

OÖROK



Policy framework for smart specialisation in Austria



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POLICY FRAMEWORK FOR SMART SPECIALISATION IN AUSTRIA

Editors:

convelop - cooperative knowledge design gmbh

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with the collaboration of Magdalena Kleinberger-Pierer

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EDITORIAL INFORMATION

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Foreword

OF THE ÖROK OFFICE

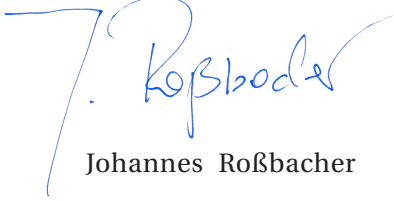
Within the framework of the Austrian Conference on Spatial Planning (ÖROK), a strategic monitoring process was established to implement Austria's Partnership Agreement with the European Commission on the European Structural and Investments Funds 2014–2020 ("STRAT.AT 2020"). One of the elements was the creation of the "STRAT.AT 2020 Partnership" on the theme of *Smart Specialisation* as a platform for the federal government and the *Länder* to share their views on relevant strategies. The goal was to achieve a common understanding of the interaction of the national RTI strategy with the economic and innovation strategies of the *Länder* thereby creating impulses for new ideas – internally and externally. The Partnership also serves as framework to support the regular communication between the federal government and the *Länder* regarding RTI policy matters. Communication takes place within existing formats, specifically at the meetings of the *Bundesländerdialog* organised by the Federal Ministry of Science, Research and Economy and also within the ÖROK Subcommittee for Regional Economy, which deals with regional policy in the context of RTI.

Two "strategy meetings" on *Smart Specialisation* were held within the STRAT.AT 2020 Partnership. On 8 and 9 March 2016, a conference was held in Linz with the participation of the European Commission as well as Austrian experts. The purpose of the conference was to facilitate the exchange of views by the persons responsible for strategy at the federal and *Länder* levels and to deepen a common understanding of the concept behind the "Smart Specialisation Strategies (S3/RIS3)" with representatives of the Directorate General for Regional Policy as well as with the Directorate General for Research of the European Commission. On 20 April 2016, a second "Strategy Day" of the Partnership was held in Vienna with the international participation of a representative from the region "Brainport Eindhoven" (Netherlands). The outcome of the first meeting in Linz was addressed and discussed in more detail there, with the focus on themes such as cooperation, monitoring and steering. The meeting in Dornbirn on 27 April 2016 organized together with the second meeting of the Monitoring Committee for the Austrian ERDF Programme under the objective "IGJ" (Investment in Growth and Jobs) 2014–2020 achieved an atmosphere of mutual respect and partnership for sharing views on Austria's approach to *Smart Specialisation*.

The outcome of this discussion process conducted with external support was the further development of the "background paper" from 2014 to produce the document "Policy Framework for *Smart Specialisation* in Austria" accorded with the relevant participants. On 28 June 2016, the document was discussed by the members of the Subcommittee for Regional Economy of ÖROK, which has leadership responsibility for STRAT.AT 2020, who also accepted and approved the paper and the plan to publish it.

This publication also contains a foreword by the Steering Group. It has several sections with the first section covering the concept of *Smart Specialisation*. The second section gives an overview of the policy framework and the approach to *Smart Specialisation* taken in Austria. The third section presents the activities at the national level and the RTI strategy of the federal government. The fourth section focuses on the RTI strategy and the approaches taken by the *Länder*. The fifth and final section presents a summary of Austria's policy framework for *Smart Specialisation*. The Annex contains overviews of the individual strategies.

This publication addresses an interested expert audience and also aims to raise awareness for a common understanding of *Smart Specialisation* apart from serving as documentation. The publication is bilingual (German/English) to facilitate communication and to make it easier for experts to share and discuss views at the European level.



Johannes Roßbacher



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Managing Directors

Foreword

OF THE STEERING GROUP

THE STRENGTHS AND CHALLENGES OF *SMART SPECIALISATION* IN AUSTRIA

With the STRAT.AT 2020 Partnership on *Smart Specialisation*, the Austrian Conference on Spatial Planning (ÖROK) created a framework for the relevant stakeholders of the *Länder* and federal government to share their views. The STRAT.AT 2020 Partnership supported an engaged discussion that ultimately resulted in the document “Policy Framework for *Smart Specialisation* in Austria”, which was accorded with all stakeholders and published. Within this discourse, we positioned Austria’s approach to *Smart Specialisation* within the European frame of reference and developed it further.

The timing was right for the discussion within the STRAT.AT 2020 Partnership: meanwhile, all *Länder* have RTI strategies. The experience gained from the strategy development process, from dealing with the content and the themes of the strategies encouraged joint reflection and helped us to learn from each other for implementation and monitoring. A common understanding of *Smart Specialisation* was developed within the scope of an open and constructive process, and both the strengths and the progressive development of the Austrian RTI system were openly discussed.

We would like to point out that Austria started on the path to *Smart Specialisation* very early and that all of the core elements of *Smart Specialisation* are well-anchored within the Austrian policy framework in one form or another. This is attributable not least to the tradition of endogenous, participative development with a focus on regional strengths as well as to the successful practice of balancing divergent interests within planning processes.

In summary, the discussion revealed the following *strengths* for Austria:

- Austria has **strategies for all levels** (EU, national, including a growing number of sectoral strategies, *Länder*). The strategies all reference each other. The time delay in the drafting process makes it possible to learn from each other.
- Austria has a long tradition and experience in **participative development processes**, in balancing interests and in involving stakeholders in planning processes. The comprehensive inclusion of stakeholders helps broaden effectiveness and achieve a wide **acceptance of the strategies**. The creation process encouraged new developments and inspired new cooperative ventures.
- The **strategies** are usually interpreted as **dynamic**. Usually, there are monitoring and implementation processes in place that operationalise and define strategies in more specific terms (e.g. in the form of working programmes).
- **Themes** are defined for all strategies, with a regional differentiation between predominantly industrialised regions and those with a concentration in the service sectors being observed.

Therefore, Austria is on a good path. Yet, the open discussions also revealed significant challenges at various levels that need to be taken into account in the future:

- Is a further opening and closer **cooperation across administrative boundaries** possible? The **inclusion** of the relevant **partners** in the **strategy creation process** was viewed as especially important. Incentives for cross-border cooperation, for example, at the national level or as part of a regional identity can have a positive influence on the success of cooperative ventures. When defining a **frame of reference for regional strategies**, one should take into account the functional spaces and the surrounding areas. Regions may moreover be defined by common challenges and dynamics that flow into the definitions of the themes (e.g. Alpine region). Synergies with neighbouring regions and surrounding areas as well as with regions with similar challenges can be taken into consideration better by being more open to outside ideas and bringing in **external perspectives**.
- To what extent does a strategy consider the regional, national, European and international **environment** and reference these? Do we plan along international value chains, European challenges and are our “neighbours” part of our positioning? Which structures are absolutely necessary at a location? Where does strategic access to external expertise count; where are infrastructure and implementation partners important? RTI strategies should not shy away from the international and inter-regional frame of reference; they should support access, but also enable interconnected growth and smart niches.
- Is it possible to attain a new quality in **cooperation between the federal government and the *Länder***, especially when overhauling RTI strategies? There is broad consensus that in the light of the changed framework conditions, the *bottom-up* elements and regional challenges should be considered more strongly when updating Austria's RTI strategy.
- **How smart is the specialisation?** Although many themes are part of the RTI strategies, what degree of granularity is the right one for the themes and where is the critical mass needed to develop those themes that hold a promise for the future? Rather, shouldn't social challenges and topical issues serve as guidance for action? In this context, the competence of businesses and knowledge institutions should be tapped, but also of relevant new partners – for example, civil society actors.
- How clear is the **overall system**? The interaction of the federal government and *Länder* is characterized by mutual learning. The regional strategies are developed divergently across different timelines and processes in accordance with the autonomy of the federal states. The asynchronous process creates the advantage of being able to exchange views and learn from each other. At the same time, there is no uniform standard for recording and reporting, and this makes it hard to maintain a **systematic** and continuous **overview** of the status and implementation of the strategies. Wouldn't a stronger focus on clear, **measurable goals** with the corresponding **set of indicators** better serve a future generation of *Smart Specialisation* as a foundation for a maintaining a systematic overview and for overarching monitoring?
- Do we need more **unconventional approaches**? Currently, there is hardly any room for unconventional measures in the strategies. More progressive and unconventional measures should be included in the processes and in stakeholder involvement. This also means being open to social innovation.
- The issue for the coming years will be how to deal with the growing challenges in times of scarce **resources**. This calls for a different and new culture of concentration and selectivity when defining themes and measures as well as a greater focus on initiating change processes, on coordination and cooperation.

With the STRAT.AT 2020 Partnership for *Smart Specialisation*, the core aspects of the features of Austria's RTI policy have shifted to the centre of attention of all stakeholders. In the future it will be important to strategically exploit the strengths and build on these, to tackle the open challenges and continue the constructive collaboration started.



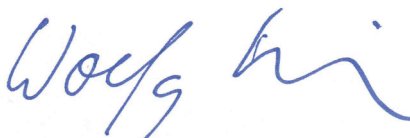
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SMART SPECIALISATION – A NEW FRAME OF REFERENCE OF THE EUROPEAN UNION

With the Europe 2020 strategy, the EU has committed itself to promote smart, sustainable and inclusive growth. The EU developed the concept of the Smart Specialisation Strategy (RIS3¹) for the implementation at the national and regional level, which is to serve as the relevant long-term frame of reference. The aim of the strategies developed inclusively with stakeholders and relevant partners is to achieve a more efficient use of funds and synergy effects in the relevant policy fields at the different levels.

Box 1: The concept of Smart Specialisation – core elements²

- They direct financial assistance and investment measures to the key national and regional priorities, challenges and needs to achieve knowledge-based development.
- They are based on the specific strengths, competitive advantages and capacity knowledge of the Länder and regions.
- They support technology and practice-based innovation, and serve as incentive for investments by the private sector.
- They fully involve stakeholders in all aspects and encourage innovation and experimentation.
- They are evidence-based and include well-thought-out monitoring and evaluation systems.

As a knowledge-based development concept, Smart Specialisation is a locational element of the EU 2020 strategy for smart, sustainable and inclusive growth. At the EU level, the concept of Smart Specialisation is an integral part of EU cohesion policy as one of the so-called ex-ante conditionalities. The allocation of funds from the European Fund for Regional Develop-

ment for research, technology development and innovation is thus contingent on the national or regional Smart Specialisation strategies. The intention here is to guarantee a more efficient, strategy-guided deployment of EU cohesion funds for R&D and innovation.³

The explanations on the policy framework for Smart Specialisation in Austria presented in the following sections were prepared with a view to the ex-ante conditionalities of EU cohesion policy 2014 to 2020. Within the scope of the monitoring process for the implementation of the partnership agreement, the **STRAT.AT 2020 Partnership “Smart Specialisation”** was established within the framework of the Austrian Conference on Spatial Planning (Österreichische Raumordnungskonferenz, ÖROK) (see www.oerok.gv.at). This partnership provides a platform for sharing views on the concept of Smart Specialisation well as on the relevant strategies of the federal government and of the Länder.

1 RIS3 and S3 are used synonymously for Smart Specialisation strategies.

2 European Commission 2014: National/Regional Innovation Strategies for Intelligent Specialisation (RIS3) ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_de.pdf

3 The EU defines ex-ante conditionalities in the Common Provisions Regulation for the ESI Funds 2014-2020 as follows: “The existence of a national or regional Smart Specialisation strategy in line with the National Reform Programme, to leverage private research and innovation expenditure, which complies with the features of well-performing national or regional research and innovation systems”. Common Provisions Regulation of the ESI Funds 1303/2013 Annex XI, Part I, thematic objective 1 on ex-ante conditionalities.

POLICY FRAMEWORK FOR SMART SPECIALISATION IN AUSTRIA

The research, technology and innovation (RTI) strategy of the federal government “Becoming an Innovation Leader” was therefore sent to the European Commission as the core document for Smart Specialisation in Austria and as fulfilment of the ex-ante conditionalities of the ESI Funds Common Provisions Regulation 2014–2020, and was accepted as such by the European Commission.⁴

In Austria, apart from the federal level, the **Länder** – also referred to as regions in this context – may act autonomously in non-sovereign fields. They have political representatives and corresponding budgets. In the past decades, the Länder have gained a more prominent role in the area of RTI, encouraged, among other things, by (i) the instruments of EU regional policy, (ii) the concept of Regional Innovation Systems and (iii) impulses from the federal government, especially within the framework of the “structural programmes”. Therefore, for Austria a **“Policy Framework for Smart Specialisation”** is in place in which the research, technology and innovation strategy of the federal government is the core element and serves as central frame of reference for the regional level and their RTI strategies. This policy framework is presented in the following sections in an overview of the Research, Technology and Innovation Strategy of the federal government and the RTI strategies of the Länder.

It must also be mentioned in this context that Austria has played an active role from the very start in defining the content and influencing discussions regarding Smart Specialisation. Austria – jointly with Flanders and Finland – was the initiator and leader of the international **OECD project** “Smart Specialisation in Global Value Chains” through which the OECD supported the European Commission with proposals for regional implementation and with practical examples. Austria is one of the key partners for the European Commission and the Joint Research Center in Sevilla (S3 Platform) for putting the academic concept of Smart Specialisation into practice. To this end, **“RIS3-KEY”** was developed, which among other

things, provides European regions with uncomplicated start up help for the RIS3 concept.⁵ The Federal Ministry for Science, Research and the Economy as well as regions such as Upper Austria and Lower Austria cooperate with DG REGIO of the European Commission and with partner regions throughout Europe to achieve a comprehensive implementation of the concept. The Federal Ministry for Science, Research and the Economy has a staff unit for knowledge-driven business location policy and Smart Specialisation.⁶

We would like to stress that the discussion regarding Smart Specialisation has heavily and positively influenced the current generation of research, technology and innovation strategies. In particular, the more intense involvement of universities in territorial development strategies has brought new qualities to the process of location development.

Austria’s position on Smart Specialisation and its implementation described below was prepared and discussed within the scope of the Smart Specialisation partnership.

4 This must be viewed, above all, before the backdrop that (i) Austria, in the period from 2014 to 2020, merged the EU Cohesion Policy Programme “Investments in Growth and Jobs – ERDF” into a programme for all of Austria, and (ii), around 87% of public expenditure for R&D comes from the federal government.

5 The RIS3 Key has meanwhile been translated into six further languages. www.bmfwf.gv.at/ris3-key

6 www.bmfwf.gv.at/standort and www.era.gv.at/regions

Box 2: Austria's Approach to Smart Specialisation

The concept of **Smart Specialisation** is a **European frame of reference** for (regional) research, technology and innovation policies. For Austria, Smart Specialisation is a **concept of long-term** relevance that aims to boost growth and competitiveness.

With the concept of Smart Specialisation, a **new generation of business location strategies** has been developed that defines thematic investment priorities for those locations where the specific strengths, competencies and development potentials hold the promise of boosting the economy and society. They are based on innovation and international market success thereby also enabling it to master future challenges. For Austria, the long-term potential of the concept is perceived to lie in the support provided for a new **knowledge-driven location policy**. The strategies are designed to facilitate the development of a productive “eco-system” that originates in the region.

From Austria's perspective, a particularly **valuable element** is the process of “**entrepreneurial discovery**”. This refers to the ongoing process of participation by enterprises and the knowledge sector, and to the closer involvement of business, administration, education and research as well as NGOs within the innovation system to jointly develop themes.

Newer empirical analyses by WIFO point out the special significance of diversification of regional economic structures into new areas based on their existing economic and technological competencies, while hardly any growth impulses may be expected from a narrow industry specialisation. In this respect, the concept of “**Smart Diversification**” is more meaningful and useful when referring to the (re-)combination of strengths with technologies of the future, new markets and target groups to achieve a transformation process.

Austria would like to stress the following points that not only contribute to the **further contextual development** of the concept, but also increases its **relevance for practice**.

- **Open with respect to process design:** Smart specialisation should be understood as a **process** in which the relevant stakeholders work together in location development by taking an evidence-based and outcome-oriented approach. Flexibility in the interpretation and concrete application of the core elements of RIS3 must be possible in the Member States and their regions. When assessing Smart Specialisation strategies, existing practices for “strategy formulation” in the Member States and regions, the political realities and framework conditions must be taken into account. This would support acceptance of the concept among the policy actors.
- **Open with respect to content:** From Austria's perspective, the issue on hand is not so much to proceed according to a master plan, but rather to organise an ongoing development process. This may be achieved, for example, by “rolling planning” or by multi-tier planning (e.g. concrete implementation of general strategies in working programmes).
- **Open with respect to innovation:** An open interpretation of the concept of innovation is advocated to achieve a wider integration of approaches such as open innovation and social innovation as well as creativity and to include social themes in the strategy. Austria has a broad understanding of the concept of innovation which is not restricted exclusively to technology and is well aware of the fact that it needs to achieve progress in the area of “social innovation”.
- **Consideration of framework conditions:** Coordination of the policy areas is an important factor. It is pointed out in this context that EU financial assistance legislation must grant adequate room for the application of instruments to promote business and innovation in order to be able to advance Smart Specialisation accordingly.

Box 3: Empirical Evidence for Austria in the Context of Smart Specialisation “Smart diversification based on endogenous strengths”

The latest research by WIFO⁷ for Austria shows that based on an overall economic assessment, the growth impulses for employment and the labour market tend to come less from a narrow specialisation on a few industries and leading sectors, but rather from a regional diversity of industries. A differentiated analysis by sector and region reveals that in **human capital-intensive urban regions** and their surrounding areas and also in **manufacturing** so-called “**related diversity**” has a significant positive correlation with employment dynamic. In the more rural regions – usually without any prominent industrial cores – the growth impulses for employment and the labour market tend to come from unrelated diversity of industries.

“Related diversity” means a **portfolio** of similar and related industries. Therefore, it is not individual sectors that are crucial for growth and employment, but rather a diverse array of related industries. These empirical findings thus support arguments in favour of a **regional structural policy** that places a greater focus on **diversification** of economic structures, combined with well-thought-out **vertical priorities**.

Therefore, the further development of a **regional economic structure** should not concentrate primarily on a narrow core of clusters or strong points, but rather along auxiliary, related industries and on promising technologies that are still weakly developed.

This essentially corresponds to the concept of **Smart Specialisation**, which, according to its fundamental conception, it is not the deepening of regional areas of competence, but rather a “recombination” (e.g. widening of existing know-how by adding new technologies/knowledge areas such as mechatronics, industry 4.0 or transformation processes such as the transition from the manufacture of textiles for garments to industrial high-tech textiles).

Therefore, the aim is to support entrepreneurial search and discovery processes to promote a forward-looking diversification based on existing competencies and endogenous strengths. In this respect, the empirical results are evidence of the feasibility of the concept of Smart Specialisation for Austria. However, it also shows that a narrow and static interpretation of the concept should be avoided.

7 Firgo and Mayerhofer (2015): Wissens-Spillovers und regionale Entwicklung – welche strukturpolitische Ausrichtung optimiert das Wachstum? WIFO Study
Firgo and Mayerhofer (2016): (Un)Related Variety and Employment Growth at the Sub-Regional Level. WIFO Working Paper No. 511

BECOMING AN INNOVATION LEADER

Dynamic change within the innovation system

Austria's innovation system and innovation policy underwent a process of far-reaching change that began at the latest with the phase of integration into the EU in the 1990s. The trend of a wider understanding of systemic innovation changes was accompanied by a change in the perceived role of research, technology and innovation policy. The allocation of public funds for R&D increased substantially and likewise private investment in research and development by the business sector. The thematically-focused programmes were expanded and supplemented by structural programmes to reduce recognized RTI weaknesses.⁸ Later on, a reorganisation of the institutional landscape also took place (reform of agencies, creation of the Council for Research and Technology as an advisory body to the federal government, University Organisation Act, improved evaluation culture⁹). The transition towards a research-intensive innovation system is the most pronounced feature of this transformation. In this manner, Austria rose to ranks of the so-called "innovation followers" on the EU scoreboard by the mid-2000s.

Basis for the shift in paradigm: evidence-based policy

The practice of regularly conducting analyses¹⁰ and evaluations, especially the evaluation of the Austria's financial assistance schemes for research¹¹ helped to make it clear that a transformation of the growth paradigm was needed in Austria. Specifically, a shift from the long-standing successful strategy of imitative technology focused on the intelligent adaption and rapid diffusion of technological developments towards a growth course driven by research and innovation in the role of technology frontrunner (from "catching-up" to "frontrunning"). This phase was supported by a broad discourse and consultation process carried out throughout the country within

the scope of the Austrian Research Dialogue (Österreichischer Forschungsdialog) and by the proposals and recommendations made by the Council for Research and Technology Development in the summer 2009 for the further development of Austria's research and innovation system.

Interactive policy process for strategy development

Based on the preparatory work and regular feedback rounds with the relevant stakeholders as well as the exchange of views with international experts, the **Research, Technology and Innovation Strategy (RTI)** "Becoming an Innovation Leader" was prepared within the scope of a broad inter-ministerial discussion process.

Box 4: RTI Strategy of the Federal Government: Interactive, Evidence-based Policy Process

- **Dialogue process:** Austrian Research Dialogue (*Österreichischer Forschungsdialog*), a broad discourse and consultation process conducted throughout the country: <http://www.bmwf.gv.at/forschungsdialog>
- **Analytical:** Evaluation of the Austria's financial assistance system for research ("system evaluation") <http://www.fteval.at/> and the research and technology reports: <http://bmwf.gv.at/ftb>
- **Strategic:** Recommendations of the Council for Research and Technology Development ("Strategie 2020") for the further development of the Austrian research and innovation system: <http://www.rat-fte.at>

Austria's strategy processes are characterized by a long-standing culture of systematic inclusion of stakeholder interests and ideas. In the spirit of an "entre-

8 e.g. Lacking culture of cooperation between science and business

9 e.g. By setting up the Austrian platform for research and technology policy evaluation (Plattform für Forschungs- und Technologiepolitikevaluierung, www.fteval.at)

10 Especially within the scope of the work on the Annual Research and Technology Report of the federal government and WIFO White Book: more employment through growth based on innovation and qualification.

11 www.fteval.at

preneurial discovery process”, strategic priorities contain both bottom-up and top-down elements (see e.g. Austrian Research Dialogue¹²). The participating parties could rely on a broad range of analytical works, on the one hand, and on normative (strategic) recommendations, on the other. The economic and social partners and representatives of the Länder were involved in the critical areas. Therefore, the Austrian RTI strategy is an expression of a consistent, **evidence-based and interactive policy process**. The preparation process resulted in a common resolution of the government. The **jointly defined objective** for Austria: Becoming an *Innovation Leader* (see Box 5, page 17).

Overall, the RTI strategy follows a **systemic approach** in which the attainment of the objective is supported by various interactively coordinated measures (school education; promotion of talents; increase acceptance of RTI themes in society; integration and gender issues; financing and financial assistance structures, etc.). The term innovation is used as an

open concept and also covers social and organisational processes. This broad view matches the requirements of a mature, internationally-networked national system of innovation.

Creating incentives for private R&D investment

The principal aim is to significantly increase the R&D ratio to 3.76% by 2020.¹³ In this context, Austria relies heavily on the R&D activities of businesses and the leverage effect of investments by the public sector as an important prerequisite for Austria’s competitiveness and international appeal as a business location. The strategy dedicates a separate section to the goal of achieving at least two-thirds private-sector RTI financing.

The **specific design** of the instruments and programmes is done at the operational level by the competent ministries or agencies (see page 20 “The Strategy as a Process”).

12 www.bmwf.gv.at/forschungsdialog

13 The 2014 revision of the European System of National and Regional Accounts must also be taken accordingly into account.

Box 5: Becoming an Innovation Leader. Realising Potentials, Increasing Dynamics, Creating the Future”- RTI Strategy of the Federal Government

(Resolution adopted by the Austrian Council of Ministers of 8 March 2011)

BKA/BMF/BMWF/BMVIT/BMWFJ/ BMUKK¹⁴

DE: <http://www.bka.gv.at/DocView.axd?CobId=42655>

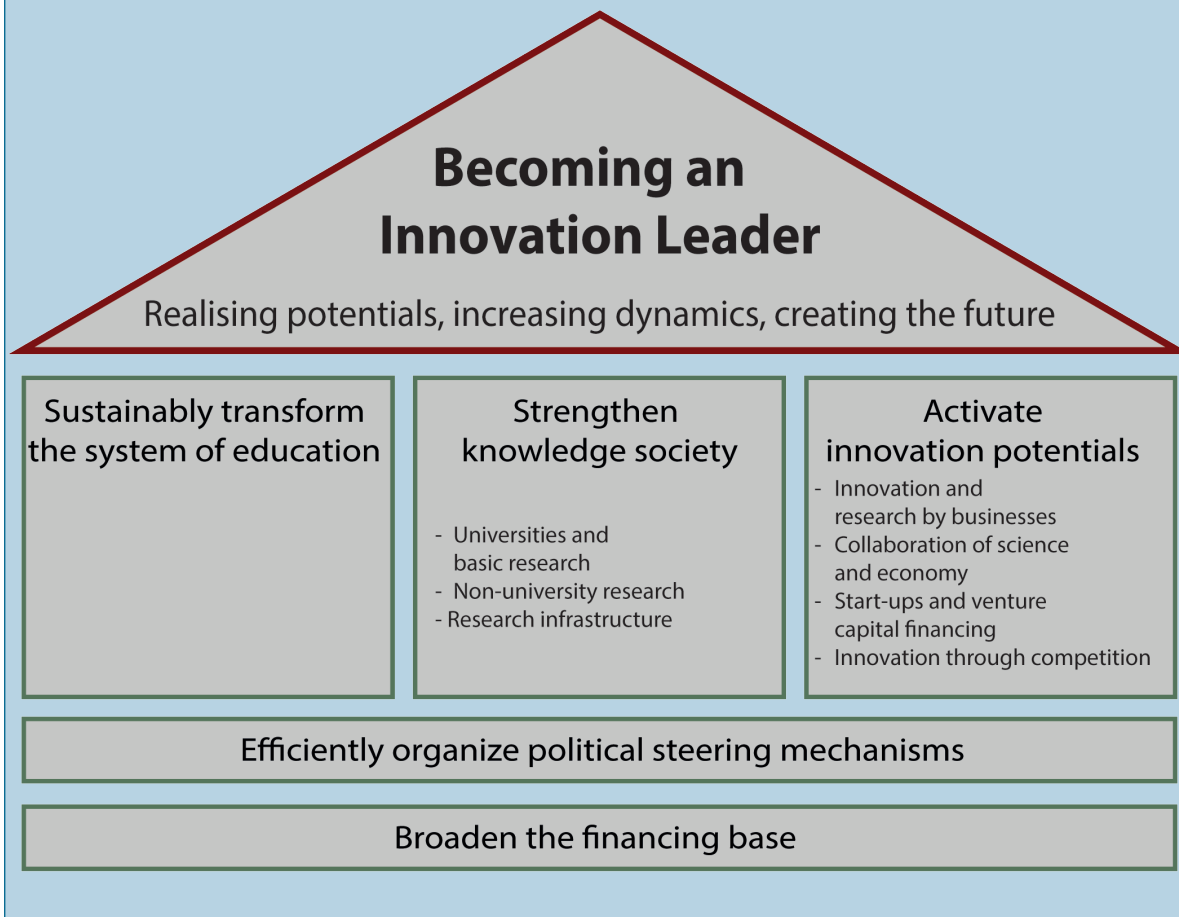
EN: http://www.era.gv.at/attach/Broschuere_FTI_Englisch_WEB.pdf

Technology frontrunner & innovation leader

“We want to develop the potentials of science, research, technology and innovation in Austria to turn our country into one of the most innovative ones in the EU by 2020 and in this manner strengthen the competitiveness of our economy and increase prosperity in our society.

We want to further develop the potentials of science, research, technology and innovation in Austria and apply these in their entirety to master the major social and economic challenges of the future.”

The objectives are, in particular, to substantially increase the R&D ratio to 3.76% by 2020¹⁵ and to achieve a private funding ratio of two thirds.¹⁶



¹⁴ BKA, Federal Chancellery/BMF, Ministry of Finance/BMWF, Ministry of Science and Research/BMVIT, Ministry for Transport, Innovation and Technology/BMWFJ, Ministry of Economy, Family and Youth/ BMUKK, Ministry of Education, Arts and Culture

¹⁵ The 2014 revision of the European System of National and Regional Accounts must also be taken accordingly into account, which has rendered the attainment of the ratios a more ambitious goal (Research and Technology Report 2014).

¹⁶ Further quantified objectives for innovation and research in the business sector as well as start-ups are: “The number of companies engaged systematically in research and development is to be lifted from an estimated level of around 2,700 in 2010 to a total of around 10% by 2013, and by 2020, to a total of around 25%”. “The number of knowledge and research-intensive start-ups is to be raised annually by an average of 3% by 2020.”

Policy mix and thematic focus of financial assistance for research

In line with the transformation of innovation policy, the instruments used are strongly oriented on **structural problems** such as to improve cooperation between science and business, the creation of critical mass, accelerate the dynamic of start-ups and growth, and increase the number of businesses engaged in R&D and innovation. In this context, the diversified economic structures and the strong focus of companies on niches are taken into account. Research shows that it is especially the “frontrunner companies” in Austria who pursue “niche strategies” with the ambition of becoming technology and market leaders in their respective segments. These frontrunner companies reflect the diversity of the economic and research structures.¹⁷

Predominant in this context are the **thematically-open programmes**. The COMET Programme (Competence Centers for Excellent Technologies)¹⁸ plays a key role. Its diverse programming lines are focused on establishing strategically-networked research structures at the interface between science and the economy. By applying a technologically-open bottom-up approach to the financial assistance programmes, the centres mirror the special (regional) strengths. COMET Centers are therefore the anchor points for regional specialisation strategies. The COMET Programme has its own programming line which helps to identify new and promising thematic areas through the so-called “K projects”¹⁹.

The thematically-open programmes for **businesses** have the aim of boosting R&D activities of companies in general, increasing the number of companies engaged in R&D and innovation as well as supporting the development of technology leaders across all industries. This technologically-open approach to financial assistance takes into account the fact that scientific innovation, trends and specialisations emerge from existing research environments or are adopted and implemented in such settings.²⁰

Box 6: Thematically-open horizontal objectives RTI strategy – a selection

The RTI strategy of the federal government defines thematically-open objectives for innovation and research by companies as well as for collaboration between science and business:

- To broaden the innovation base for companies engaged in research and systematic innovation.
- To improve product and services structures by increasing knowledge and innovation intensity.
- To heighten cooperation intensity among Austrian companies and to strengthen the strategic cooperation between science and business.
- To reduce barriers and inhibitions in the business sector regarding cooperation projects with science and research, and make access to external resources easier for companies.
- To raise the number of companies which are technology leaders and hold leading positions in innovation (frontrunners).

The federal government and also the Länder develop programmes aligned with these objectives and eligible for European co-financing.

Thematic priorities

The RTI strategy of the federal government establishes the thematic priorities for the period until 2020 that form an important framework for the definition of areas of strength oriented on social and economic challenges or for which strategies for industry clusters are developed and implemented on the basis of the RTI strategy. Notwithstanding the promotion of excellence at research institutions, investments in infrastructure and initiatives to support innovation (e.g. innovation for services and tourism – see below), the following thematic priorities – in the meaning of Smart Specialisation – have been defined for the period until 2020:²¹

- Information and communications technologies
- Life sciences

17 Austria and its regions as a business location have proven relatively resilient during the economic turbulence of the past few years. Apart from the stable macroeconomic framework conditions, the factors that contributed to this resilience were the swift response by the state to the financial and economic crisis, but also a diversified industrial core with a good competitive position in niche markets.

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

19 K-centres see https://www.ffg.at/sites/default/files/downloads/01_call_guide_k1-centres_4call_2015_en_final_0.pdf

20 The promotion of technology-open individual projects in the meaning of the FFG basic research programmes help to align the overall technological transformation with market trends: market processes and implied effects such as the efficient allocation of scarce resources are inherent to this approach. A further important benefit is perceived especially in the broad effect of this type of financial assistance, because funding for individual projects is done irrespective of their technological orientation and industry, and thus goes primarily to those companies (SME and knowledge-based service companies) confronted with specific barriers that make it difficult for them to initiate R&D activities or expand their current R&D activities (Schibany and Jörg 2005)

21 See Report on Research and Technology 2016 page 80 et seq.

- Materials sciences and intelligent manufacturing
- Bio-economy and sustainability
- Climate change, energy use and dealing with scarce resources
- Intellectual, social and cultural sciences (including social innovation)
- Securing the quality of life in view of demographic change (including urbanisation, mobility and migration)

The theme of mobility should be understood as inclusive, both with respect to technology development and new mobility solutions and concepts. Therefore, a thematic programming priority will be implemented within the FFG²² in applied research. The thematic priorities are supportive of scientific research, applied research and innovation.²³

Therefore, sector strategies are being developed or will be developed (e.g. strategy for the future Austria as a location for life sciences and medicine, FTI strategy for bio-based industries in Austria, strategic further development of the humanities, cultural and social sciences, open innovation strategy). The themes defined are accessible for all regions and institutions in Austria.

Services innovation and tourism

The promotion of innovative services, the creative industries and tourism plays a special role. Innovative services and the creative industries are supported by separate programmes and organisations (e.g. Kreativwirtschaft Austria <http://www.kreativwirtschaft.at/> and Austria Wirtschaftsservice – Bereich Kreativwirtschaft: <http://www.awsg.at>). Moreover, a specific positioning is being developed for tourism within the scope of a management process (<http://www.bmwfw.gv.at/Tourismus/Seiten/Tourismusstrategie.aspx>). In this case, the paradigms of higher quality and (service) innovation have replaced those of capacity expansion.²⁴

Budgetary scope

Federal level

The federal government's decision to adopt the RTI strategy is a declaration to provide financing for RTI measures in accordance with the strategy for a multi-year period. Within this scope, the competent ministries for research, technology development and innovation have a budget and commission agencies with the execution of financial assistance programmes.

Spending on R&D by the federal government and the Länder will amount to around EUR 3.7 billion in 2016 (ca. 35% of total R&D spending) according to estimates by Statistik Austria. The share of the federal government accounts for around 87%.²⁵

As a consequence of the increase in public and private R&D funding, the R&D ratio, which had been only 1.45% in 1993, rose to over 3% by 2014. This level has been maintained ever since despite some minor fluctuations. From 2014 to 2016, government spending on R&D increased by 4.8% according to current estimates. Corporate spending on R&D increased in the same period by 7.7%. At a GDP growth rate of around 6.1% in the same period, this results in a stable R&D ratio which is forecast to rise to 3.07% in 2016.²⁶

The table below shows the medium-term financial framework for the funding of research and development in Austria until 2020.

The federal agencies received the funds set out below from the federal budget in 2016 which are also included in the figures given in Table 1 (spending for R&D funding by the federal government 2016 to 2020):²⁷

- Fund for the promotion of scientific research (Fonds zur Förderung der wissenschaftlichen Forschung): EUR 184.2 million.

22 FFG, Austrian Research Promotion Agency

23 In this context, please refer to the thematic priority programmes for applied research of the Austrian Research Promotion Agency (Forschungsförderungsgesellschaft (<https://www.ffg.at/>): Life sciences, information technology, materials and manufacturing, energy and environment, mobility, service innovations.

24 Apart from marketing, suitable funding schemes, infrastructure and design of right framework conditions, innovation is also defined as a success factor.

25 Statistik Austria 2016 - Global Estimate 2016: gross domestic expenditure for R&D

26 Calculations based on the Global Estimate 2016 of Statistik Austria.

27 Source: R&D Annex – Overview pursuant to 42 para. 4 no. 5 Federal Budget Act 2013, December 2015

Table 1: Spending on R&D by the federal government 2016 to 2020

Medium-term budget volumes in EUR millions ²⁸	2016	2017	2018	2019	2020
Science and research	4,283.3	4,315.0	4,401.3	4,421.9	4,443.8
Applied research (economy, innovation and technology)	529.7	529.7	529.7	529.7	529.7

Source: Strategy Report on the Financial Budget Act of the Federal Government 2017 to 2020

- Fund for the promotion of research (Forschungsförderungsfonds): EUR 335.7 million
- Climate and energy fund (Klima- und Energiefonds): EUR 22.9 million

Furthermore, Austria Wirtschaftsservice GmbH (aws) spent EUR 27.14 million in subsidies for technology promotion and EUR 14.3 million on funding for start-ups in the year 2015.²⁹

R&D spending by the Länder

Spending by the Länder has risen steadily over the past years and now stands at EUR 478 million.³⁰

The budget data dealt with in this section focus on R&D expenditure. The data comprises only part of the financial resources made available for the implementation of the RIS3 strategies discussed in this document. To this, one must add the funds earmarked by the federal government and the Länder for financial assistance for innovation.

The strategy as a process: operationalisation, monitoring and evaluation

The **operationalisation** and concrete design of the instruments and programmes of the RTI strategy is the responsibility of the competent ministries and agencies.

- The **coordination** and the related overall monitoring of implementation of the strategy are managed by the Department for Research Coordination of the Federal Chancellery.
- An inter-ministerial “**RTI Task Force**” was established for the management and operationalisation of strategy implementation at the highest official level supported by thematically-specific **Working Groups** (e.g. on themes such as research infrastructure, internationalisation and RTI exter-

nal policy or climate change/scarcie resources)³¹. Within the work of the Task Force for the implementation of the RTI strategy and in its working groups, targeted priorities are defined based on the central problem areas to be able to identify the strengths and weaknesses of the structural transformation and thus derive concrete recommendations for actions and their implementation.

- The **Council for Research, Technology Development and Innovation** (*Rat für Forschung, Technologieentwicklung und Innovation*) was commissioned in 2010 by the government to monitor strategy implementation. To this end, the Council for Research, Technology Development and Innovation prepares an annual report on Austria’s capacity potential in science and technology³². The progress of strategy implementation is monitored using an extensive set of indicators assigned to each of the objectives.
- The federal government prepares a **Research and Technology Report** every year. The two reports mentioned are brought to the attention of Parliament.
- The principle of effective **budget management** implies a stronger focus of the guidelines on the content of the objectives and the indicators. Thus, a written **evaluation concept** is prepared for each financial assistance programme and measure that is based on the RTI Guidelines. For the purpose of recording the required information, adequate monitoring must be set up that delivers standardised basic data for the life of the project.
- **Evaluation culture** is therefore highly developed in Austria. A separate platform for research and technology evaluation has been established – fteval (<http://www.fteval.at>) and the persons responsible for RTI policy and the evaluators are represented on this platform. In the past, evaluations have often served as the starting point for critical RTI policy changes.

28 Subgroup 31 Science and Research;

Applied Research = Subgroup 33 Economy (research) and 34 Transportation, Innovation and Technology (Research)

29 To this, EUR 825.6 million must be added in financial assistance via equity investments, guarantees, loans and grants; Austrian Report on Research and Technology (Österreichischer Forschungs- und Technologiebericht) 2016

30 Estimates of the Land governments for R&D spending as basis for the annual R&D Global Estimate of the Austrian National Statistics Office.

31 bka.gv.at/site/7463/default.aspx

32 www.rat-fte.at/leistungsberichte.html

Box 7: Mid-term Report on the RTI strategy of the federal government³³

After five years of implementation of the RTI strategy of the federal government, a mid-term report was prepared to reflect on the implementation process and the framework conditions of RTI strategy implementation to date. According to the report, the RTI strategy has become established as an important long-term and common framework for policymakers and administration bodies. The RTI strategy's broad and systemic perspective has also helped to improve the coordination of themes of RTI relevance among the different levels of competence. At the same time, the framework conditions for the implementation of the RTI strategy have changed – especially due to the sustained phase of economic weakness as a consequence of the financial and economic crisis of 2008. Due to this “structural disruption”, the ambitious goals defined in the RTI strategies soon faced budgetary constraints, which in turn caused a shift in priorities and changes to the portfolio of the measures – a situation that has lasted to this very day.³⁴

As regards the objective of increasing R&D intensity to 3.76%, progress has been achieved as revealed by the fact that the 3% mark was surpassed for the first time in 2014. Overall, however, the attainment of the objectives has become increasingly unlikely due to the flattening of the dynamic growth of the years 1995 to 2007, a trend that started with the economic and financial crisis in 2008.

Spending by the public sector has surpassed the “targeted trajectory”. Accordingly, the greatest challenge to the attainment of the target lies mainly in the endeavour to raise R&D intensity in the private sector. Many measures of the RTI strategy of the federal government are therefore designed as incentives and support for the private sector in order to attain this higher level of R&D in the business sector. If this fails, or is not achieved to a sufficient degree, it seems very unlikely that the targeted ratio will be achieved.³⁵

Coordination federal government/Länder

The **strategic coordination** for each of the specific themes takes place using information and exchange forums:

- Mutual bilateral **participation in strategy development**, especially by federal organisations in the regional RTI strategy processes in order to take account of the overarching strategies.
- The “**Bundesländerdialog**” – the policy platform for national and regional governments and agencies in science, research and innovation” set up by the Federal Ministry of Science, Research and Economy is the established platform of the federal government and Länder for the exchange of information in the areas of science and research, and enlarged by the inclusion of a group of stakeholder organisations. The platform “Bundesländerdialog” creates the basis for the ministries and the Länder to coordinate their policies more closely and define the themes.³⁶

- The “**Platform RTI Austria**” (*Plattform FTI-Österreich*) set up by the Council for Research and Technology Development meets twice a year and serves as an information hub for the Länder and the agencies for the financial assistance schemes for all areas of the innovation system. Its meetings alternate and are coordinated with the meetings of the “Bundesländerdialog”.
- The federal government and the Länder coordinate their structural policies within the scope of the **Austrian Conference for Spatial Planning** (*Österreichische Raumordnungskonferenz*).³⁷
- At the **instruments level**, important RTI policy instruments are funded jointly by the federal government and Länder (e.g. **COMET Programme**) or are co-financed by the Länder (e.g. financial assistance for enterprise R&D projects). The exchange of information and coordination is also supported within the **Cluster Platform**.³⁸

The role of universities as **leading regional institutions**³⁹ is being given more attention in location deve-

33 See bmwfw/bmvit, Austrian Research and Technology Report (Österreichischer Forschungs- und Technologiebericht) 2016

34 Austrian Research and Technology Report (Österreichischer Forschungs- und Technologiebericht) 2016, p. 42 f. and p. 90.

35 Austrian Research and Technology Report (Österreichischer Forschungs- und Technologiebericht) 2016, p. 90.

36 www.bmwfw.gv.at/bundeslaenderdialog

37 In 2016, the concept of “Smart Specialisation” was discussed within the scope of the STRATAT 2020 Partnership “Smart Specialisation”; the outcome is this paper on the “Policy Framework for Smart Specialisation in Austria”.

38 www.clusterplattform.at

39 The concept of “Leading Institutions” is an intentional analogy to the established concept of “Leading Companies” used in Austria to refer to the top firms in specific industries who are aware of their responsibility for creating value added and jobs at their locations.

lopment. Public universities have three-year **performance agreements** that are rolled over and renewed. In the three consecutive performance agreements (2013-2021) and in the **overall university development plan 2016-2021**⁴⁰, the Ministry for Science, Research and the Economy calls on universities to coordinate their activities with a view to developing

competitive knowledge locations and to proactively exploit their potential as **leading regional institutions**. A report drafted by experts on behalf of the European Commission (2014) recommends that Austria's leading institutions initiative be used as a "smart policy scheme" for the implementation of Smart Specialisation.⁴¹

40 [wissenschaft.bmfwf.gv.at/fileadmin/user_upload/wissenschaft/publikationen/2015_goe_UEP-Lang.pdf](https://www.wissenschaft.bmfwf.gv.at/fileadmin/user_upload/wissenschaft/publikationen/2015_goe_UEP-Lang.pdf)

41 ec.europa.eu/research/regions/pdf/publications/ExpertReport-Universities_and_Smart_Spec-WebPublication-A4.pdf

RTI STRATEGIES OF THE LÄNDER

Multi-level governance

Austria is a federal state and the regions – in this case, the *Länder* – have autonomous, elected political representatives and budgets. The RTI strategy of the federal government serves as guidance in this context. **Learning** from each other and together is of key importance for the system. The **location profiles** are differentiated by the **regional priorities defined by the *Länder***.

Austria started pursuing a territorial policy approach very early and this can be seen in the development schemes from the 1980s based on endogenous renewal. After it joined the EU in 1995, innovation was increasingly integrated into these schemes and from the mid-2000s onwards, the schemes started focusing more and more on research and innovation.

Encouraged not least by the **EU programming cycles** and the related programmatic work as well as in connection with the growing strategic orientation of the interventions, the *Länder* started developing development strategies in the 1990s. Starting in 2000, the

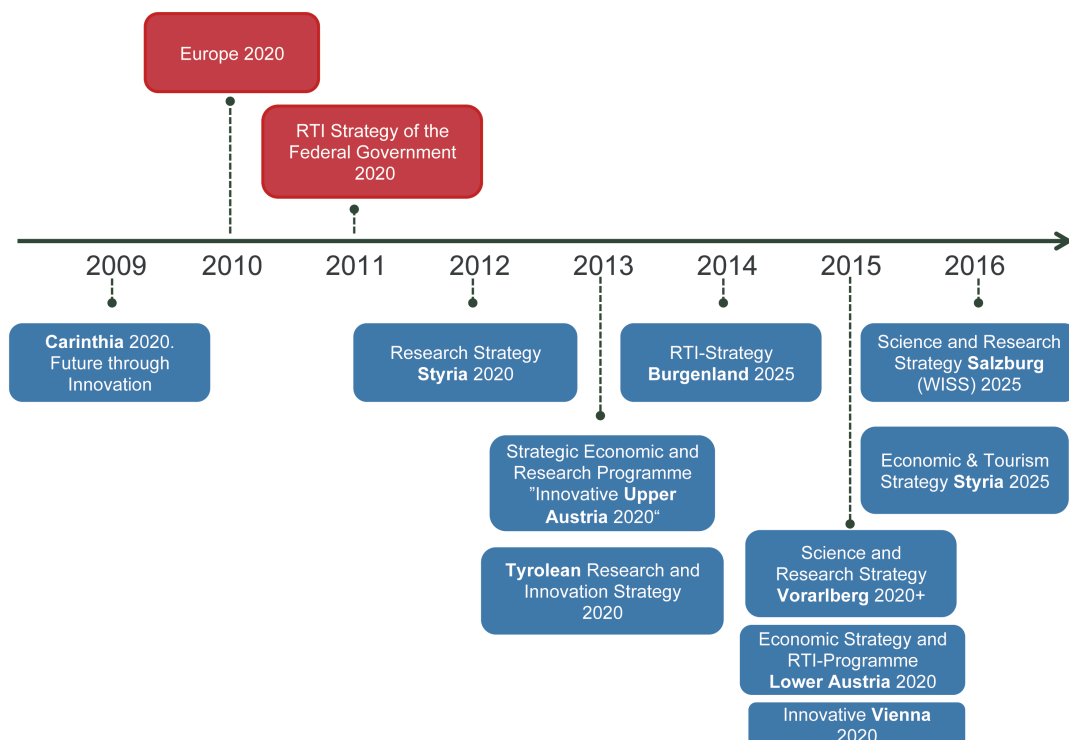
strategies started to shift from general economic strategies towards research and innovation strategies. Today, all *Länder* have concepts for economic and innovation or research policy **schemes**. These take into account the overarching EU and national policies and the specific strengths of the regions. The specific forms, design, planning timeframe and content take guidance from the regional situation.

As the *Länder* schemes are **cyclically reviewed with a time delay**, the *Länder* have the possibility of exchanging views among each other and with the federal government, thus supporting a **learning process** among the *Länder*. The review intervals are gradually starting to coincide more and more with the periods defined by the EU financial framework.

Interactive strategy development – entrepreneurial discovery

Austria features a highly developed culture of **stakeholder inclusion in planning processes** and a long-

Figure 1: RTI strategies in Austria



Source: Federal Chancellery, Offices of the Governments of the Länder, own research

Box 8: RTI and economic strategies of the *Länder* in the context of smart specialisation

- FTI Strategy Burgenland (*FTI-Strategie Burgenland*) (2014)
- FTI Strategy Carinthia 2020 Future through Innovation (*FTI-Strategie Kärnten 2020 Zukunft durch Innovation*) (2009)⁴²
- Economic Strategy Lower Austria 2020 (*Wirtschaftsstrategie Niederösterreich 2020*) (2014)⁴³
- Strategic economic and research programme “Innovative Upper Austria 2020” (*Strategisches Wirtschafts- und Forschungsprogramm Innovatives OÖ 2020*) (2013)
- Science and Innovation Strategy Salzburg 2025 (*Wissenschafts- und Innovationsstrategie Salzburg 2025*) (2016)⁴⁴
- Economic and tourism strategy for Styria 2025 Growth through Innovation (*Wirtschafts- und Tourismusstrategie Steiermark 2025 Wachstum durch Innovation*) (2016)⁴⁵
- Tyrolean research and innovation strategy (*Tiroler Forschungs- und Innovationsstrategie*) (2013)
- Science and Research Strategy Vorarlberg 2020+ (*Wissenschafts- und Forschungsstrategie Vorarlberg 2020+*) (2015)⁴⁶
- Viennese Strategy for Research, Technology and Innovation – Innovative Vienna 2020 (*Wiener Strategie für Forschung, Technologie und Innovation – Innovatives Wien 2020*) (2015)

standing broad consensus between politics, business and society as well as between the national and regional actors with respect to investments in science, research, technology and innovation. The strategies are defined applying a top-down and bottom-up logic by considering the overarching policy framework and the location analyses, especially with respect to fields in which Austria is capable of keeping pace internationally and staying competitive. The strategies are defined by the federal government and the *Länder* within the scope of an interactive discussion process with the inclusion of the economic and social partners, the business sector and institutional stakehol-

ders. The strategies and the location-specific thematic fields are guided by the strengths and the promising areas of a region that enjoy the common support of the local actors.

Fundamental orientation of the *Länder* strategies

Apart from the **thematic priorities** defined, the strategies of the *Länder* follow the **fundamental orientation** set out below:

- **Joint financing of programmes**, such as the CO-MET programme (see priority definitions). The bottom-up networking of science and business supports the orientation on special (regional) strengths and the centres reflect the specific regional specialisations in science and business.
- The structures that emerge from the federal programmes (which aim for excellence as a goal in itself and do not pursue any regional policy aspects) are supplemented in order to **improve their regional integration into existing location systems** (e.g. collaboration with universities to create professorships based on grants for specific priority themes).
- The **innovation basis** of companies is broadened in a thematically open manner to integrate more companies into research and development, and into systematic innovation processes.
- The **cluster concept** plays an important role especially at the regional level and has proven a robust economic policy instrument since the 1990s. The significance of clusters has changed over time, from industry-dominated associations built along value chains towards networks with specific profiles, joint R&D and innovation. Therefore, clusters are a key instrument for the development of strategies the regional Smart Specialisation.⁴⁷

Strategic definition of priorities and themes

The locational profile in Austria is ultimately differentiated by the locational strategies and profiles developed at the *Länder* level. Financial assistance for location and project development is distributed by **thematic area** for which priorities have been defined within the regional innovation system or for which deficits have been recognized.

42 Furthermore: *Wirtschaftsstrategie für Kärnten 2013 – 2020*.

43 Additionally, in the context of Smart Specialisation, the FTI strategy and the FTI programme of the Land of Lower Austria must be mentioned www.noel.gv.at/Bildung/Wissenschaft-Forschung/FTI-Strategie.html. There is an overlap in the area of regional technology policy where the two strategies are aligned with each other.

44 Furthermore: the economic strategy “*Wirtschaftsprogramm Salzburg 2020*. Salzburg. Standort Zukunft.” (2011).

45 With respect to institutional research and basic research, the research strategy “*Forschungsstrategie Steiermark 2020*” (2012) must be mentioned.

46 Furthermore: *Wirtschaftsleitbild Vorarlberg 2010+ - Update 2014* (2014)

47 See AIT/JR/IHS; WIFO/ZSI Stärkefelder im Innovationssystem: *Wissenschaftliche Profilbildung und wirtschaftliche Synergien* (2015) p. 104

Figure 2: Länder priorities corresponding to the federal nation-wide themes

THEMES	Burgenland	Carinthia	Lower Austria*	Upper Austria	Salzburg	Styria*	Tyrol	Vorarlberg	Vienna
Information and Communications Technology									
Life Sciences									
Materials Sciences									
Production Technology									
Sustainability									
Energy, Climate Change, Resources									
Mobility									
Quality of Life and Demography						**			
Humanities, Social and Cultural Sciences			**			**			
Creative Industries, Service Innovations									
Tourism (as part of the RTI Strategy)									
Tourism (separate tourism strategy)									

Bio-economy is an inter-sectoral theme and is found in sustainability, life sciences and materials sciences.

*	Economic strategy as a basis for smart specialisation
**	Complementary priority area in the research strategy of the respective Land
	strong
	low
	hardly/not at all

Source: Strategy documents of the Länder, own research

The regional strategies are defined in accordance with the **thematic priorities** specific to a location targeted for promotion and development. The goal is to build up competencies and institutions that can become part of national and international programmes, and at the same time, can be integrated into international value chains presently and over the longer term.

The following table presents an overview of the regional thematic priorities and their correspondence with the national thematic priorities.

Furthermore, all of the *Länder* have a corresponding **regional tourism strategy**, which defines the target groups, marketing and services offered and is aligned with the relevant the national strategies.

Use of ERDF funds within the strategies

The funds of the European Regional Development Fund (ERDF) (annually around **EUR 28 million**) are used for **Objective 1 theme “Strengthening Research, Technological Development and Innovation”** – aligned with the RTI strategies – to strengthen the location-specific R&I capacities **along the regional strengths and thematic fields**. New research structures have been built up in the past at the junction of science and economy as competence centres by national measures and in some cases with the support of EU funding. However, the process of systematically deepening the territorial systems of infrastructure and services through the expansion of specific research competencies has not yet been completed. Existing structures are to be complemented by specific research infrastructure and competencies in order to attain a critical mass and rise to the standard of the national and interna-

Box 9: Examples of the regional variants of RTI policy themes

- ICT in Carinthia with a focus on “self-organising systems” and robotics
- Regional priorities in agricultural and food technology in Lower Austria
- Smart textiles (within the priority on materials) for Vorarlberg
- Ecological and energy-efficient building and renovation in Salzburg, Lower Austria, Burgenland, Vienna and Styria
- “Alpine region” in connection with climate change in the RTI scheme for Tyrol
- Mobility technologies in Styria and Upper Austria
- Creative industries in Tyrol, Vienna, Salzburg and Styria
- Tourism & innovation in Salzburg and Tyrol with a high tourism intensity

tional programmes. Together with research institutions, a local “innovation eco-system” of high-intensity R&D companies, start-ups, and research and educational institutions that interact closely with each another is to be created. In regions with less research activity, attention focuses on easily accessible measures and transfer mechanisms (e.g. Burgenland, Salzburg), while in R&D-intensive regions with a strong institutional setting, the aim is to achieve regional integration, a broader base and the establishment of internationally prominent infrastructures. Additionally, in line with the FTI strategies of the federal government and of the *Länder*, the aim is **broaden the innovation basis** and ex-

pand R&D and innovation capacities at companies. As a horizontal approach and therefore not limited to any specific theme, the IGJ/ERDF⁴⁸ programme aims to strengthen R&D and innovation activities at companies. This is achieved by integrating companies into the innovation and R&D process (“newcomers”) or by increasing or professionalising existing innovation activities (e.g. join more systematic R&D and innovation activities or achieve new levels of quality in R&D activities, e.g., through regional co-operation projects). Financial assistance schemes for start-ups that concentrate on innovative, knowledge-based businesses and encouraging their growth is a means to this end. At the same time, companies are also supported that stand “at the edge of the technology fields”. The purpose here is to accelerate the transition of R&D findings into **marketable and efficient products/processes**, and to make riskier projects feasible.

Framework conditions for implementing the strategies of the *Länder*

Spending by the *Länder* has risen steadily over the past years and is estimated to rise to around EUR 478 million in 2016.⁴⁹

Support for strategy implementation is usually available from the competent offices of the *Länder* and from the dedicated **promotion agencies** and also in the form of FTI-related **instruments**. The competent **Land governments** are responsible for the relevant strategies. Apart from the competent bodies of the *Länder*, the services of outsourced **agencies** are also

used (e.g. ecoplus Lower Austria’s business agency, Business Upper Austria, Wirtschaftsstandort Vorarlberg, FTI-Burgenland, Steirische Wirtschaftsförderungsgesellschaft mbH, Standortagentur Tirol, Kärntner Wirtschaftsförderungsfonds, Vienna Business Agency) to deal with the issues of location development and for the payment of the funds under the regional financial assistance schemes.

Today, **RTI concepts** are usually interpreted dynamically. Generally, there are monitoring and implementation processes to translate the often very broadly worded strategies into concrete terms and operationalise them (e.g. in the form of working programmes). The strategies are reviewed in regular intervals. All *Länder* regularly produce reports within the framework of the economic, location and innovation reports. In this context, a few processes are mentioned as example.

- The ongoing dialogue regarding location issues by the economic and social partners with a view to the further development of the strategies and evaluation work for the strategy in Styria.
- An ongoing reflection process and operationalisation within the steering groups in conjunction with ongoing evaluations of *Technologiefonds Kärnten*.
- A very advanced monitoring and evaluation set of instruments within the framework of the balanced score card model in Lower Austria which has been recognized by the S3 Platform as a “success story”.
- Ongoing strategy monitoring and evaluation in Upper Austria and Vienna.

Table 2: Strategy Implementation, Monitoring, Evaluation in the *Länder*

	Burgenland	Carinthia	Lower Austria	Upper Austria	Salzburg	Styria	Tyrol	Vorarlberg	Vienna
Operationalisation, Implementation	Annual, rolling planning	RTI Strategy group, operationalised in sets of measures	Within the scope of the BSC process and RTI programme	Control and steering cycle at the programme and <i>Land</i> level	Project group for implementation and process control	Thematic cluster strategies, reflection within the location dialogue Styria	Implementation is done in concrete working programme	Steering group	Annual working programme, internal municipal body
Advisory body	Planned: Burgenland Council for Research a. Technology Development	Economic policy and Advisory Council for Science	Steering group, cooperation with the Council for Research a. Technology Development of the federal government	Council for Research and Technology Development for Upper Austria	Council for Science and Research	Research Council for Styria	Planned: Research Council	Advisory Council for Science	Extended Advisory Council
Evaluation	Annual monitoring planned, rolling planning	Regular evaluation of the Carinthia Technology Fund	Within the scope of the BSC process	Interim evaluation 2016	Evaluation within the frame 2018-2022 planned	Evaluation of core strategies & programmes	Evaluation at mid-term to prepare the follow-up strategy	Evaluation planned for 2018 and 2021	Evaluation 2018/19

Source: Office of the Provincial Governments of *Länder*, own research

48 IGJ, Investment for growth and jobs (IWB, Investitionen in Wachstum und Beschäftigung)

Operational Programme "Growth and Jobs"; ERDF, European Fund for Regional Development

49 Estimates of the Land government for R&D spending as basis for the annual R&D Global Estimate of ST.AT.

→ Annual reflection processes for implementing the strategy and making the necessary adjustments (e.g. Burgenland, Tyrol, Carinthia, Styria, Upper Austria).

These processes are usually supported by monitoring **bodies with an advisory function**, “advisory councils” or “research and innovation councils,” which are composed of experts from science, education and business. Styria, Carinthia, Upper Austria, Salzburg, Vorarlberg have their own advisory councils, and there plans to set up such bodies in Tyrol and Burgenland. Lower Austria cooperates with the Council for Research and Technology Development at the federal level. Furthermore, the economic and social partners are also frequently integrated into the regional agencies with a supporting function.

Strategies of the *Länder* and their priorities: an overview

The following section presents the regional **strategy priorities** of the *Länder* defined within this framework. The breakdown of this *Länder* presentation follows the structural economic priorities of the regions:

Service-oriented metropolitan region

Vienna as a metropolitan region is the location of the headquarters of multiregional Austrian companies with the respective dispositive functions and features a high concentration of research and development activities. Based on the first RTI strategy “Vienna - Thinking the Future” (*Wien denkt Zukunft*) (2008) and the framework strategy “Smart City Vienna” (Smart City Wien) adopted in 2014, the strategy “Innovatives Wien 2020” (Innovative Vienna 2020) was prepared in a broad, inclusive process and adopted in 2015. The framework strategy “Smart City Vienna” defined the two goals of positioning Vienna as one of the top five research centres of Europe by 2050 and taking advantage of the innovation triangle Vienna-Brno-Bratislava as one of the most promising regions in Europe. The purpose is to target and further develop the RTI strong points: life sciences, ICT, creative industries, humanities, cultural and social sciences, and certain areas of mathematics/physics. The objectives defined in the RTI strategy follow a generally systemic approach. From the standpoint of a metropolitan area, the objectives refer primarily to future challenges that affect the city or region as a whole and require comprehensive systemic solutions, a circumstance also reflected in the objectives: Vienna as a city of opportunities with an innovative city administration, and Vienna as a place of encounters. Innovation has been intentionally conceptualised broadly, and as regards open innovation, the participation of the demand side in innovation processes plays a key role.

The implementation of the RTI strategy is defined in the annual working programmes.

Regions with a strong industrial base

Carinthia is working on the creation of a regional, thematically-specialised innovation system. With the expansion of the institutional innovation system, especially the research activities of leading companies, the regional R&D ratio was lifted from below 1% to 2.83%. In this context, a strategy is being pursued of embedding the Carinthian system of innovation into the Alpe Adria region (cooperation projects). The RTI strategy “*Kärnten 2020 - Zukunft durch Innovation*” adopted already in 2009 and complemented by the economic strategy for Carinthia 2013 to 2020, addresses the three areas of the knowledge triangle: education (strengthen Carinthian universities), research (intensify cooperation between science and business) and innovation (broaden the innovation base in Carinthian). Research and innovation capacities are to be strengthened with the help of endowed professorships and specialised research clusters along the priority themes, especially in the area of higher education. Apart from the thematically-open mobilisation of R&D and the promotion of the innovation capacities of all companies with potential, a focus is placed on information and communication technologies (self-controlled, networked systems), sustainability technologies and materials (renewable resources and ICT synergy priorities like smart energy, control technologies, energy efficiency) and production technologies at the interfaces of IT, control technology and module switching technology (Industry 4.0). To develop the corresponding locations with international appeal in the central areas, the infrastructures needed for a new generation of science and technology parks are set up.

Lower Austria began the reorientation of its regional innovation policy when it started participating in the EU RIS Initiative and has stayed on this course of international exchange activities over the past one-and-a-half decades. The implementation of the strands “Innovation & Technology” are defined in Lower Austria’s innovation pyramid. The technology and innovation partnership serves as basis and is aimed at mobilizing existing innovation potential to support (all) companies with potential, strengthen their competitiveness through innovation, and achieve modernisation and structural change, for example, through new key technologies. Clusters are created to initiate – thematically-focused – leading cooperative and international R&D projects in the fields of the future. With the creation of technopoles, location development follows clearly-defined technology fields at the confluence of science, economy and higher education. The aims are to achieve critical

mass, international visibility and location development. In accordance with this concept, thematic areas of specialisation are created within the clusters. Currently defined areas: environmentally-benign construction, food, plastics and mechatronics. The priorities at the technopoles for research which concentrate on excellence and critical mass are on medical biotechnology (Krems), agricultural and environmental technology (Tulln), bio-energy, agriculture and food technology (Wieselburg), and medical and materials technologies (Wiener Neustadt).

Upper Austria as an industrially-dominated Land has worked intensely in the past 25 years on a location policy to build up a specialised regional innovation system, and in this context, it has promoted mainly research and educational capacities. The strategic economic and research programme “*Innovatives OÖ 2020*” (“Innovative Upper Austria 2020”) consistently follows the innovation chain education-research-business, and pursues a productivity-oriented growth strategy. The four core strategies defined (location development, industrial market leadership, internationalisation, future technologies) were defined in an intensive discussion process that followed a top-down and bottom-up logic. Five fields of action were arrived at for the Land: (i) industrial production processes, (ii) energy, (iii) health and aging society, (iv) food and nutrition, and (v) mobility and logistics. For every action field, strategic priority objectives and goals were defined for education-research-business. Upper Austria, as a Demonstrator Region for Service Innovation (within the ESIC Initiative) has focused on innovation in services to accelerate the industrial renewal process and to achieve a higher level of competitiveness over the long term. The development strategy was monitored by the Council for Research and Technology for Upper Austria (*Rat für Forschung und Technologie für Oberösterreich, RFT OÖ*) and was adopted by the federal government and the Land parliament.

Styria is an industrially-dominated region with a research ratio of 4.8%, making it one of the most research-intensive regions of Austria. The innovation strategy in the meaning of intelligent specialisation is represented by the scheme “Economic and Tourism Strategy Styria 2025 – Growth through Innovation” (*Wirtschafts- und Tourismusstrategie Steiermark 2025 – Wachstum durch Innovation*). It is oriented on applied research and promotes the areas of confluence of science and business, especially through COMET Centres. The strategy of the Land Styria to promote science and research complements this objective and concentrates on the science system and thus also covers the relevant elements of basic research. Styria therefore pursues the ambitious goal of becoming a real benchmark for change for a knowledge-based production society in the EU. In this context, the aim

is to support innovation dynamic of the leading companies, integrate more companies into the innovation processes, and enlarge the focus to include services. The key market-driven themes are (i) mobility, (ii) green-tech, (iii) health-tech. These are supported by the core technology competencies: materials technology, production technology, machinery and plant engineering, digital technology and microelectronics. The creative industries are positioned as “innovation supporters”. In the collaboration of the actors in the clusters along the knowledge triangle, detailed strategies were defined for the key themes in an “entrepreneurial discovery process”.

Vorarlberg is one of the most strongly growing regions in Europe. The economy in Vorarlberg has an above average high rate of exports. Vorarlberg's strengths lie in its focus on applied research, which is conducted mostly at companies and is therefore guided directly by the needs and requirements of the market. This is also reflected in the fact that it has highest share of company-financed R&D spending in all of Austria. Vorarlberg has successfully mastered structural change in the past by overcoming the extreme domination of the textiles and garments industry, and transitioning towards metallurgy and the production of food and beverages. The strategic basis for its innovation and location policy is constituted by the economic guiding principles defined by the government of Vorarlberg (*Vorarlberg Wirtschaftsleitbild Vorarlberg*) (2014) and the science and research strategy for Vorarlberg 2020+ (*Wissenschafts- und Forschungsstrategie Vorarlberg 2020+*). In line with the core competencies of Vorarlberg's economy, the expansion of the financial assistance schemes for science and research concentrate in the following areas: smart textiles, energy and energy efficiency, humans and technology, education and health, intelligent production. The corresponding action fields of the two strategies are focused on the improvement of the innovation capacity of companies (advisory and support, innovation management), facilitation of access to financing instruments, promotion of entrepreneurial potential, promotion of cooperation and networks especially in the areas of education and qualification, especially with respect to energy and resource efficiency. A special focus is placed on the cross-border transfer of technology and knowledge (e.g. within the framework of the university association of the “International University of Lake Constance”).

Mixed economic structures: High focus on services with selective strengths in industrial production and research

Salzburg's principal concern is to further strengthen and expand the partly very heterogeneous and small-scale science and research structures in a targeted

and concentrated manner. Essential for “intelligent specialisation” is to make use of existing synergies and to avoid redundancies, to concentrate on attaining “critical mass” at the location based on the principle of “strengthening the strong points”, and to take guidance from the requirements of Salzburg’s economy and society when expanding the structural basis. The following five guiding principles of the Science and Innovation Strategy for Salzburg 2025 (WISS 2025), which was adopted in February 2016 by the Land parliament, pay due attention to this: 1. science, research and innovation are key competitive factors for Salzburg; 2. specialisation and cooperation are prerequisites for the further development of the regional innovation system; 3. success in science, research and innovation requires consistent internationalisation; 4. education, further education and career opportunities based on high standards; 5. governance for the strategic steering, implementation and evaluation opens new paths. The analysis and conceptual work done in an intense dialogue between science and business yielded five thematic fields with high potential for intelligent specialisation in Salzburg and the creation of critical mass there: (i) life sciences, (ii) ICT location Salzburg, (iii) smart materials, (iv) intelligent construction and settlement systems, (v) creative industries and innovation in services. This corresponds to Salzburg’s economic programme 2020: “Salzburg. Business Location - Future” (Salzburg. Standort Zukunft) (2011) whose objectives and measures specifically addresses the areas (i) “location development” along the knowledge triangle “economy-education-science” including a thematic profile, (ii) “corporate development” with a focus on entrepreneurial R&D and (iii) “governance”, among others, also with strategies to expand the system of regional innovation. For Salzburg, the aim is the specialisation of university and non-university research by bringing it closer to the needs of the business sector in the thematic priorities and the expansion of corporate innovation activity by systematically encouraging companies to engage in R&D.

Tyrol is characterised by a strong science sector (three universities, three specialised colleges and several research institutions). Entrepreneurial R&D is concentrated at a small number of larger companies with intensive research activity. The Alpine location and the related locational requirements (including climate change) and tourism shape the framework for problem-based research and innovation. The research and innovation strategy (2013) adopted by the Tyrolean Land government defines general guiding principles for the advancement of innovation and research at the location that is sustainable, forward-looking and competitive and supports the location’s priorities and strengths. Specific details of the R&D strategy are defined in a working programme. The following the-

mes have been defined as the thematic priorities: life sciences, materials and production (mechatronics, materials, especially timber), information technologies and also environment and energy (renewable energy source, Alpine region), wellness/tourism as well as the creative industries for the services sector.

Transitional region according to the definition of the Structural Funds: without own regional agglomerations

For geographic and historic reasons, and because it is a predominantly rural region without any agglomerations, **Burgenland** – as a former Objective 1 and now transitional region – scarcely has any research-intensive economic branches or industrial enterprises. Until 20 years ago, there were no research-linked, tertiary educational institutions or non-university research institutions. Since Austria’s accession to the EU, Burgenland has completed an impressive catching-up process with respect to infrastructure, economy and education. Its closeness to the central place of Vienna and the ties of its southern part to the region of Graz are the contact points that create access to research competence. With a view to the strengths of the innovation-driven development, the following strategy fields were defined: (i) raise awareness for RTI, (ii) increase human resources, (iii) enlarge research infrastructure and (iv) services for pre-start-ups, start-ups, companies, industry, (v) set up RTI coordination. Attention is placed on Burgenland’s core thematic fields: (i) sustainable energy (themes such as renewable energy, new construction materials, energy efficiency in buildings), (ii) sustainable quality of life relating to segments of life sciences (health and wellness, medical technology, food and beverages, hospitality services) and (iii) intelligent processes, technologies and products. RTI fields with a special potential for collaboration are (optical-) electronics, mechatronics, materials (plastics, wood, metal) and their intelligent application. Further inclusive fields of action with special significance for Burgenland are future production technologies (Industry 4.0), innovative (IT-supported) services and the creative industries. Implementation follows the principle of rolling strategy development. The strategic development and detailed operational planning of measures is carried out every year.

SUMMARY OVERVIEW – POLICY FRAMEWORK

Austria's innovation system and innovation policy have undergone a clear transformation. Today, Austria is a business location with a **mature RTI system** with globally networked institutions and a good system of cooperation between science and business, and a high degree of internationalisation and competitiveness on international markets (niche awareness).

Austria is characterized by a highly developed culture of always working to balance conflicting interests and of **involving stakeholders in planning processes**; by many years of broad consensus between politics, the business sector and society as well as between national and regional actors regarding investments in science, research, technology and innovation. Business enterprises and their interest group representatives are traditionally strongly involved in RTI policies in the spirit of “entrepreneurial discovery”.

Austria has a **balanced mix of instruments** for funding RTI projects which are used in the attempt to identify the fundamental moments of market and system failure. Generally in Austria, financial assistance schemes are strongly oriented on generic, technologically-open funding instruments. This also takes into account the diversified industrial and economic structure with companies focused on market niches. And finally, these investments in research/education, sustainability, social inclusion and in diversified economic and location structures enable a high resilience to crises.

With respect to policy definition, **Austria** has now shifted towards “**smart specialisation mode**”.

In 2011, the RTI strategy “Becoming an Innovation Leader” was adopted. The strategy created the consensus for a new vision of development (from “catching-up” to “frontrunning”). Although the concept of Smart Specialisation was not yet public at the time, the federal government produced the RTI strategy which already anticipated key elements of the Smart Specialisation strategy such as the broadly-based creation and implementation process and the monitoring of implementation.

Austria ...

→ follows a **systemic approach** in the RTI strategy for the measures and the attainment of objectives;

- operationalises the fundamental RTI policy priorities defined and addresses the grand challenges. The concrete **design** of the instruments and programmes is done by the competent ministries and agencies; in this context, the **thematic priorities** are addressed;
- focuses strongly on strengthening **private RTI investment activity** (frontrunner companies, broadening the innovation base, knowledge-intensive start-ups);
- defines a **management process** by setting up a task force at the highest level of public officials including theme-specific working groups as well as by assigning the task of monitoring to the Council for Research and Technology Development;
- has a highly developed **monitoring and evaluation culture** of public financial assistance schemes and investments.

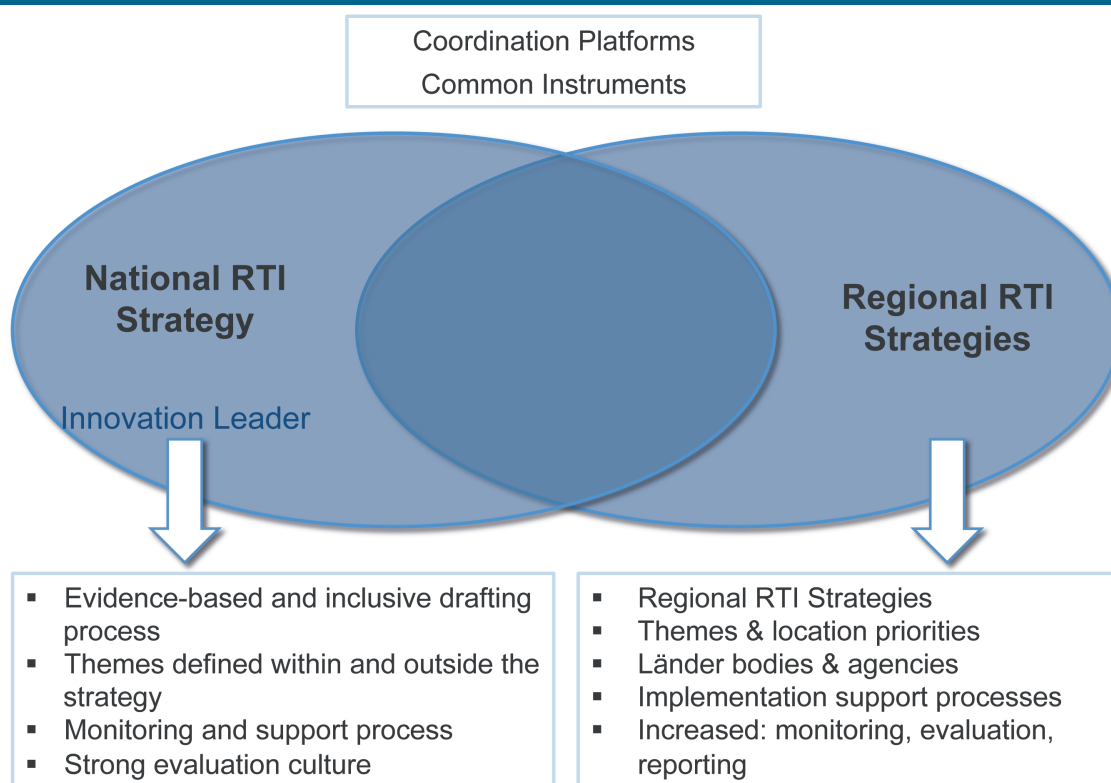
In the spirit of the **policy framework**, Austria relies on the principle of **multi-level governance** and has long-years of experience with a closely-knit system of autonomous but nonetheless coordinated multi-year strategic planning at all levels (national/regional/institutional).

The concrete development of the **location profile** for Austria is done at *Länder* level where the strengths and promising areas for a knowledge-based economy and its integration into the international value chain based on endogenous location factors are defined. This means that the diversified economic and location structure and the strong orientation of companies on niches are taken into account.

Today, all *Länder* have the relevant RTI strategies, budgets for financial assistance schemes and agencies that support the implementation of the strategies. Regular monitoring and reporting mechanisms are in place. Moreover, the federal government and *Länder* meet regularly to engage in dialogue.

The strategy and the **interaction** of the **federal government** and *Länder* do not follow a major master plan. Master plans tend to be of importance during “catching-up phases” and less in mature and institutionally-differentiated RTI systems. As regards the interaction of the federal government and *Länder*, this is a complementary system characterized by mutual learning. The

Figure 3: RTI policy framework Austria



Source: own research

design of regional strategies varies as regards time and processes in accordance with the autonomous status of the *Länder*. Asynchronous processing creates the advantage of enabling exchange and mutual learning. However, this also makes a systematic and regular overview of the status and implementation of the schemes and the development of common investigation and reporting standards difficult. A stronger focus on clearly measurable objectives with the corresponding indicators could serve as a foundation for a future generation of Smart Specialisation to achieve a structured overview and systematic monitoring.

Within the scope of the STRAT.AT 2020 Partnership “Smart Specialisation”, it became clear that Austria has accepted the Smart Specialisation concept, but that the exploitation of its potentials requires further and deeper coordination processes between the federal government and the *Länder*. This should also be viewed before the backdrop that knowledge-based location policy is being given more attention throughout Europe and that the search for new growth areas and paths out of the crisis requires closer strategic coordination between policy fields and governance levels.⁵⁰

50 See also Austrian Report on Research and Technology (Österreichischer Forschungs- und Technologiebericht) page 81.

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ANNEX

BURGENLAND

Strategy

RTI Strategy Burgenland 2025 (2014) (FTI-Strategie Burgenland 2025)

http://www.fti-burgenland.at/fileadmin/user_upload/FTI_Strategie_2025.pdf

Complementary: Development Strategy Burgenland 2020 (2012)

Available as an online brochure: <http://www.phasing-out.at/de/uebergangsregion/burgenland2020>

Strategy fields RTI strategy:

- Raise awareness for RTI
- Development of human resources
- Expansion of research infrastructure
- Services for pre-start-ups, start-ups, companies, industry
- Establish RTI coordination

Strategy fields of the development strategy:

- Use of resources and environment
- Regional development, economy and locations
- Education, qualification and employment
- Research and knowledge-based further development
- Quality of life and living environment

The RTI strategy is implemented by Wirtschaft Burgenland GmbH and by Regionalmanagement Burgenland GmbH and the newly-established RTI Coordination Body (FTI Burgenland GmbH).

Thematic priorities

- Sustainable energy (e.g. renewable energy, smart grids, new construction materials, energy efficiency in buildings and transport)
- Sustainable quality of life with areas from life sciences (health and wellness, pharma, medical technology, food and beverages, hospitality services)
- Intelligent processes, technologies and products. RTI fields with a special potential for collaboration are (i) (optical-) electronics, mechatronics, (ii) materials (plastics, wood, metal) and their intelligent application

Further inclusive fields of action with special significance for Burgenland are:

- Production of the future (Industry 4.0: automation and IT networked production and logistics, digital production and 3D printing, product and process security, steering and control technology)
- Innovative (IT-supported) services, and
- Creative industries

CARINTHIA

Strategy

RTI Strategy Carinthia 2020 - Future through Innovation (2009) (FTI-Strategie Kärnten 2020 Zukunft durch Innovation)

http://www.kwf.at/downloads/deutsch/Service/Buchtipps/Kaernten_2020_Zukunft_durch_Innovation.pdf

Resolution of the Land government 2009; the strategy document was signed by all members of the government.
Complementary: Economic Strategy for Carinthia 2013 – 2020 (Wirtschaftsstrategie für Kärnten 2013 – 2020)

http://www.klhd.at/fileadmin/user_upload/KLH-Gruppe/Wirtschaftsstrategie_fuer_Kaernten_2013%C2%AD2020.pdf

Strategy fields in the knowledge triangle

- Education: Strengthen Carinthia's institutions of higher learning
- Research: Cooperation of science and business
- Innovation: Broaden the innovation basis in Carinthia

Priority axes

- Human resources: More and better-qualified people in research and innovation, i.e. prepare the young generation better for technology fields
- Information and communication technologies: ICT location Carinthia with international profile
- Production technologies: Higher competitiveness in all industries
- Sustainability: Prosperity and quality of life for future generations

Innovation areas: Develop locations with international appeal

Operationalisation of the strategy for the set of measures was accomplished in a separate strategy group of the Land Carinthia.

Themes and thematic priorities

- Information and communication technologies (niche: self-controlled, networked systems)
- Sustainability technologies and materials (renewable resources, with ICT synergy priorities to be developed: smart energy, control technology, energy efficiency)
- Production technologies at the interfaces between IT, control technology, module switching technology (Industry 4.0)

LOWER AUSTRIA

Strategy

Economic Strategy Lower Austria 2020 “Growing the Right Way. Better Living.” (2015) (Wirtschaftsstrategie Niederösterreich 2020 „Richtig wachsen. Besser leben.“)

<http://www.noel.gv.at/Wirtschaft-Arbeit/Wirtschaft-Tourismus-Technologie/Strategie.html>

Close interaction of the Economic Strategy for Lower Austria 2020 and the RTI Strategy for Lower Austria, whose focus is on the further development of science in Lower Austria.

Science RTI Strategy, Research, Technology and Innovation Strategy for the Land Lower Austria – Fundamental Strategy (Wissenschaft(f) + FTI Strategie, Forschungs-, Technologie- und Innovationsstrategie für das Land Niederösterreich Grundstrategie)

<http://www.noel.gv.at/Bildung/Wissenschaft-Forschung/FTI-Strategie.html>

Tourism: The Tourism Strategy for Lower Austria 2020 was developed in close coordination with the economic strategy.

<http://www.noel.gv.at/Wirtschaft-Arbeit/Wirtschaft-Tourismus-Technologie/Strategie.html>

Strategy fields

Core strategy 1: Sustainable business success and internationalisation

Core strategy 2: Research, development and market implementation

Core strategy 3: Start-ups with growth dynamic

Core strategy 4: Attractive locations

The strand of innovation and technology is implemented in the Lower Austrian innovation pyramid; at the core are the service programmes: TIP (Technology and Innovation Partner), Cluster, Technopoles

Themes and thematic priorities

The strategy defines the framework (principles for taking action, core strategies and fields of action). The thematic priorities are defined in the implementation.

Technopole: location-related

- Krems: Medical biotechnology: blood purification systems, tissue engineering, cell therapies, cell biology/physiology
- Tulln: Agricultural and environmental technology: bio-analysis, environmental technology, plant cultivation, use of renewable commodities, pharmacy
- Wiener Neustadt: Medical and materials technologies: materials, tribology (friction, wear, lubrication), medical technology, sensors and actuators, surfaces
- Wieselburg: Bio-energy, agricultural and food technology: bio-energy, bio-mass, energy systems, agricultural and food technologies, water management, ecological building (focus on energy-efficient building and renovation)

Cluster: theme-related

- Construction. Energy. Environment: Renovation of historic buildings to low-energy standard, multi-floor new buildings in passive energy quality, living comfort and healthy interior climate, energy efficiency
- Food: Food quality and food safety, organic and regional products, resource efficiency
- Plastics: Bio-plastics, bio-packaging
- Mechatronics: Energy efficiency in production

UPPER AUSTRIA

Strategy

Strategic economic and research programme “Innovative Upper Austria 2020” (2013) (Strategisches Wirtschafts- und Forschungsprogramm „Innovatives OÖ 2020“)

http://www.ooe2020.at/files/download_programmbuch_web_low.pdf (German)

http://www.ooe2020.at/files/download_programmbuch_web_english.pdf (English)

Tourism: Tourism Strategy – Schedule for Tourism Upper Austria 2011-2016. (Tourismusstrategie Kursbuch Tourismus OÖ 2011-2016) (<http://www.oberoesterreich-tourismus.at/detail/article/kursbuch-tourismus-oberoesterreich-2011-bis-2016.html>)

Strategy fields

The strategic orientation of the programme is on the four core strategies

- Location development
- Industrial market leadership
- Internationalisation
- Future technologies

and on the innovation chain building-research-economy.

Programme management and control is done according to a defined ongoing monitoring process. This programme involves Action Field Management, the Action Field Committee (representative of the Council for Research and Technology), the bodies responsible for financial assistance as well as the competent economic department for overall coordination.

Themes and Thematic Priorities

Based on developments in European economic and research policy and major social challenges, five action fields were derived for Upper Austria:

- Industrial production processes
- Energy
- Health and aging society
- Food and nutrition
- Mobility and logistics

Strategic key objectives and goals for education-research-economy were defined for each field of action.

SALZBURG

Strategy

Science and Innovation Strategy Salzburg 2025/WISS 2025 (2016) Wissenschafts- und Innovationsstrategie Salzburg 2025/WISS 2025

Long version: http://www.salzburg.gv.at/wirtschaft_/Documents/wiss-langfassung.pdf

Short version: http://www.salzburg.gv.at/wirtschaft_/Documents/wiss2025.pdf

WISS 2025 is supplemented by the economic strategy “Economic Programme Salzburg 2020. Salzburg. Location Zukunft” (2011), which forms the strategic framework for economic and innovation policy.

http://www.salzburg.gv.at/wirtschaft_/Documents/ssz-wipro2020.pdf

Tourism: Strategy Plan for Tourism 2020

https://www.salzburg.gv.at/tourismus_/Documents/strategieplan_2020_-_internetversion.pdf

To supplement the Strategy Plan for Tourism, it is prominently anchored in the economy strategy (service innovation) due to its strong position.

Strategy fields

In the Science and Innovation Strategy Salzburg 2025, three action fields are defined to which objectives are assigned:

1. Strengthen the structures for science and research

- Create the critical mass at the Salzburg location and establish a profile based on priorities
- Targeted development of human resources for science, research and economy
- Expansion and better use of research infrastructure (core facilities)

2. Use of findings from science and research for the economy and society

- Strengthen knowledge and technology transfer activities and capacities
- Encourage knowledge-intensive start-ups and a start-up eco-system in Salzburg

3. Expansion and activation of research and innovation activities by companies

- Capture further research and innovation potentials of Salzburg's companies and strengthen internal innovation competence at companies
- Strengthen the creation of regional and supra-regional innovation networks in Salzburg's areas of strength

Implementation and process control lies with those projects groups whose responsibility is to prepare WISS 2025. At the operational level, ITG Salzburg plays an important role as an intermediary between science and research and the economy as well as politics and administration.

Themes and Thematic Priorities

- Life sciences
- ICT location Salzburg
- Smart materials
- Intelligent building and settlement systems
- Creative industries and service innovations

The thematic fields are not to be understood as “hermeneutic”, but rather as connected to each other and engaged in an exchange.

STYRIA

Strategy

Economic and Tourism Strategy Styria 2025 – Growth through Innovation (2016) **Wirtschafts- und Tourismusstrategie Steiermark 2025 – Wachstum durch Innovation**

http://www.wirtschaft.steiermark.at/cms/dokumente/10430090_12858597/b89a9de2/Wirtschafts-%20und%20Tourismusstrategie_03062016.pdf

Research Strategy Styria 2020 (2012)

http://www.gesundheit.steiermark.at/cms/dokumente/11806970_96572397/d8246e6e/Forschungsstrategie_A8_07.01.13.pdf

In the following, a concrete reference is made to the economic strategy “Growth through Innovation”.

Strategy fields

Core objective: Growth through innovation; European benchmark for a transformation into a knowledge-based production society

Five core strategies

- Location development and management
- Innovation and research & development
- Entrepreneurship and growth of young companies
- Qualification and human capital
- Internationalisation of location and company

The concrete definition of the instruments and programmes is done in operationalisation by Steirische Wirtschaftsförderungsgesellschaft (SFG) as the competent agency for financial assistance schemes for the economy and innovation. Steirische Wirtschaftsförderungsgesellschaft has defined its interventions fully on the five pillars of the strategy and operationalises these through intervention instruments and financial assistance programmes.

Themes and thematic priorities

The key themes and markets are (i) mobility, (ii) green-tech, (iii) health-tech. These are supported by the technological core competencies: materials technologies, production technologies, machinery and plant engineering, digital technologies and microelectronics. The creative industries are positioned as “innovation support”. Detailed strategies were defined for the key themes in an “entrepreneurial discovery process” within the collaboration process of the actors in the clusters along the knowledge triangle.

TYROL

Strategy

Tyrolean Research and Innovation Strategy (2013) **Tiroler Forschungs- und Innovationsstrategie**

The concrete definition of the R&I strategy is done in a working programme.

<https://www.tirol.gv.at/arbeit-wirtschaft/wirtschaft-und-arbeit/tiroler-forschungs-und-innovationsstrategie/>

Tourism: Strategy “The Tyrolean Way 2021” (2015) (Strategie “Der Tiroler Weg 2021“)

http://www.ttr.tirol.at/sites/default/files/upload/311_15%20Strategie%20Tiroler%20Weg%202021.pdf

Strategy fields

Strategic guiding principles: These are interpreted based on the assumption that the innovation and research location Tyrol will be developed to a sustainable, forward-looking and competitive standard.

- Strengthen the dynamic pace of development in Tyrol
- Exploit the synergy potentials of innovation players
- Promote the Tyrolean priorities and strengths
- Modernise and make governance structures more flexible
- Position Tyrol as an attractive location for work

The strategic guiding principles are implemented based on the concrete action fields, and subsequently, on the specific objectives. The objectives are quantified in the working programme of the Tyrolean research and innovations strategy.

Themes and thematic priorities

Thematic priorities are defined to further develop Tyrol's areas of strength:

- Life sciences
- Mechatronics
- Renewable energy sources
- Information technology
- Timber
- Wellness
- Tourism

Enlarged by the new areas of creative industries, materials sciences/materials technology and Alpine region

VORARLBERG

Strategy

Science and Research Strategy Vorarlberg 2020+ (2015) Wissenschafts- und Forschungsstrategie Vorarlberg 2020+

http://www.vorarlberg.at/pdf/wi_fo-strategie2020_web.pdf

Complementary: Economic Guiding Principles for Vorarlberg 2010+ (2007), update 2014 (2014) (especially action field 2: innovation)

<http://www.vorarlberg.at/pdf/vorarlbergerwirtschaftsle.pdf>

Tourism: Tourism Guiding Principles 2010+ (2007) have been defined, and moreover, a Tourism Strategy 2020 (2012) http://www.vorarlberg.at/vorarlberg/tourismus_kultur/tourismus/tourismuspolitik/start.htm

Strategy fields

The Science and Research Strategy Vorarlberg 2020+ defines six objectives, which in turn break down into the relevant action fields and measures:

- Objective 1: Strengthen awareness of the significance of science, research and innovation for the future of Vorarlberg
- Objective 2: Strategic further development of Vorarlberg as a location for science and research
- Objective 3: Higher spending for research and development in Vorarlberg
- Objective 4: Best-possible deployment of human potential and qualifications for society and economy
- Objective 5: Further stimulation of the research and innovation potentials of Vorarlberg companies
- Objective 6: Further internationalisation of science, research and innovation activities

The implementation of the RTI strategy is done by the competent Office of the Government of Vorarlberg and in close cooperation with Wirtschaftsstandort Vorarlberg GmbH (WISTO GmbH).

Themes and Thematic Priorities

- Smart textiles
- Energy and energy efficiency
- People and technology
- Education and health
- Intelligent production

VIENNA

Strategy

RTI Strategy: “Innovatives Vienna 2020” <https://innovation2020.wien.gv.at/site/> (2015)

FTI-Strategie: „Innovatives Wien 2020“ <https://innovation2020.wien.gv.at/site/>

The “Smart City Vienna” Framework Strategy (adopted by Vienna Land parliament) presents a strategic frame of reference for the city until 2050 and is the overarching strategy for “Innovative Vienna 2020”.

<https://smartcity.wien.at/site/>

Tourism: Tourism strategy 2020 <http://www.tourismusstrategie2020.wien.info/>

Strategy fields

Innovation Objective No. 1: Vienna as the city of opportunities

- Vienna as an attractive city for researchers and companies
- Further development of areas of strength
- Sustainable funding and effective financial assistance
- Education that prepares for innovation

Innovation Objective No. 2: Innovative city administration

- Lastingly anchor innovation culture in city administration
- Public procurement that promotes innovation

Innovation Objective No. 3: Vienna as a city of encounters

- Space to create an innovative environment
- Increase visibility and raise interest

The implementation of the RTI strategy is defined in an annual working programme.

Themes and thematic priorities

Strategy fields:

- Life sciences
- ICT
- Creative industries
- Humanities, cultural and social sciences
- Certain areas of mathematics/physics

Complementary: Innovative solutions to promote the sustainable and socially-inclusive development of the city (smart solutions) as well as innovative production and manufacturing processes (smart production)

Overview Federal Government and Länder

	Federal government	Burgenland	Carinthia	Lower Austria	Upper Austria	Salzburg	Styria	Tyrol	Vorarlberg	Vienna
Strategy corresponding to Smart Specialisation	Becoming an Innovation Leader	RTI Strategy Burgenland	RTI Strategy Carinthia 2020 - Future through Innovation	Economic Strategy Lower Austria 2020	Strategic Economic and Research Programme „Innovative Upper Austria 2020“	Science and Innovation Strategy Salzburg 2025	Economic and Tourism Strategy 2025 – Growth through Innovation	Tyrolean Research and Innovation Strategy	Science and Research Strategy Vorarlberg 2020	Strategy for Research, Technology and Innovation – Innovative Vienna 2020
Resolution adopted (main document)	2011	2014	2009	2014	2013	2016	2016	2013	2015	2015
Duration	2020	2025	2020	2020	2020	2025	2025	2020	2020+	2020
Complementary strategy/ general strategy	Sectoral strategies	Development Strategy Burgenland 2020 (2012)	Economic Strategy for Carinthia 2013–2020 (2013)	RTI Strategy for Lower Austria Basic Strategy and RTI Programme (2012)	RTI Strategy for Lower Austria 2011 bis 2016	Economic Programme Salzburg 2020. Business Location Future (2011)	Research Strategy Styria 2020 (2012)	Guiding Principle for the Economy of Vorarlberg 2010+ (2007), updated 2014 (2014)	Guiding Principle for the Economy of Vorarlberg 2010+ (2007), updated 2014 (2014)	Smart City Vienna Framework Strategy
Tourism Strategy	New Paths in Tourism (2010)	Tourism Strategy Burgenland 2015	Outlook Tourism Strategy of Carinthia	Tourism Strategy Lower Austria 2020	Guide for Tourism Upper Austria 2011 bis 2016	Tourism Strategy Plan Tourism 2020	"The Tyrolean Way 2021"	Tourism Strategy 2020	Tourism Strategy 2020	Tourism Strategy 2020
Formulation of objectives including quantified goals	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Competent administrative authority	partly	partly	partly	partly	partly	partly	partly	partly	partly	partly
Agencies	FFG, FWF, Climate and Energy Fund	Wirtschaft Burgenland GmbH (WiBuG), Regional Management Burgenland, RTI Burgenland	Kärntner Wirtschafts-förderungs-fonds (KWF)	ecopuls Nieder-österreichs Wirtschaftsagentur GmbH, NOBEG, tecnet, NFB	Business Upper Austria – Wirtschaftsagentur Oberösterreich (biz-up)	Innovations- u. Technologie-transfer-Gesellschaft mbH (ITG) Salzburg	Steirische Wirtschaftsförderungsgesellschaft mbH (SFG)	Location agency for Tyrol, planned: Land coordination body for research and Innovation	Wirtschaftsstandort Vorarlberg (WISTO) GmbH	Business Agency Vienna and Vienna Science Research and Technology Fund
Monitoring process, Operationalisation, Implementation	RTI Task Force , sectoral strategies	Rolling planning – annual detail planning of future measures	RTI Strategy group, operationalised in set of measures	Within the scope of the BSC process and RTI programme	Control and steering cycle at programme and Land level	Project group for implementation and process control	Thematic strategies for clusters, reflection in Location Dialogue Styria	Implementation is done in concrete working programme	Steering group	Annual working programme, internal municipal body
Monitoring process advisory body	Austrian Council for Science, RTI Council	Planned: Burgenland Council for Research and Technology Development	Economic Policy and Advisory Council for Science	Steering group, cooperation with the Council for Research and Technology Development of the federal government	Council for Science and Technology for Development for Upper Austria	Council for Science and Research	Research Council for Styria	Planned: Research Council	Advisory Council for Science	Extended Advisory Council
Monitoring process data monitoring	Council for Research and Technology Development: Annual Monitoring Report, Research and Technology Report of the federal government	Done within the rolling planning	Quarterly monitoring of measures implementation	Balanced Scorecard Method (BSC) also serves as evaluation	Ongoing programme monitoring (project figures, statistical indicators)	Council for Research and Technology Development has a monitoring function	Monitoring of economic development and data on financial assistance of the Land	Monitoring based on indicator sets of the working programme	Annual monitoring of R&D spending and financial aid schemes	Monitoring within the working programme, annual implementation report STAT R&D special evaluation
Evaluation	Interim review and programme evaluations	Annual monitoring is planned, rolling planning	Regular evaluation of the Carinthia Technology Fund	Within the scope of the BSC process	Interim evaluation 2016	Evaluation planned for the period from 2018 to 2022	Evaluation of core strategies & programmes	Evaluation at mid-term to prepare the follow-up strategy	Evaluation planned for 2018 and 2021	Evaluation 2018/19

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