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Republic of Austria

RTI Pact 2021–2023

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Preamble

The Austrian federal government ratifies a Pact on Research, Technology and Innovation (RTI Pact) for the period 2021–2023, as specified in the Research Financing Act. The RTI Pact operationalises the targets and fields of activity of the RTI Strategy 2030, and defines strategic, research and innovation focuses. These priorities are then implemented by the Ministries through the performance and funding agreements with the key institutions, in line with the statutory mandate of each one, and through further measures as necessary.

1 Strategic priorities and measures to achieve the objectives for 2021–2023

The RTI Pact establishes the definition of cross-departmental research and innovation policy priorities as a fundamental principle of Austrian RTI policy. This is intended to improve the coordination of implementation activities and achievement of objectives while avoiding duplication of effort. The RTI Pact connects the RTI Strategy, funding and the institutions responsible for practical implementation. This adds a new, integrative element to the Austrian RTI landscape, creating a stable and dependable framework for the next few years for the individuals and groups concerned. In the area of research funding in particular, this means some changes:

- Reform of governance structures for research funding as stipulated by the Research Financing Act, to provide improved and more agile processes and clear structures for interactions between federal ministries and research funding institutions;
- Revision of the programme and instrument portfolios of the funding institutions, with the aim of providing straightforward and transparent access for funding applicants, and more extensive programmes, while also maintaining programmes for experimental formats;
- In the area of basic research, the focus is on funding for individual projects in an open-topic area, while in applied research mission-oriented priorities will also play a role.

1.1 Fields of activity for Objective 1: Become an international innovation leader and strengthen Austria as an RTI location

For Objective 1 (“Become an innovation leader and strengthen Austria as an RTI location”) the key fields of activity are:

1.1.1 Expand research and technology infrastructure (RTIS) and facilitate access

Appropriate research and technology infrastructures are a key factor for strengthening the long-term position of Austria as a location for research and innovation. In view of the high cost of RTIS it is particularly important to ensure that procurement is coordi-

nated, and oriented to the relevant needs and users. The aim is to attract national and European funding (including Structural Fund resources) as well as private financing in the form of operator models.

Research and technology infrastructures include appropriate test environments, experimental labs and pilot production facilities. These are essential to speed the development, testing and successful market launch of innovations. The increasing complexity of research questions demands solutions based on data infrastructure, high performance computing, secure transmission using a quantum communication infrastructure and comprehensive data management for calculation, analysis, storage, transfer and accessibility of data.

Measures:

- Cooperative use and coordinated expansion of research, technology and data infrastructures (including international participations), such as the Vienna BioCenter Vision, high performance computing and EuroHPC including EOSC, test environments, mobility laboratories and pilot production facilities. Expansion of high performance computing infrastructures (including GPU clusters) for use at the interface between science and industry (e.g. for AI);
- A corresponding action plan for 2021–2027 is being prepared, setting out the regulations for access and use, and providing a transparent overview of existing infrastructures (research infrastructure database);
- Participations are planned in the following European and international research infrastructure projects, depending on progress in each area: membership of ACTRIS, EHRI, E-RIHS, GGP, CTAELIXIR, eLTER, EMPHASIS;
- Creation of a new national Centre for Climate Research and Public Services, by merging the Geological Survey of Austria and the Central Institute for Meteorology and Geodynamics (ZAMG); also a "Micro Data Centre" for Statistics Austria, to improve access for researchers to microdata and register data;
- Funding of calls for proposal, making use of EU programmes, transnational funding frameworks, ERDF funding and national funding sources.

1.1.2 Increase participation in EU missions, EU partnerships and "Important Projects of Common European Interest (IPCEIs)"

The strategic use and co-design of European and international programmes is a key factor in a competitive RTI system. Austria will benefit not only from the funds acquired but also from working in collaboration with European and international partners. Austrian participation so far has been outstandingly effective, with the second-highest success rate in the EU (approved projects in relation to projects submitted) and a consistently positive balance with regard to financial contributions made and received.

Under Horizon Europe, the new EU Framework Programme for Research and Innovation for the period 2021–2027, missions and partnerships will be of particular strategic importance. Austria will make targeted use of its strengths and set new priorities. The three RTI ministries and the central institutions will intensify strategic coordination and matching when setting priorities for international priority action and will continue to develop international collaboration and mobility programmes. The introduction of missions at European level will make it necessary to align national research activities and research funding programmes with these.

Another significant new development under Horizon Europe is the European Innovation Council (EIC). With the EIC, Europe aims to significantly improve the advancement of European scale-ups and to promote ground-breaking global breakthrough successes by young companies.

Another new feature is the Digital Europe Programme (DEP). This is a sector-specific programme designed to build up the capacity (R&D, knowledge transfer) in key areas of digitalisation.

To ensure that Austria can in future continue to maximise involvement in shaping European research and innovation programmes and make the best use of them, and to profit from a common European Research Area, the following steps will be taken:

Measures:

- Targeted financial support for institutions and applicants involved in European innovation programmes under Horizon Europe, particularly Pillar II, and Digital Europe;
- Active participation in shaping the European Research Area and developing an "Austrian Action Plan for the European Research Area";
- Active and coordinated participation in the ESFRI (European Strategy Forum on Research Infrastructures) Roadmap, to strengthen international research and make use of the associated infrastructures;
- Increased focus on "smart specialisation", which will also strengthen the coordination of research policy activities between the federal government and the states;
- Participation in selected IPCEIs (Important Projects of Common European Interest) which are of particular interest to Austrian research and production locations (such as microelectronics and batteries). Furthermore, IPCEIs such as Microelectronics II, Hydrogen, Low CO2 emissions, Life Sciences are being discussed;
- Austria will promote the KICs (Knowledge and Innovation Communities) focused on raw materials, production and the creative industries, continue to support the flagship programmes and participate in the following 13 possible RTI partnerships in Horizon Europe: European Open Science Cloud (EOSC) Partnership, European

Partnership for Chemicals Risk Assessment, European Partnership—ERA for Health, European Partnership on Health and Care Systems Transformation, European Partnership—Driving Urban Transitions to a Sustainable Future, European Partnership for Clean Energy Transition, European Partnership Rescuing Biodiversity to Safeguard Life on Earth, European Partnership Water Security for the Planet—Water4All, European Partnership for Innovative SMEs, European Partnership on Metrology, EU-Africa Global Health Partnership, European Partnership for Key Digital Technologies, European Partnership for High Performance Computing;
- Under the Austrian chairmanship of EUREKA, which runs until June 2021, the priority is to further develop the range of instruments and to expand international collaborations.

1.1.3 Promotion and strategic targeting of internationalisation

Teaching and research targeted at internationality are key factors of academic excellence and essential for successful positioning of higher education institutions, research institutions and research companies in our global knowledge-based society. Higher education institutions in particular are already educating future leaders with a global perspective, European consciousness and an awareness of sustainable development. By this, they are making a significant contribution to the societal and economic position of a small but competitive country.

Internationalisation of the RTI system can be improved and made more efficient by taking the following steps:

Measures:

- Increase international visibility and networking, coordinating strategic international collaborative measures will be further improved, as will Austrian representation abroad in the RTI sector;
- Formation of national, transnational and international collaborations, alliances and implementation of partnerships focused on specific issues (e.g. a climate protection cluster);
- Selection of international priority countries and expansion of targeted bilateral and multilateral research cooperations;
- Increased visibility for Austria as a location for research and innovation, and appropriate positioning of the country's image;
- Expansion and establishment of internationally active technology companies and start-ups, supported by appropriate instruments.

1.2 Fields of activity for Objective 2: Focus on effectiveness and excellence

The key fields of activity for Objective 2 ("Focus on effectiveness and excellence") are:

1.2.1 Promote excellence in basic research

Austria has a well-developed system of research institutions and research funding institutions. Cutting-edge research takes place in universities, universities of applied sciences, non-university research institutions and research-oriented companies. However, it is fragmented in some areas and the staff sometimes isolated. To achieve international relevance and visibility in selected areas of strength, it is vital to have a critical mass of researchers and infrastructures.

The strategy in this context is clear: cooperation in selected areas of strength allows small institutions to overcome disadvantage of scale. Cooperation will therefore be encouraged on a targeted basis and not left to chance. Competition is the best decision-making mechanism and in the long term is more effective than any monocratic awarding body, as it results in reasonably fair allocations of public funds, increased quality and ultimately the promotion of excellence.

Measures:

- Realisation of the excellence initiative through the Austrian Science Fund, to provide internationally visible support for cutting-edge research, as well as establishing and consolidating cross-institution structures;
- Performance agreements with universities and the central institutions for basic research (Institute of Science and Technology Austria, Ludwig Boltzmann Gesellschaft, Austrian Academy of Sciences) specified in the Research Financing Act will establish the focus on excellence and appropriate competitive mechanisms for internal allocation of funds;
- Cooperative use and coordinated expansion of high-performance profile-building research and technology infrastructures, such as those of the Vienna BioCenter Vision, HPC and EuroHPC, including the EOSC, taking account of any participation in international infrastructures;
- Development and testing of new, innovative types of instruments and measures for funding excellent research which may also be high-risk, and targeted use of open innovation and citizen science methods, to identify research questions of relevance to society.

1.2.2 Support applied research and its impact on the economy and society

To succeed in a globally competitive environment requires RTI-oriented industrial policy, supporting Austrian businesses throughout strategic value creation chains, in the areas of digitalisation and decarbonisation, and giving them a position of strength in fields with the most promising future. Applied research plays a key role in this.

Mission-oriented programmes can make a significant contribution to overcoming society's central challenges (climate protection, digital transformation), by forging links between stakeholders, taking account of different interests, and incentivising the development of new solutions. However, this requires systemic change, which demands increased cooperation between all relevant stakeholders, the creation of an environment which encourages research and innovation, increased inter- and transdisciplinarity and nurturing of creative thinking in the RTI sector. Over the next three years the range of RTI instruments will be comprehensively extended and existing formats will be coordinated or in some cases merged. Openness to possible topics and towards different technologies are a core principle for this process.

Measures:

- Establishment of a technology offensive, with the aim of improving commercial exploitation of R&D output, increasing impact and strengthening crisis resilience;
- Promotion of entrepreneurial cutting-edge research and cooperation between science and research;
- Targeted support for SMEs to facilitate their access to research and innovation, or to intensify their research and innovation activities, improving innovation capacity and impact in the private sector (especially SMEs) by means of technology and knowledge transfer within networks. Strengthening successful cooperative instruments and flagship programmes;
- Further enhance the appeal of Austria as a location for research-intensive companies, in order to reduce foreign dependency, and to attract new investment and employment opportunities to Austria. In this context the entire life-sciences sector has emerged as an important player and should therefore be particularly emphasised. Targeted support should also be given to repatriation of research and production facilities, in order to achieve or safeguard technological sovereignty. The same also applies to other fields of technology such as artificial intelligence, quantum technologies and high-performance computing;
- Innovative (key) technologies and new business and operator models should also receive targeted support, as should the digital skills of employees in the private sector. Here the digital transformation should be seen as an opportunity for an open and competitive national economy. Innovation laboratories and experimental areas for the development and testing of new solutions, technologies, products and services, as well as business and operator models, have also proved effec-

tive, including for early assessment of the impact of new technologies. Similarly the prioritisation of "Impact Innovation" should be continued, focusing on new business models and on creative, social and societal innovations throughout the entire commercial cycle, from the initial phase right through to upscaling;

- In addition to specific environmental technologies (green tech), funding will be increased for Tech4Green and circular economy initiatives, to encourage the development of new business models and products which will directly or indirectly contribute to meeting our climate and environhmental goals, and optimise existing processes by improving efficiency and conserving resources. It is essential to coordinate mission-oriented, technology-focused RTI measures at national and European level, with the aim of developing systemic solutions for societal challenges (e.g. Tech4Green production, circular economy, smart cities, sustainable mobility solutions, participations in selected "Important Projects of Common European Interest");
- Targeted support for entrepreneurial innovations is a key responsibility of the research funding bodies listed in the Research Financing Act (FoFinaG). A broader definition of innovation is used in this context, encompassing not only technological innovations, but also societal, creative and sustainable innovations which reflect the Sustainable Development Goals (SDGs). This support should include the entire innovation chain (from the initial phase through to the start-up and scale-up phases), and should be needs-oriented (grants, incubator services, protection of intellectual property, provision of venture capital);
- Joining up the innovation chain, in order to enhance the societal and economic benefits of research, is a key aspect. Explicit priority-setting will be incorporated into performance agreements, to maximise conversion of the products of basic research and artistic-scientific research; an increased focus on spin-offs will also be encouraged, with support in the form of targeted funding instruments for researchers founding start-ups. A broader range of collaborative instruments will be developed at the interface between science, the arts and the economy, particularly to promote the transferability of researchers between the private sector and public research institutions. Companies with particularly strong scale-up potential should be identified and supported, and the funding programmes of the European Innovation Council EIC utilised to the full. A successful RTI system is based on a broad understanding of innovation, targeted funding and a broad acceptance of the need for a bold approach to new ideas. Entrepreneurship education must be embedded in the curriculum, at least in tertiary educational institutions, as well as increased visibility of entrepreneurs and funding opportunities. A master plan is in preparation which will make the wide—and sometimes confusing—range of funding opportunities and institutions more visible, specifically targeting academically-based innovators. The bridging points that link creative and scientific research with the economy and society need to be identifiable and should be the subject of targeted funding. Particular attention can and should be given to female entrepreneurs.

1.2.3 RTI for achievement of the climate targets

The climate crisis is one of the greatest societal challenges of our time. In order to achieve climate neutrality by 2040 and thus contribute to maintaining our health, prosperity and a high-quality living environment, more sustainable, environment-friendly technologies and solutions in the areas of climate protection, intelligent climate adaptation, the circular economy, renewable energy and transport are required. Science, research, education, innovation funding as well as targeted investment will provide important leverage in this process.

Meeting this research target will require a particular emphasis on support for system-oriented research, as well as an inter- and transdisciplinary approach within research programmes and institutions. The complexity of the issues means research has to be long-term, transdisciplinary, open with regard to the range of technologies, solutions- and implementation-oriented, experimental in character, and must involve integrated participation by the relevant stakeholders and civil society.

Alignment with European programmes will be an integral part of the work towards achieving the climate targets, for example Horizon Europe for RTI and the European Green Deal as a materially relevant policy framework.

Lastly, considering the special role of key technologies will not only help to maintain and enhance the competitiveness of the Austrian economy during the transformation of our economic system, but will also make an important contribution to meeting the climate targets. This will require further development of technologies to accelerate the transition to a circular economy and advance this concept from niche interest status to a broad acceptance.

Measures:

- Mission-oriented funding programmes can make a significant contribution by pursuing a coordinated, cross-sector approach, keeping regulatory frameworks in mind and responding to the needs of stakeholders. This approach also strives to involve all relevant individuals and groups, including reaching out to civil society. Mission-oriented priorities in areas of importance to climate and environmental protection are heat and energy generation, agriculture, transport, buildings and industrial manufacturing;
- Funding for RTI projects and key technologies of relevance to sustainable economic activity, working towards a circular economy for instance, or to climate-friendly regional and urban structures, or inclusion and equal opportunity. In addition to specific environmental technologies (green tech), government funding and support measures will also be designed to promote those technologies whose deployment can directly or indirectly contribute to environmental goals (e.g. Tech4Green, nanotechnology, AI and robotics, quantum technology);

- Greater consideration of sustainability, climate and environmental protection in funding programmes, and targeted management of cross-sector measures that contribute to mission-oriented strategies, such as sustainable urban development, and flagship and model regions;
- Increasing the impact of climate- and environmentally relevant technologies through public procurement of innovations (PPPI), technology transfer and exports (internationalisation of technology), as well as real-world laboratories, experimental environments and support for social and organisational innovations;
- Monitoring (including satellite-controlled remote sensing) and complementary research for impact analysis and in order to avoid unwanted effects.

1.3 Fields of activity for Objective 3: Focus on knowledge, talents and skills

The key fields of activity for Objective 3 ("Focus on knowledge, talents and skills") are:

1.3.1 Develop and promote human resources

A high-quality education system is of particular importance for a society whose prosperity depends on innovation capacity and high technological standards. We want to leverage existing potential and make better use of the opportunities available. This means exploiting our educational reserves and increase the proportion of women in employment.

Enthusiasm for scientific investigation and research needs to be stimulated at an early age, creating an understanding of the important role of these activities in tackling the great societal challenges. Above all, an interest in natural sciences, climate protection and the digital transformation must be nurtured. Entrepreneurship education has to be integrated into the relevant curricula.

A broad base of well-educated individuals is essential for excellent performance in the RTI sector. Application-oriented RTI collaborations through research projects at the intersection of science, the arts and the economy make a significant contribution by supporting the further development of highly qualified RTI personnel.

To improve gender equality in RTI, women's research careers need to be promoted and made more appealing. Here in addition to increasing the visibility of these career paths and professions we need to intensify equal opportunity programmes and measures in human resources and career planning. Corresponding initiatives are essential, as is consideration of gender and diversity aspects in research funding, in order to break down the barriers to equal opportunities and participation.

Measures:

- Enhancement of science and entrepreneurship education, e.g. by expanding children's and youth university programmes, and targeted support measures such as collaborations between research and education, and school competitions for the development of creative and innovative ideas throughout the education system;
- Advancement of women in science, to make careers in this area more appealing, and to raise the level of interest in STEM studies; establishment and expansion of targeted programmes for the advancement of women are essential, together with increased consideration of gender aspects in the evaluation of research proposals and recruitment to executive positions;
- Promote the next generation of scientific and artistic talent through structured and financially secure doctoral programmes; embedding these priorities in performance agreements with the universities is essential if these aims are to be realised;
- Further development and expansion of innovative models for foundations such as the Innovationsstiftung für Bildung (Innovation Foundation for Education), so that targeted funding programmes can be instigated outside the government finance options.

1.3.2 Support researchers and students in developing an international outlook

Networking and exchange with international partners have been a reality in Austrian higher education institutions for several decades already. Collaboration within the framework of the Bologna Process, for instance, or participation in the European Union's Erasmus programmes is seen as valuable enrichment. The key to making Austria increasingly visible on the global stage in future as a centre of higher education, is increased internationalisation. The same is true for the young people leaving the education system and entering the employment market. Foreign language skills, study visits abroad, and a global mindset are important criteria for a successful start to working life.

Measures:

- Development of an internationalisation strategy inside higher education institutions, with a clear commitment to internationalisation embodied in an explicit framework. Creating a strategy like this requires detailed engagement with the longer-term goals of the institution, consideration of the demands of and potential for internationalisation, and active participation in international mobility programmes (particularly Erasmus);
- Integration of international and intercultural aspects into curricula and the teaching and learning environment, reflecting a comprehensive definition of the internationalisation of study and teaching. The concept of "Internationalisation@ Home" includes any measures and activities designed to create an international environment within the higher education institution concerned;
- Collaboration with partner institutions in other countries in the form of shared study programmes, or "joint programmes". This means collaborative development

and implementation of a curriculum by a partnership of at least two international institutions of higher education. Joint programmes offer an outstanding opportunity to develop high-quality, long-term collaborations;

- International cooperation for the creation of "European Universities" through the Erasmus+ programme. European Universities are an alliance of several higher education institutions from countries which are full participants in the Erasmus+ programme, collaborating to an unprecedented extent in teaching and research, and working towards the creation of an inter-university campus;
- Expansion of institutionalised network structures with countries outside the EU (e.g. RINA—Research and Innovation Network Austria and ASCINA—Austrian Scientists and Scholars in North America). These network structures provide an important foothold for Austria in the research landscape of the USA. This improves the potential for "brain circulation", and enhances international perspectives in research and teaching;
- Improve the visibility of Austria as a research location and create attractive conditions that appeal international talents.

2 Central research institutions and research funding institutions

The Research Financing Act defines the ten central federal government institutions with whose collaboration this Pact will largely be implemented, through performance and financing agreements. The priorities of the three-year RTI Pacts are allocated to the institutions by negotiation and discussion between them and the relevant Ministries. Implementation follows with each institution working in areas relevant to its own statutory mandate.

Austrian Institute of Technology (AIT)
Austria Wirtschaftsservice (AWS)
Christian Doppler Research Association (CDG)
Institute of Science and Technology Austria (IST Austria)
Austrian Research Promotion Agency (FFG)
Austrian Science Fund (FWF)
Ludwig Boltzmann Gesellschaft (LBG)
Austrian Academy of Sciences (OeAW)
OeAD—Agency for Education and Internationalisation
Silicon Austria Labs GmbH (SAL)

3 Other instruments / institutions

In addition to the central research and research funding institutions, the Austrian Federal Ministry of Education, Science and Research (BMBWF), the Federal Ministry for Digital and Economic Affairs (BMDW) and the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) also rely on other institutions to support their activities in research, innovation and technology; to enable them to utilise additional technological and strategic expertise, involve the key stakeholders in each field of activity, ensure international compatibility and to respond to trends and circumstances, the ministries collaborate on specific issues with various experienced and skilled organisations including the following:

- Austrian Business Agency (ABA)—targeted campaigns to promote Austria as an RTI location, and for recruitment and retention of specialist professionals in Austria;
- Austrian Cooperative Research (ACR)—targeted support for companies (particularly SMEs) with their innovation and digitalisation projects;
- Austria Tech GesmbH;
- Complexity Science Hub;
- Documentation Centre of the Austrian Resistance (DÖW);
- Joanneum Research GesmbH;
- Austrian Society for Environment and Technology (ÖGUT);
- platforms such as Industry 4.0;
- Salzburg Research GesmbH;
- Vienna Wiesenthal Institute for Holocaust Studies (VWI).

More extensive use is to be made of international participations and international and European memberships for group collaborations.

It is of central importance for the positioning of Austria as an RTI location that we continue to make the best possible use of participation in international organisations, including the following:

- European Space Agency (ESA);
- European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT);
- European Organisation for Nuclear Research (CERN);
- European Molecular Biology Laboratory (EMBL);
- European Southern Observatory (ESO).

4 Budget

The Research Financing Act stipulates that the RTI Pact cover the global budget 31.03, the Budget Chapter (UG) 33 and the Budget Chapter (UG) 34. The budgetary priorities defined in it are specified in the performance and financing agreements established between the relevant minister and the agencies and central research institutions involved in implementation, which provide strategic direction and management. All institutions also work on the tasks allocated to them in accordance with their statutory mandate, which is also reflected in the budget of the RTI Pact. Austria's international memberships and participation in international and European research infrastructures and other measures for implementation of the RTI Strategy or other research policy initiatives or strategies are also financed by the same budget.

For implementation of the 2021–2023 RTI Pact, based on the Medium-term Budgeting Framework Act (BFRG) for 2021–2024, the federal government has allocated the amount of € 3,858.3 million; this is divided as follows:

GB 31.03 = € 1,927 million

UG 33 = € 346.5 million

UG 34 = € 1,584 million