FINNISH GOVERNMENT | Research and Innovation Council

National strategic choices for RDI policy and activities

Research and Innovation Council's preparatory working group, 25 February 2025

Contents

Please note, this English translation is indicative

Request for statement – introduction

Based on previous parliamentary work, the Multiannual plan for the use of government research and development (R&D) funding outlined that Finland's future success will be built with the strategic choices in R&D activities. Global and national societal challenges and the opportunities they create for R&D actors are identified in R&D activities and its targeting, taking into account Finland's strengths.

National strategic choices for RDI policy and activities are identified under the leadership of the Research and Innovation Council (RIC/TIN) in an inclusive and open process. As part of the preparation of the choices, a consultation round will be organised from 26 February to 10 March and an open stakeholder event will be held on 28 February 2025 (vn.fi/tin).

Based on extensive material and stakeholder discussions, the Council's preparatory body and secretariat have prepared preliminary proposals for choices, which have also been prepared using foresight material.

The aim is for the Research and Innovation Council to outline the choices before the mid-term policy review in March and to approve the report on them in June 2025. The final selection of choices will be modified and specified after this consultation round.

Request for statement – background (1/2)

Prime Minister Petteri Orpo's Government is committed to the national target of increasing Finland's research and development expenditure to 4% of Finland's GDP by 2030. During this parliamentary term, the Government will accelerate the achievement of the target by investing a total of approximately one billion euros in the R&D activities of higher education institutions, research organisations and companies. R&D investments aim at sustainable economic growth, and broad and long-term impact.

The Multiannual plan for the use of government R&D funding approved by the Government in June 2024 contributes to the allocations of additional R&D funding. National strategic choices for RDI policy and activities will be made alongside and on the basis of the multiannual plan.

Preparation of the choices started at an open seminar on 8 November 2024, which was followed by a stakeholder survey in late November/early December. Stakeholders emphasised, such things as, the importance of longer term approach, effectiveness, and experts and made proposals for the themes of choices.

The strengths identified by the Academy of Finland and Business Finland, the choices already made and foresight data have been utilised in the preparation of the choices. The detail size of the choices must be such that they support decision-making in different areas, and allow different approaches and new openings. The choices do not reach the sector or technology-specific level. The choices are interlinked to each other, and effective RDI activities are also created at their intersections.

Request for statement – background (2/2)

Choices are made in the RDI system continuously. In the future, national strategic choices for RDI policy and activities will support the long-term outlook needed by companies, investments, research and development activities and scientists.

Strategic choices are part of the development of the RDI system and R&D funding as a whole, in which a researcher and company-oriented approach will continue to be applied as a basic rule. The system will be developed in a comprehensive and balanced manner in accordance with parliamentary policies.

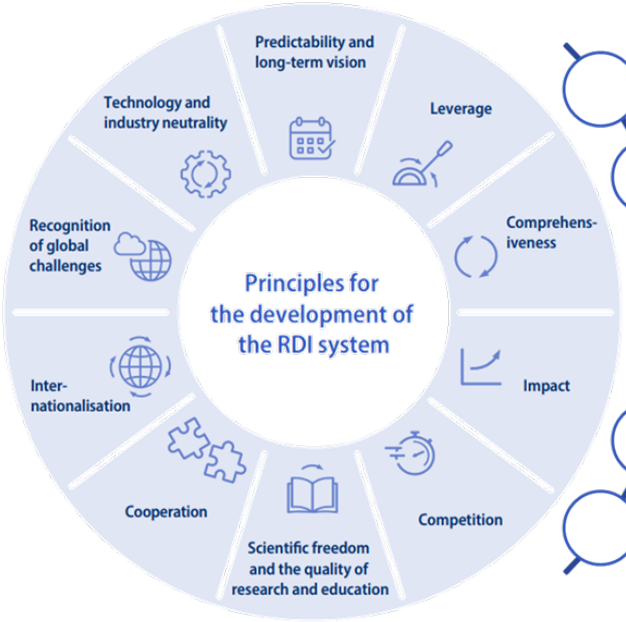
The current selection process is now being carried out for the first time ever under the leadership of the Research and Innovation Council and is being developed further on the basis of lessons learned. The Research and Innovation Council continuously monitors the operating environment and continues to identify choices when necessary.

Schedule

A statement on the strategic choices for RDI policy and measures is requested by Monday 10 March 2025. The request for a statement was published on 26 February 2025.

Multiannual plan for the use of central government R&D funding

- Finland aims to increase R&D expenditure to 4% of its GDP by 2030.
- The Multiannual plan for the use of central government R&D funding was approved in June 2024.



Main policies

- The strength of Finland's R&D activities lies in cooperation
- Increase in ambitious R&D activities by companies accelerates economic growth
- Increasing R&D competence and an increase in the number of R&D experts support productivity growth
- High-quality research and technology infrastructures increase Finland's attractiveness
- Increasing international cooperation strengthens the quality of research and the competitiveness of companies
- Strategic choices in R&D activities contribute to Finland's future success

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Multiannual plan for the use of central government research and development funding

Objectives of strategic choices

R&D investments aim at broad and long-term impact. The Multiannual plan for the use of central government R&D funding approved by the Government in June 2024 already outlines the allocations of additional R&D funding. National strategic choices for RDI policy and activities will be made and implemented alongside and on the basis of the multiannual plan.

Strategic choices are part of the development of the RDI system and R&D funding as a whole, in which a researcher and company-centred approach will continue as a rule. The system will be developed in a comprehensive and balanced manner in accordance with parliamentary policies.

Strategic choices:

- Compile and direct public and private resources.
- Create a framework for cooperation.
- Support the strategic decision-making, policy measures, and EU lobbying by the Government and various administrative branches.
- Support decision-making by RDI actors and stakeholders, the allocation of funding, and the development of the system.
- Provide companies and researchers with a more long-term and predictable view of Finland's commitment to selected priorities.
- Support the regional development of RDI activities.
- Communicate to European and international experts, companies, investors and partners about the strengths of Finnish expertise and RDI activities.

Impact paths of strategic choices

1. **Allocation of government R&D funding**
    - The allocation of government R&D funding as part of the general government fiscal plan and budgetary processes
    - The aim is internationally competitive research and competence centres and ecosystems
2. **National collaboration between RDI actors and ministerial sectors**
    - Strengthening national collaboration
    - Cooperation between R&D funding agencies, e.g. joint and parallel programs
    - Actions carried out in different ministerial sectors and in other policy areas supporting the choices
    - The effectiveness of the choices requires increased RDI expertise, a growing number of RDI professionals, and a higher level of education in both private and public sectors
3. **International cooperation and influencing**
    - EU and international influencing and country promotion

Choice-specific actions:

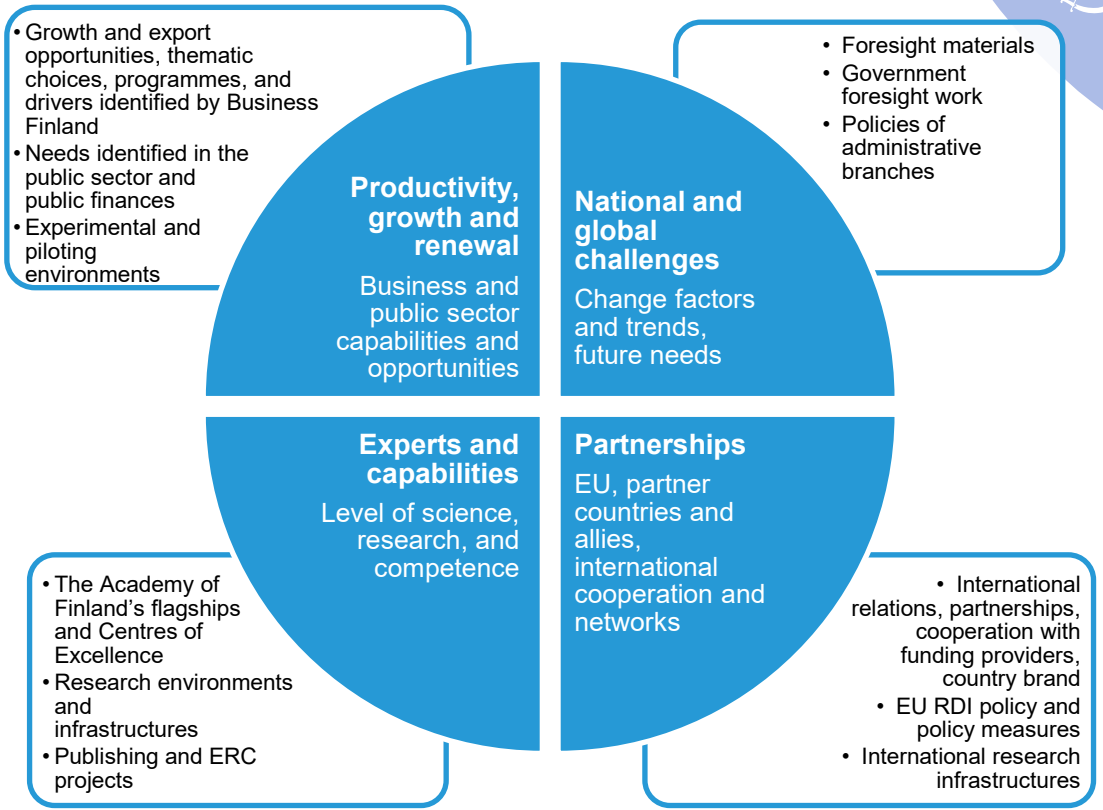
- Existing and planned policy measures will be utilised in the choice areas.
- If necessary, policy measures will be supplemented.
- Implementation plan for choices in September 2025

Starting points for preparation

- The starting points for the preparation have been the work of the parliamentary RDI working groups and the policy outline of the multiannual plan for the use of government R&D funding: In R&D and the direction of R&D activities, global and national societal challenges and the opportunities these create for RDI stakeholders will be identified, taking Finland's strengths into account.
- The proposed choices are promising growth areas, and worthy of consideration for Finland from the perspectives of competence, global demand, competition factors and societal significance.
- The strengths identified by the Academy of Finland and Business Finland, the choices already made and foresight data have been utilised in the preparation.
- The detail size of the choices must be such that they support decision-making in different areas and allow for different approaches and new openings. The choices do not reach the sector or technology-specific level.
- The selections are interlinked and partly overlapping. Effective RDI activities are also created between them.
- Choices are made continuously in the RDI system. National choices will support the long-term outlook needed by companies, investments, research and development activities, and scientists.
- The current process is being performed for the first time. We will learn from this process and develop it in the future.
- The Research and Innovation Council will continue to monitor the operating environment.
  The identification and definition of choices will continue in the coming years as necessary.

Viewpoints for identifying choices

- When identifying choices, four perspectives are taken into account (see figure). The exterior circle shows examples of materials and sources related to perspectives.
- Choices aim at entities that meet 3-4 perspectives.
- In addition, cross-cutting choices are examined.



Proposed strategic choices

Choices aim for sustainable growth, productivity, and renewal, and to strengthen overall security, and resilience.

Strategic choices

Cross-cutting

- RDI system: increasing risk-taking capacity and attracting investments
- Data and data-based value creation
- Resilience

Thematic

- Emerging and disruptive technologies, dual use, and defence
- Health and wellbeing
- Climate, environment and the Arctic dimension

Things to be taken into account in choices and their implementation

- A key prerequisite for increasing productivity and for the effective implementation of the choices is increasing RDI competence and the number and education level of RDI experts in both the private and public sector
- Multidisciplinary and multi-sectoral work as well as surprising combinations
    - Including the importance of the humanities, social sciences and the creative sector in the sustainable transition and the development and deployment of technologies and innovations
- Intangible value creation, creative expertise as well as commercialisation and innovation expertise
    - Including new business models

Cross-cutting proposals

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RDI system: Increasing the risk-taking capacity of RDI activities (1/2)

In order to create new research-based initiatives, radical creativity and innovations, it must be possible to combine phenomena and issues open-mindedly in science and research. It must be possible to break through the boundaries between scientific and research fields with surprising, risky combinations. The risk-taking capacity of researchers, research organizations and companies must be strengthened. This requires predictable and long-term funding environment, incentives for risk-taking RDI activities and ambitious co-development between companies and research organizations.

Our RDI system's key challenges include a lack of long-term funding, a growing shortage of experts, slow productivity growth and the narrow foundation of our economic structure. The uncertainty of research funding weakens the attractiveness of research careers in the eyes of both Finnish and international experts. However, the availability of relevant expertise and experts is a key factor in strengthening the RDI activities of companies and the renewal of business life. The previous parliamentary work has underlined that improving the long-term nature of funding, the basic funding of science and higher education institutions and the attractiveness of research careers are important.

The core funding of higher education institutions enables risk-taking to the extent that the funding has not been allocated to predetermined themes, and higher education institutions use it to encourage creative research initiatives. With regard to competitive funding, the Academy of Finland has set itself the objective of improving its ability to support initiative that are innovative and include scientific-risk. It must be ensured that funding of RDI activities, enables radical innovations and new surprising research openings and combinations.

There must be a balance between competitive funding and core funding of science. Risk funding for research must be available at all stages of a person's research career.

RDI system: Increasing the risk-taking capacity of RDI activities (2/2)

Funding must also enable mobility and cooperation between different sectors. The culture of research organisations must thus be developed towards more long-term and strategic direction. There is also room for improvement in the risk-taking capacity of RDI activities, for example in cooperation between small and medium-sized enterprises and RDI actors as well as in the implementation of new business models. Efforts must be made to ensure that new knowledge and technology, expertise and other prerequisites for RDI activities spread faster and more widely in companies.

RDI system: Attracting RDI investments to Finland

Research and development investments by large Finnish companies are already significant. Despite the willingness of small and medium-sized enterprises and start-ups to increase R&D activities, it is challenging to achieve Finland’s R&D target through national measures alone. For this reason, Finland's attractiveness for RDI investments must be improved in the eyes of both large foreign companies and Finnish companies that are considering the placement of RDI investments. A prerequisite for this is a high-quality operating environment, which renews continuously, is globally recognised and attracts international experts and companies. Finland’s country brand as a stable, reliable and responsible country as well as its top-level research, available RDI experts and internationally competitive research environments and infrastructures form the basis for Finland’s appeal.

Competition for RDI investments and experts has become increasingly globalised and will continue to intensify. Attracting RDI investments to Finland’s areas of strength in RDI activities and competence base must be developed.

Attracting investments must particularly support initiatives in the areas of strategic choices in national RDI policy and activities and strengthen Finnish competence.

Building strong, long-term partnerships not only nationally, but also at the business and research organisation levels is at the core of attracting RDI investments to Finland. To achieve this, cross-sectoral support for international RDI investments must be strengthened. There is a need to increase shared understanding of RDI country brand work and existing strengths. Support for partnerships and country branding are based on research of high-quality by international standards, highly educated RDI experts and RDI cooperation.

Data and data-based value creation (1/2)

Finland has extensive data resources and good preconditions for their better utilisation. Efficient use of data in RDI activities and data-based value creation will improve Finland's competitiveness as well as export and growth opportunities for companies. Data is also a significant commodity for public finances. In the future, more and more attention will be paid to the independence of data infrastructures. The utilisation of artificial intelligence, data analytics and machine learning will strengthen Finland's position as a pioneer in health and environmental solutions, the clean and green transition and the development of private and public services. Augmentedm and virtual reality are also important areas.

Growth, opportunities, and partnerships

The importance of data and data sharing for RDI activities and the competitiveness, exports and growth of companies has increased. Data-based value creation will accelerate growth by utilising artificial intelligence, predictive analytics and new business models, improving resource efficiency and creating new markets. Scalability and international growth and export opportunities are key aspects of data-driven value creation. By improving the efficiency of production processes, the utilisation of data will promote a sustainable transition. The use of data in the creative and service sectors will also provide preconditions for digital business models, and the development of customer experience and value chains. The utilisation of data improves the efficiency of public sector activities and partnerships with private sector. The prerequisites for data-driven growth include sufficient investments in data by RDI actors, information security, ethics and predictive regulation, which will help Finland to secure its position as a global technology leader and pioneer in the application of technology.

RDI system competitiveness and attractiveness factors are the prerequisites for producing, combining and utilising data. The quality of high-performance computing environments and data transmission networks is a strength in attracting international experts, companies and RDI investments to Finland as well as in international RDI cooperation. Data management infrastructures and

Data and data-based value creation (2/2)

the combinability of data, including data transfer connections and the regulatory environment, must be ensured in order to utilise the data. Data must be reliable and reusable. The use of both public and private data in research should be made efficient. The effects of the ICT sector on climate and nature need to be taken into account.

Capabilities

Finland has strengthened its RDI activities with significant investments in data utilisation, competence, high-performance computing and artificial intelligence, which has brought key European research environments and infrastructures to Finland. In this way, Finland has improved its competitiveness in international RDI networks, top research, technological development and the commercialisation of innovations. High-performance and quantum computing, and artificial intelligence infrastructures support multidisciplinary solutions in the health and wellbeing sector, climate and environmental research and industrial digitalisation, while strengthening Finland's attractiveness for international talents and investments. There are companies in Finland that are at the forefront of data-driven business. They also serve as references for attracting international RDI investments and strengthening the global competitiveness of the Finnish data economy. Finland's reputation as a stable and open society supports the strengthening of data-driven RDI activities.

Resilience (1/2)

Changes and risks in the global operating environment require the strengthening of resilience and competence to change among individuals, companies, and society. Understanding the interdependencies and overall management of risks is an important part of the overall security of society and a prerequisite for economic growth. The competitiveness of Finnish business life, and the innovations, productivity and sustainable growth of companies will require competence that renews business operations, the ability to change, and the ability to think creatively and produce solutions that are produced with surprising combinations. Renewing resilience and competence to change require research on key global forces of change and the ability of individuals, companies, and society to respond to these.

Growth, opportunities, and partnerships

Competence that meets changing needs has been identified as a key area of strategic competitiveness and resilience to change in Europe. A clean, green and digital transition will require a strong competence base, new kinds of competence, and an ability to change. Risks in the global operating environment, such as the deterioration of security, the threat of wars and conflicts, the development of the global economic system, global warming and biodiversity loss, epidemics and pandemics, demographic change, migration, societal polarisation, the weakening of democratisation and the rule of law, and technological development will challenge both societies and individuals.

New kind of collaboration and resource opportunities will become available in the current geopolitical situation. Global changes in the operating environment create both new requirements and opportunities for the RDI activities of higher education institutions, research institutes, and companies alike. We need societal and social innovations to support transitions. Changes, the related ability and resilience to change, the identification of new structures, operating methods and opportunities, and the need to renew competence will require new multidisciplinary and multi-sectoral research, knowledge, and foresight.

Resilience (2/2)

Capabilities

Overall security has been developed in Finland for a long time, and it is based on cooperation between the public and private sectors. Finland has internationally high-quality multidisciplinary research and RDI cooperation e.g. in the area of future of learning and education.. Research aimed at solutions that respond to societal changes is carried out in areas such as safety, health and wellbeing, reliability, combating polarisation, as well as media and digital literacy. Finland is known internationally as a pioneer of expertise, and as a stable, reliable society.

Thematic proposals

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Emerging and disruptive technologies, dual use and defence (1/2)

Finland must be able to produce and utilise emerging and disruptive technologies to strengthen competitiveness, sustainable growth, renewal, security and international partnerships. Finland must strive to be at the forefront of some of these technologies, while at the same time maintaining the ability and competence for developing and utilising of emerging and disruptive technologies in other areas. Technological development and the utilisation of these technologies also require understanding and management of societal changes. RDI cooperation must support the continuous development of expertise in both the private and public sectors in emerging and disruptive technologies and their application.

Growth, opportunities, and partnerships

In the next few years, we can expect several applications in emerging and disruptive technologies to make a breakthrough and become established as part of business life and society. For example quantum technologies are expected to develop substantially. New technological solutions and the utilisation of data create opportunities for the sustainable growth, renewal, and wellbeing of society.

New technologies and related expertise, and RDI collaboration offer solutions to global challenges and form a key basis for the clean and digital transition, European competitiveness, strategic autonomy, and Finland's international partnerships. Many technologies have dual-use and are critical to security and defence. In the current international security situation, defence involves growth and export opportunities and development needs, including the development of RDI competence in the public and private sectors. At the same time, the applications of emerging and disruptive technologies will bring societal challenges, related to such things as privacy, security, human and fundamental rights, inclusion, and the need for new skills. These must be addressed alongside technological development.

Emerging and disruptive technologies, dual use and defence (2/2)

Capabilities

Finland’s research, top and in-depth expertise, research, technology infrastructures and business activities in several emerging and disruptive technologies are of high quality by international standards. Examples of these technologies include wireless network technologies, high-performance computing, artificial intelligence, photonics, microelectronics, quantum technology, cybersecurity, space technologies, new materials, and biotechnology. The cutting edge of Finnish expertise is sharp but narrow in many areas. The utilisation of emerging and disruptive technologies in society requires a broad competence base in science, mathematics and technology, high quality and extensive education, as well as a strong foundation in industry and business. There is a need to create international level research and technology infrastructures based on top expertise also in the future.

Health and wellbeing (1/2)

Finland must make the promotion of health and wellbeing one of the drivers of societal renewal, productivity, economic growth and the sustainability of public finances. This requires the bold renewal of operations to allow for the utilisation of research data, innovations, artificial intelligence and the data economy. Public services can serve as RDI platforms that accelerate the development, commercialisation and scalability of Finnish health services and technology solutions, such as wellbeing applications, remote care, and diagnostics. Rapid and innovative solutions by private sector actors are in a key role. An investment-attractive environment and internationally sought-after solutions, such as AI-based diagnostic tools and personalized treatments, enable Finland to position itself as a frontrunner. Physical activity, culture, nature as well as inclusion and preventing growth of inequality are not only prerequisites for health and wellbeing, but may also contribute for work ability and economic sustainability, for which RDI activities provide new knowledge, competence, and effective solutions.

Growth, opportunities, and partnerships

Demographic changes, ageing, growth of social inequality, lifestyle development, and changes in the surrounding world challenge health and wellbeing in Finland and globally. The health and wellbeing sector is growing rapidly globally. The digitalisation, data economy and personalized care are progressing fast. The growth in the share of specialised medical care is challenging the entire health care system in Finland and abroad. A transition to preventive and data-driven health care is essential for cost management and improving wellbeing. Finland can serve as an international example of a country where health data is combined with personalised treatment solutions on the basis of strong data protection and ethics. The efficient and sustainable use of resources in social welfare and health care requires the optimisation of service chains and the wider utilisation of digital solutions, and artificial intelligence.

Health and wellbeing (2/2)

Capabilities

Finland has a strong competence base in medicine and other life sciences, health technology, and wellbeing research, including research related to reducing inequality and the health impacts of culture. Scientific research supports both prevention and treatment, while biobanks, extensive health data, and high-performance computing provide a unique foundation for developing new treatments. Finland can establish itself as a global pioneer in the utilisation of genomic data, disease prevention, combined health data, and AI-based treatment solutions in both society and business. Research and technology infrastructures as well as research, testing and piloting environments play an important role.

Climate, environment and the Arctic dimension (1/2)

The triple crisis involving global climate change, biodiversity loss and pollution creates both a need for societal renewal and a competitive and growth advantage related to the global sustainability transition for Finland. At the same time, Finnish space, atmospheric and marine expertise related to the Arctic environment provides a strong foundation for international RDI partnerships and strategic cooperation in the changed geopolitical situation.

Growth, opportunities, and partnerships

Competitiveness, export, and growth opportunities based on a sustainable transition are related to the clean, green, and digital transition, circular economy, a carbon neutral and carbon negative future, climate and nature solutions, sustainable energy system, bioeconomy, and sustainable food production, and a sustainable food system. To support the systemic transition, we need RDI collaboration between business life and research sector. In addition, we need long-term monitoring data as well as research and expertise on societal and economic impacts and solutions, such as regulation and ensuring the fairness of the transition. In addition, expertise in the Arctic environment, space, atmosphere and seas offer opportunities for international growth and cooperation in an operating environment that emphasises strategic competition. The Arctic dimension also involves societal perspectives from security policy to the residents of the region, and the status of indigenous peoples.

Climate, environment and the Arctic dimension (2/2)

Capabilities

Finland has internationally high-quality research and expertise, significant research and technology infrastructures and competitive business activities in climate and nature solutions, the clean, green and digital transition, circular economy, bioeconomy, and the water sector. On the basis of international comparisons, Finland's information resources related to nature and natural resources are extensive. In addition, Finland has competence, existing partnerships and new opportunities for cooperation in themes and technologies related to the Arctic environment, space, atmosphere, and the seas. A strong country brand as a pioneer in clean energy and sustainable technology lays the foundation for new RDI investments, business activities, and for attracting international expertise.

Proposed choices and existing priorities of funders and megatrends

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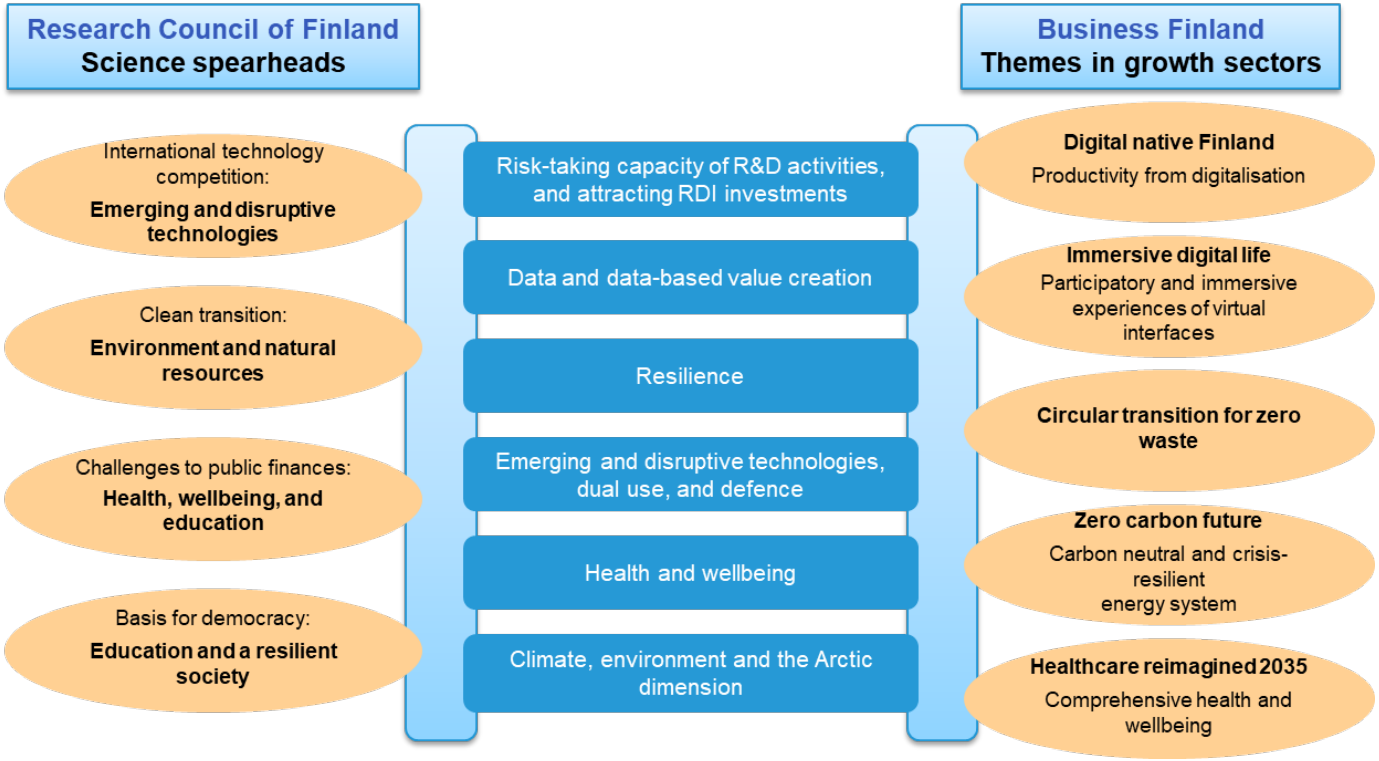
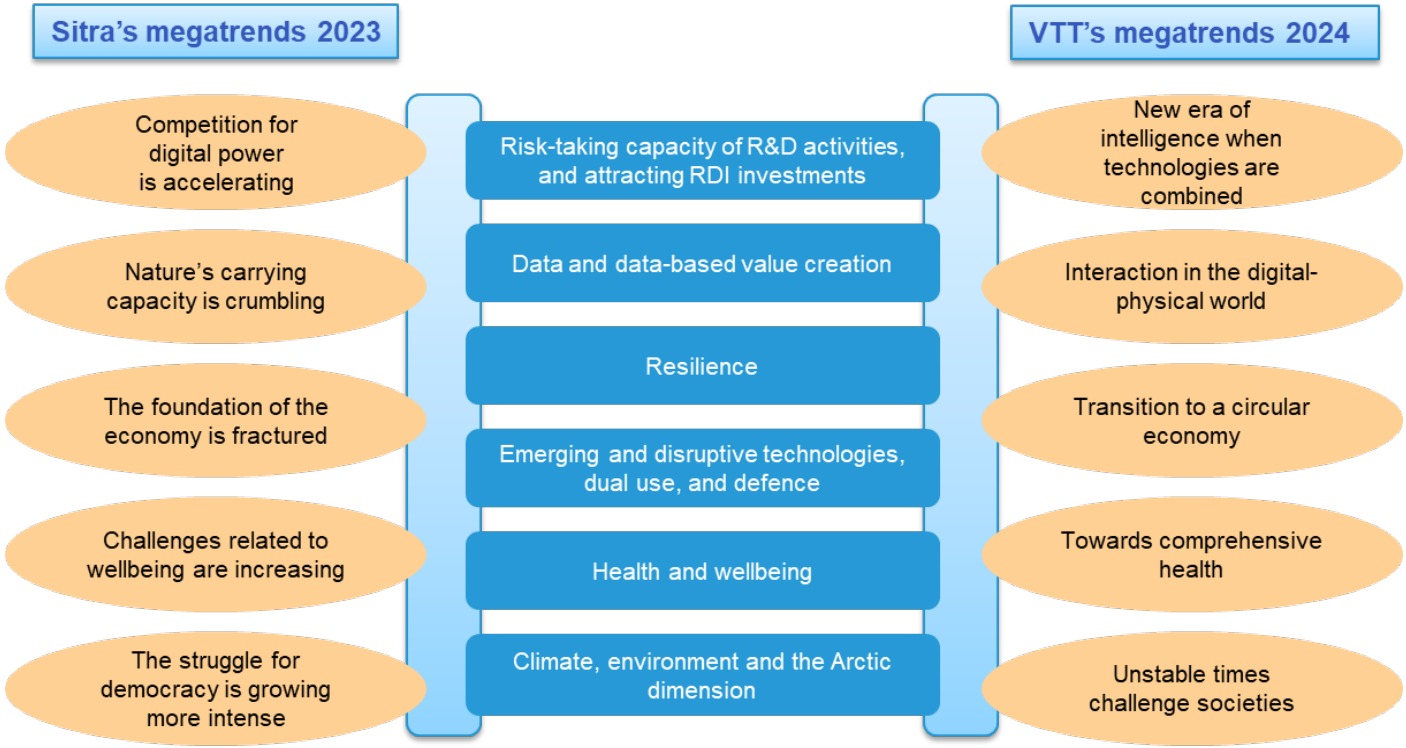
Proposed choices and the existing priorities of Research Council of Finland and Business Finland



Proposed choices and megatrends



Wording of megatrends has been edited.

Sources: Sitra's Megatrends 2023: https://www.sitra.fi/en/publications/megatrends-2023
VTT´s Megatrends 2024: https://www.vttresearch.com/en/news-and-ideas/vtts-trend-report-2024-features-global-megatrends-and-technologies-disrupting