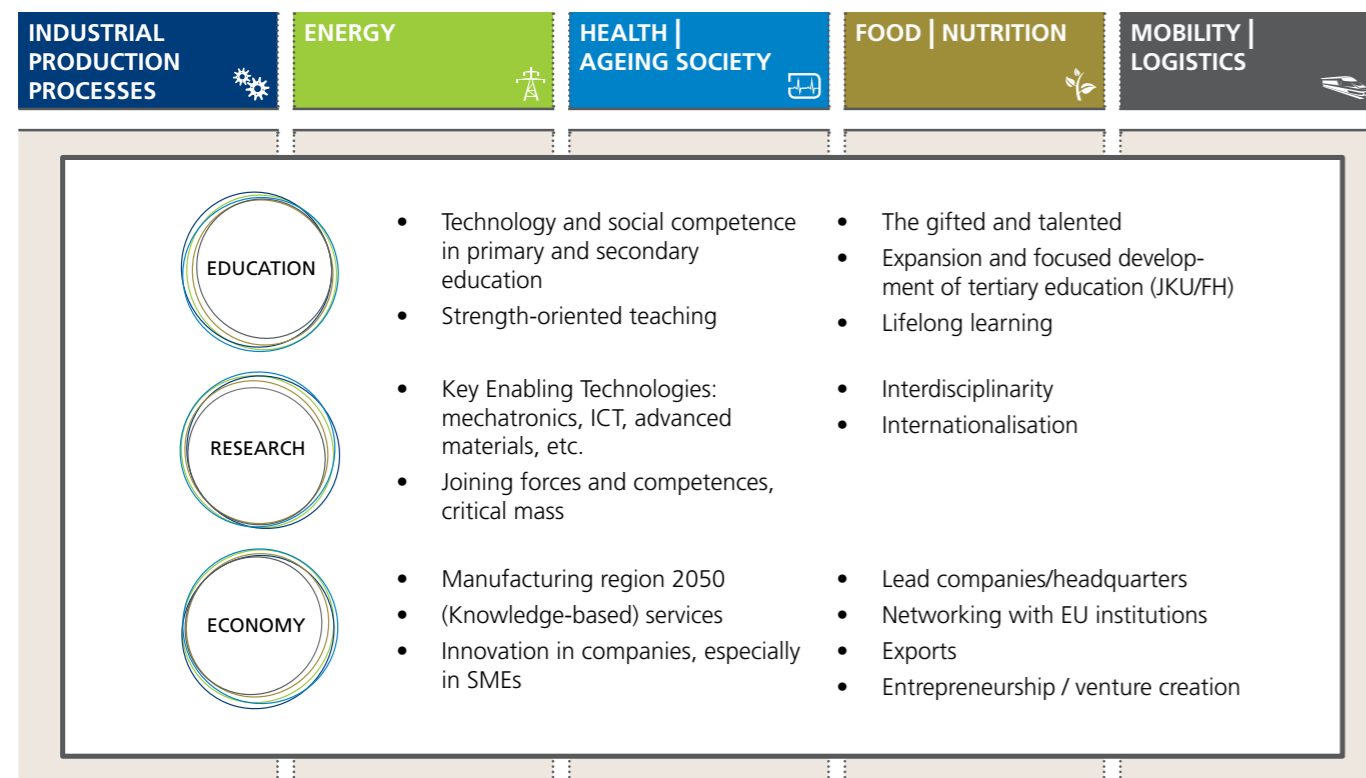


Fig. 2: Comprehensive topics | Source: TMG

4.4.1. Comprehensive topics: Education

TECHNOLOGY AND SOCIAL COMPETENCE IN PRIMARY AND SECONDARY EDUCATION

Upper Austria has already launched numerous technology-oriented initiatives encouraging young people to opt for a technical education. These and new initiatives should be coordinated and combined. A well-rounded experience of technology should be part of every level of primary and secondary education beginning in nursery school. In addition to teaching factual knowledge, Upper Austria's schools must help children to develop their social competences and promote the creativity of future lateral thinkers.

STRENGTH-ORIENTED TEACHING

A paradigm shift is underway in education, involving a move away from an error orientation to the enhancement and promotion of individual abilities and talents. This necessitates teaching styles that are attuned to the individual strengths of children, young people and adults.

THE GIFTED AND TALENTED

Talent must be discovered and nurtured at an early stage. Gifted children and young people require individual and differentiated support at every level of education.

EXPANSION AND FOCUSED DEVELOPMENT OF TERTIARY EDUCATION - JOHANNES KEPLER UNIVERSITY LINZ (JKU), UNIVERSITY OF APPLIED SCIENCES (FH)

In the tertiary education sector, Upper Austrian educational policy aims to increase student numbers and graduations through a balanced educational structure aligned with the needs of the regional economy.¹³ However, like many European regions, Upper Austria is in danger of a future shortage of skilled and qualified personnel. For this reason, Johannes Kepler University Linz (JKU) and the Upper Austrian University of Applied Sciences (FH) are expanding, especially in the field of technical and natural science studies, and are working to improve their positioning.

LIFELONG LEARNING

Qualified personnel are in ever shorter supply and the task is to keep Upper Austrians working longer with a sense of enjoyment and commitment. In addition, the process of knowledge obsolescence is accelerating and continuous education and training is needed. Accordingly, the support of lifelong learning is promoted.

4.4.2. Comprehensive topics: Research

KEY ENABLING TECHNOLOGIES: MECHATRONICS, ICT, MATERIALS

In particular, mechatronics, ICT and advanced materials represent key enabling technologies for the Upper Austrian economy and are thus of special importance in all of the defined fields of activity. In recent years, significant research capacity has been created in these areas. The task in future is to strengthen and expand these competences, and to ensure their interdisciplinary connection.

Cross-sectional topics related to these Key Enabling Technologies such as process simulation, data analysis, ICT security, control and sensor technology and lightweight construction are to be found in all of the defined fields of activity.

DEVELOPING CRITICAL MASS

The Upper Austrian research landscape is characterised on the one hand by distinguished institutions and research centres, especially with regard to the aforementioned Key Enabling Technologies, but on the other hand by numerous research institutions that tend to lack critical mass. The pooling of competences and resources and the related creation of critical mass are essential in order to exploit the appropriate synergies and develop new research areas and methods. In this respect, the development of appropriate Competence Centres and cooperation platforms is of particular significance.

INTERDISCIPLINARITY

In future, interdisciplinary activity and the combination of existing competences will become even more crucial. Existing institutions should therefore be expanded and strategically networked, with a special focus on interdisciplinary research and alignment with needs of Upper Austrian industry.

INTERNATIONALISATION

In combination with the creation of critical mass, the Upper Austrian research landscape should attain improved international visibility and positioning. Upper Austrian research and thus know-how and technology transfer with international partners should be further developed through an intensification of international cooperation.

4.4.3. Comprehensive topics: Economy

MANUFACTURING REGION 2050

In order to secure the current competitive position, long-term efficiency improvements in regional production are vital in line with a "productivity-oriented growth strategy".

Among other aspects, this means the further advancement of the transition of production technologies and value creation networks, which in the German-language region is known as "Industrie 4.0". Therefore, in Upper Austria increased, targeted interdisciplinary coordination and cooperation between industry and scientific players are pivotal.

(KNOWLEDGE-BASED) SERVICES

The internationally highly specialised economy must strengthen its overall economic productivity through technology-based organisational improvements, at the same time ensuring that industrial products are combined with an increasing share of value-added services. This will be provided through the development of an Upper Austrian services strategy.

Innovation in companies, especially SMEs and family firms

Small and medium-sized enterprises (SMEs), 80% of which are under family ownership, form the backbone of the Upper Austrian economy. They must be supported in a targeted manner through measures to increase innovation competence and to promote internationalisation. A special focus in Upper Austria, the region of clusters, is to create international cooperation potential for these companies.

LEAD COMPANIES/HEADQUARTERS

Leading companies and headquarters drive employment and generate multiplier effects through collaboration with regional partners. They make an above-average contribution to research and innovation and most are extremely export-oriented. However, at the international level, the current small-scale university sector is a disadvantage to attracting companies; in addition, due to the volume and structure of its human resource base, Upper Austria is not particularly attractive at present for international research centres.¹⁴ The region must therefore position itself more clearly as a location for leading companies and headquarters and encourage their settlement.

NETWORKING WITH EU INSTITUTIONS

Grand societal challenges will be met through initiatives and stakeholder networks in close cooperation with the European Commission. Upper Austria must act quickly in this regard, particularly as the developments in European research policy for the period 2014-2020 (above all "Horizon 2020") place a greater emphasis on the programmatic coordination of topics and funding instruments on a regional, national and European level.

At the same time, cross-border initiatives and macro-regional strategies such as the "European Danube Region Strategy" and "European Region Danube- Vltava" are gaining importance. This requires the coordinated, targeted concentration of activities to represent Upper Austrian interests in economic and research policy initiatives and networks.

EXPORTS

With a 25.9% share of national goods exports, Upper Austria is by far the nation's leading export

region. The aim of Upper Austria's export strategy is to boost the region's exporting companies and their foreign trade volume. To this end, foreign trade in overseas markets is to be intensified and special focus placed on services and technology exports.

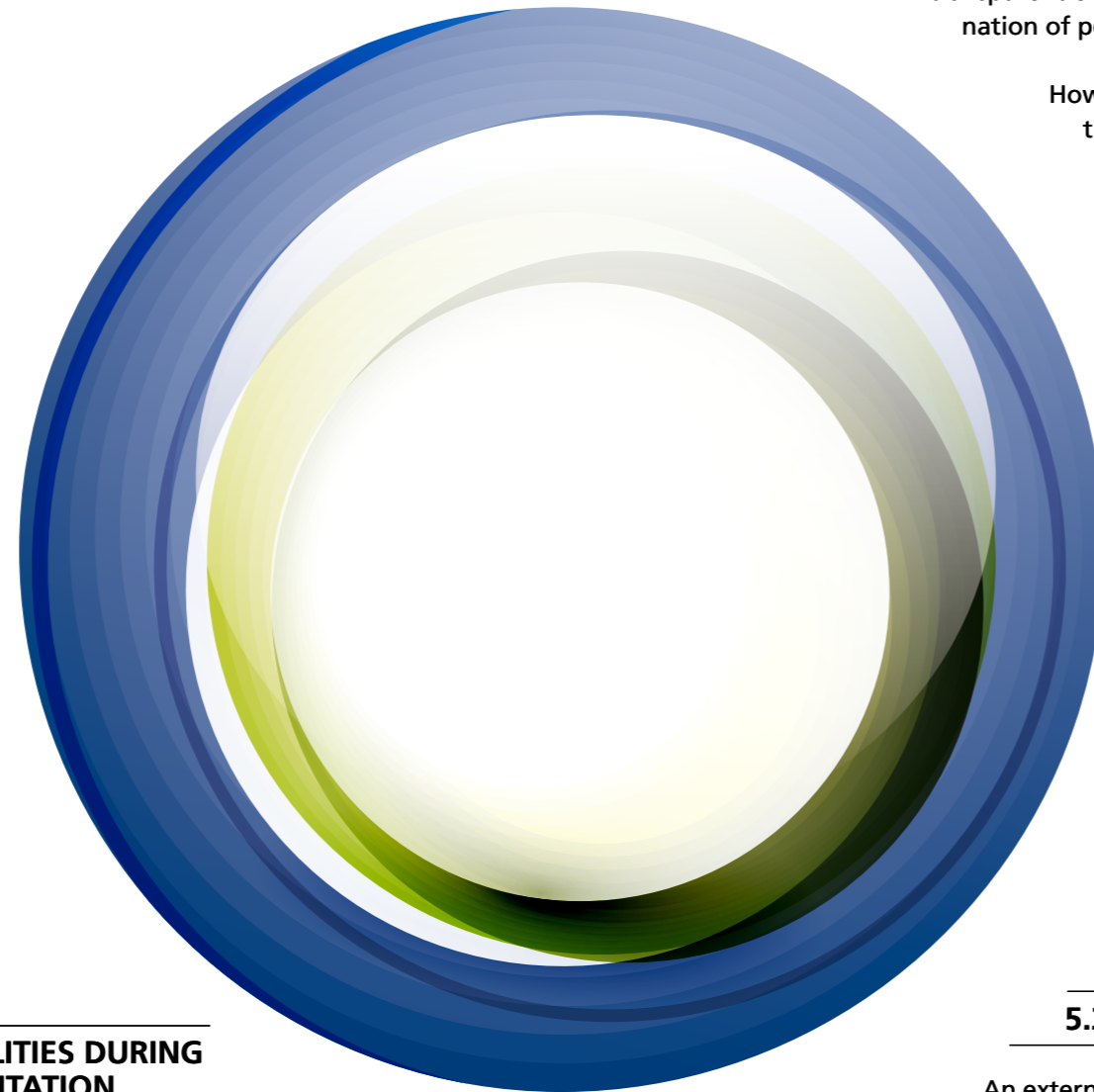
ENTREPRENEURSHIP

Supporting entrepreneurship and the creation of technology-oriented ventures is urgently needed for further innovation-based development. Accordingly, offers of consulting and networking, as well as funding and financing models accompany entrepreneurs from the early conceptual phase right up to market entry.



¹⁴ cf. WIFO, ex-ante evaluation 2013, 10

5. ORGANISATIONAL IMPLEMENTATION/ ONGOING PROCESSES



Field of activity management will act as process owner for the field of activity committees, providing them with organisational support and facilitating the implementation of measures and topics.

A transparent evaluation process is needed for project selection, taking into account the elimination of potential conflicts of interest.

However, at the same time, opportunities must be created within the fields of activity for the implementation of flexible coordination processes and an efficient division of labour that goes beyond hierarchies and corporate identities.

5.2. FINANCIAL VOLUME OF THE PROGRAMME

The total financial volume of the programme includes a share from the Upper Austrian government as well as third-party contributions. The Upper Austrian ministries for research and economy will each contribute approximately €25 million for the duration of the project. The remaining €00 million will be financed by project partners and third-party funding. The total volume for the programme period from 2014 to 2020 will thus amount to a minimum of €1.35 billion.

The Directorate for Regional Planning, Economical and Rural Development, Department of Economy and the Directorate for Education and Society have been entrusted with the management of regional funding from the Upper Austrian government, as long as the required financial support is provided by the Upper Austrian parliament for the respective budget year.

Individual project funding decisions will lie with the Upper Austrian government on the basis of the annual budget.

5.3. INTERIM EVALUATION 2016

An external interim evaluation of the topics and measures is already planned for 2016 as part of an evidence-based economic policy.

5.4. INDICATORS

A major step in programme development is the preparation of a coordinated set of indicators.

In line with impact-oriented public administration, starting from previously collected core strategy key indicators (Joanneum Research, regional CIS survey), operational result and effectiveness indicators are to be established on the level of topic and measure for each field of activity. These indicators will be measured annually in coordination with the persons responsible for the programme.

5.1. ROLES AND RESPONSIBILITIES DURING PROGRAMME IMPLEMENTATION

In general, roles and responsibilities are allocated in the programme by consolidating tasks, competence and responsibility. Positive experiences during programme preparation indicate that it is productive to retain existing roles and responsibilities, which means that the competences of the Upper Austrian Council for Research and Technology (RFT) and the large agencies TMG and UAR will continue to be employed.

The ministry representatives will act as the principal (the administrative departments for economy and directorate for education act as the units responsible for funding), while field of activity committees will carry out the strategic development work and representation (supported through field of activity management).

5.5. ANNUAL CONTROL AND STEERING CYCLE AT PROGRAMME AND POLICY LEVELS

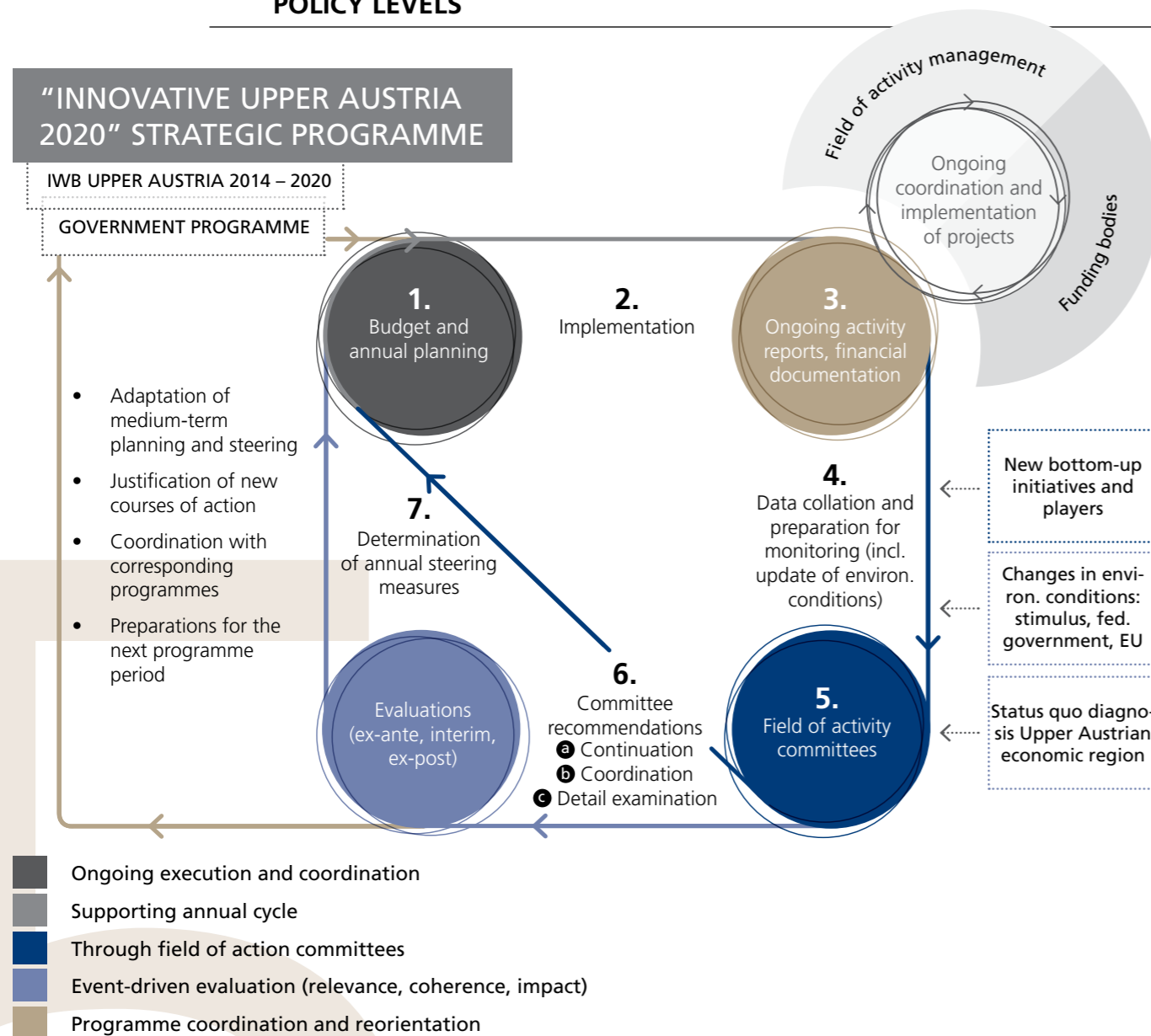


Fig. 3: Integration of monitoring processes into the steering cycle | Source: Joanneum Research/Policies, internal visualisation

5.6. PROJECT SUBMISSIONS

The project selection procedure contains the following elements:

- Budgets for the measures/topics
- Date of the calls for proposal
- Forms/evaluation criteria
- Rules for participation
- Impact indicators
- Legal framework (Union Framework for State Aid for Research, Development and Innovation "new", Upper Austrian funding guidelines, etc.)
- Publication obligations

The modalities of project selection will be published on the Internet in due time.

6. CORRESPONDING PROGRAMMES IN UPPER AUSTRIA

6.1. INTRODUCTION

The new strategic economic and research programme builds on and supplements existing programmes of the Upper Austrian government. The most important corresponding programmes are described here in brief.

6.2. "ARBEITSPLATZ OBERÖSTERREICH 2020"

With the strategic labour market policy programme "Arbeitsplatz Oberösterreich 2020" ("Workplace Upper Austria 2020") preparations are being made for the major labour market policy challenges of the future, where the focus is on the key elements of "guaranteed education", "support of qualified personnel" and "demand for qualified personnel". In particular, the programme deals with the need to utilise available human resources in terms of women, young people, migrants, persons with health-related employment limitations and the elderly. A further goal is to keep older persons working longer. The topic of the "future of work" is also part of the strategic focus.¹⁵

"Arbeitsplatz Oberösterreich 2020" is a framework programme that envisions linking the active labour market policy of the Upper Austrian government with the formulated economic and research policy focal points of this new Strategic Programme in order to create an ideal interplay between regional, economic and labour market policy.

6.3. EDUCATION

The prime objective of Upper Austrian educational policy is to facilitate personal self-realisation by offering a programme of lifelong education and training, at the heart of which is the development and strengthening of character as well as individual talents and skills.

The following focal points from the strategic guidelines in the educational sector were considered during the preparation of this new programme:

- Elementary education: as the first introduction to formal education and a crucial educational institution, nursery schools should be better appreciated and supported.
- Secondary education: A paradigm shift is beginning towards strength-oriented teaching, and the promotion of talent and ability is now a prime objective.
- Tertiary education: The excellent reputation of the Johannes Kepler University Linz and the Upper Austrian University of Applied Sciences is to be enhanced through the development of areas of excellence. The creation of a medical faculty will provide a pool of qualified human medicine grad-

uates while stimulating further research and scientific development in this field. Researchers in established areas such as medical mechatronics and informatics, medical chemistry and physics, as well as health economics and medical law will be better able to cooperate with clinical researchers.

- Lifelong learning: Education will be firmly established as a continuous process through all stages of life.¹⁶

6.4. "OÖ. GESAMTVERKEHRSKONZEPT 2008"

The "Oö. Gesamtverkehrskonzept 2008" ("Upper Austrian General Transport Concept 2008") foresees a sustainable transport policy for Upper Austria, which will secure employment and the expansion of industry in the region, as well as reducing environmental impact. The main emphases lie on the further development of public transport, regional traffic concepts and mobility management infrastructure. Other focal points of the concept include securing mobility for the entire population and the optimal coordination of land use and transport infrastructure.¹⁷

"Innovative Upper Austria 2020" has allocated a separate field of activity to Mobility/Logistics. The measures and topics for this field are aimed at promoting resource-efficient multi-modal mobility and logistics systems in Upper Austria.

6.5. "ENERGIEZUKUNFT 2030"

In 2006, the Upper Austrian ministry for Energy analysed various "green" energy sources and presented the realisable potential up to 2030 under the programme "Energiezukunft 2030" ("Energy Future 2030"). Assuming various consumption trends, energy scenarios were established through 2030 related to electricity, heating, transport and the total primary energy demand.

In 2007, the Upper Austrian government formulated and agreed on detailed targets for the region's energy future up to 2030: sufficient regional production of renewable energy to cover all of Upper Austria's electricity and heat needs, a gradual 39% reduction in Upper Austria's heating demand on the basis of both the European action plan and Upper Austria's renewable energy potential, and up to 41% reduction in the use of diesel and petrol fossil fuels in line with the federal government's biogenous fuel objectives (taking into account fuel tourism). A programme was also drawn up with suggestions for 148 measures, which are currently being implemented.¹⁸

This new Strategic Programme also includes a focus on a range of measures in Energy as a separate field of activity.

6.6. "KURSBUCH TOURISMUS OBERÖSTERREICH 2011 – 2016"

"Kursbuch Tourismus Oberösterreich 2011 – 2016" ("Upper Austrian Tourism Guidelines 2011 – 2016") lays down strategic guidelines for the dynamic and successful advancement of the tourism industry at all operational, organisational and institutional levels.

The document sets out a fundamental realignment, transitioning the current market from a purely thematic orientation to the uncompromising implementation of a branding strategy with branded destinations and product brands.⁹

As a result of cross-topic integration, one key emphasis in the Guidelines is the "health & wellness" motif. The measures envisioned in the Health | Ageing Society field of activity in this new Strategic Programme are supplementary in this regard and spotlight activities for preventive medicine facilities.

¹⁵ cf. "Arbeitsplatz Oberösterreich 2020"

¹⁶ cf. "Oberösterreichischer Bildungsbericht", 2013
¹⁷ cf. "Gesamtverkehrskonzept Oberösterreich 2008"
¹⁸ cf. "Energiezukunft 2030"
¹⁹ cf. "Kursbuch Tourismus Oberösterreich 2011 - 2016"

7. OUTLOOK

A decisive element of Strategic Programmes is their future viability. Therefore, rather than focusing primarily on what has been done to date, these programmes must anticipate future developments, or at least be open to them (“dare something new”).

It is certain that the megatrends illustrated in Fig.4 and the corresponding research areas will continue to occupy us for the next ten years and beyond.

- Climate change
- Urbanisation and mega-cities
- Demographic development
- Globalisation

MEGATRENDS

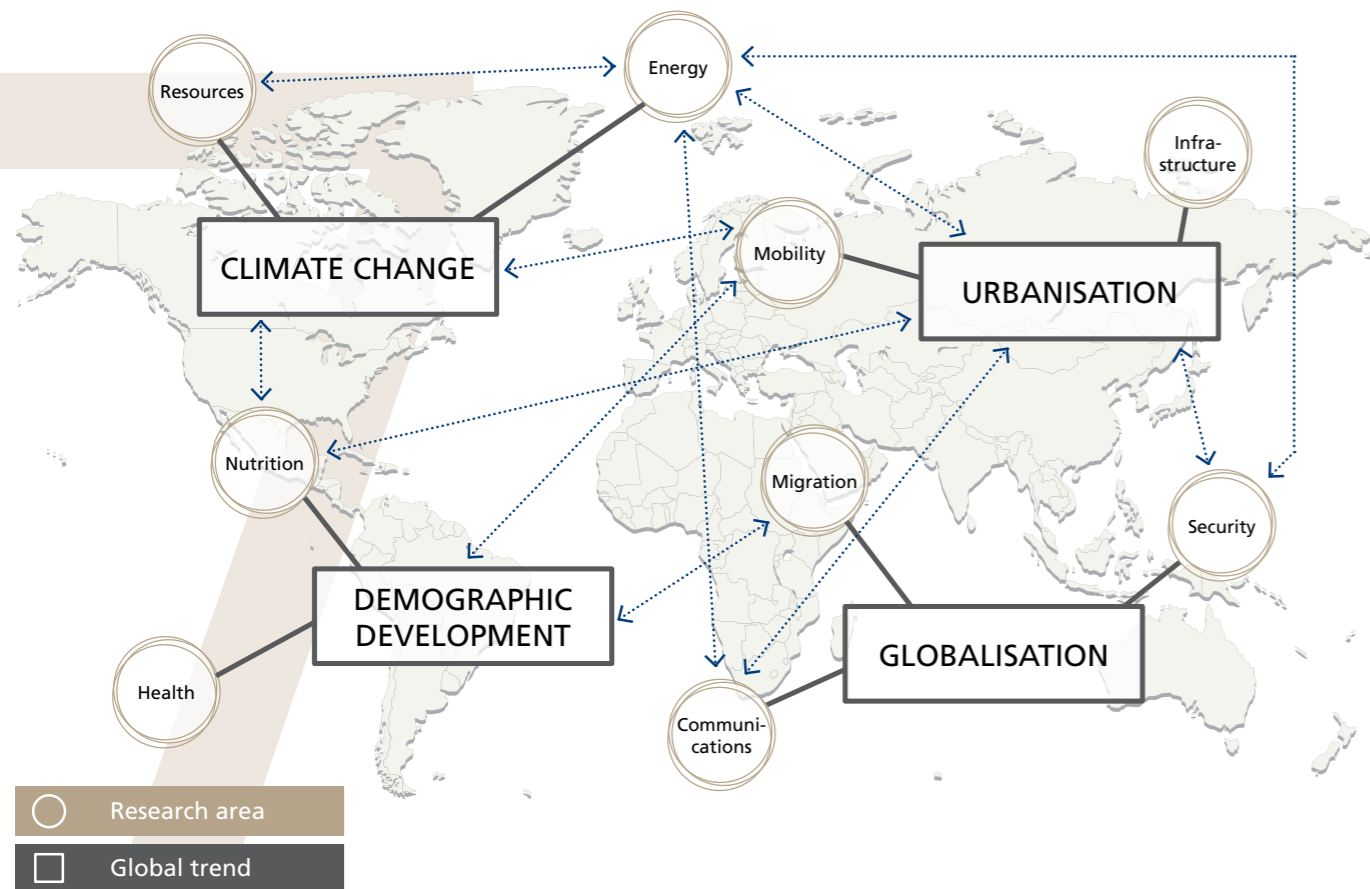


Fig. 4: Megatrends | Sources: Communication of the EU Commission (COM2009-512/3); High-Tech Strategy 2020 for Germany; W.Heß: Megatrends-Economic Research; RFTE Strategy 2020

For a region of technology and industry like Upper Austria, the question of which technology will trigger the sixth global Kondratieff cycle is naturally of major significance. It is proven that the introduction of new technologies, such as the arrival of the steam engine in 1820, has unleashed especially powerful and positive economic cycles.

KONDRATIEFF CYCLES

KONDRATIEFF CYCLES	1825 STEAM ENGINE COTTON	1873 STEEL RAILWAYS STEAMSHIPS	1913 ELECTRICITY CHEMICALS	1966 OIL, AUTOMOTIVE ELECTRONICS	2015 INFORMATION SOCIETY SUSTAINABILITY RESOURCE EFFICIENCY
	1793 – 1847	1847 – 1893	1893 – 1939	1939 – 1989	1989 – 2040
	1 st cycle	2 nd cycle	3 rd cycle	4 th cycle	5 th cycle
1. Fundamental needs	Work made easier	Making worldwide resources accessible	Raising the quality of urban life	Mobility and communications	Sustainable living standards, environmental protection
2. Global networks	Trade networks	Transport networks	Energy networks	Communications networks, roads	Global knowledge networks (Internet)
3. Influential new applications	Machines	Locomotives, stations	Lighting, electrical devices	Cars, telephones, radio, TV	Internet, renewable energies
4. Influential technologies	Steam	Steel	Electricity	Combustion engines (Otto, Diesel), electronics	Computers, Internet, environmental technologies
5. Synergetic applications	Consumer goods	Steamships	Electro-chemicals, aluminium	Petroleum products, weapons	Mobile computing, Internet shopping
6. Technological synergies	Mechanics	Large drives	Industrial plants, power plants	Systems	Computers, environmental technologies

Fig. 5: Kondratieff cycles | Source: TMG visualisation based on literature relating to the Kondratieff cycle

Therefore, the question is what will be the “steam engine” in the period from 2015 to 2050? Experts continue to have divergent opinions but “education as business”, “health & wellness”, “information”, “INDUSTRY 4.0” and “smart materials” are all under discussion.

It has also been recognised that Kondratieff cycles demonstrate a tendency to move away from (classic) technologies towards quality of life.

With its Strategic Programme “Innovative Upper Austria 2020”, Upper Austria is ideally equipped for the aforementioned potential Kondratieff cycles, as both new technologies such as “INDUSTRY 4.0” or “smart materials” and the topic of quality of life (ageing society, health, nutrition) are well represented in the core strategies and fields of activity of the programme.

The stakeholders in the new programme are therefore convinced that with the “Innovative Upper Austria 2020” programme an important, innovative step with a high level of “future viability” has been taken.

Upper Austria has set itself the target of moving away from its position of “innovation follower” among the regions of Europe to becoming one of the community’s “innovation leaders” by 2020. The new “Innovative Upper Austria 2020” programme will make a major contribution to achieving this goal.

LIST OF FIGURES

Fig. 1:	Upper Austria's Strategic Economic and Research Programme for 2014 to 2020 "Innovative Upper Austria 2020"	12
Fig. 2:	Comprehensive topics	28
Fig. 3:	Integration of monitoring processes into the steering cycle	34
Fig. 4:	Megatrends	38
Fig. 5:	Kondratieff cycles	39

LIST OF ABBREVIATIONS

A	Austria
AMS	Austrian Job Service
ERDF	European Regional Development Fund
EU	European Union
FH	Upper Austrian University of Applied Sciences
RTI	Research, technology, innovation
HTL	Secondary Technical College
ICT	Information and communications technology
JKU	Johannes Kepler University Linz
R&D	Research and development
RFT OÖ	Upper Austrian Council for Research and Technology
SME	Small and medium-sized enterprise
TMG	Upper Austrian Technology and Marketing Company
UA	Upper Austria
UAR	Upper Austrian Research
WIFO	Economic Research Institute

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