



National strategic choices for RDI policy and activities

Research and Innovation Council



Publications of the Finnish Government 2026:14

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Research and Innovation Council

Finnish Government, Helsinki 2026

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Finnish Government
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ISBN pdf: 978-952-383-058-5
ISSN pdf: 2490-0966

Layout: Government Administration Department, Publications

Helsinki 2026 Finland

National strategic choices for RDI policy and activities

Publications of the Finnish Government 2026:14

Publisher	Finnish Government		
Group author	Research and Innovation Council		
Language	English	Pages	67

Abstract

The national strategic choices for RDI policy and activities aim to boost sustainable growth, promote renewal and strengthen comprehensive security. The strategic choices made by the Research and Innovation Council are the following:

- data and data-based value creation
- disruptive technologies
- health and wellbeing
- climate, environment and the Arctic dimension, and
- security, resilience and defence.

Two overarching priorities were set for developing the RDI system to support the implementation of the strategic choices: increasing risk-taking capacity in RDI and attracting RDI investments to Finland.

In making the strategic choices, the Research and Innovation Council examined the following perspectives:

- 1) productivity, growth and renewal;
- 2) national and global challenges;
- 3) international partnerships; and
- 4) expertise and capabilities.

The preparations related to the strategic choices were carried out openly and with the involvement of various actors in the RDI sector.

The strategic choices support the collection and allocation of public and private RDI resources. The goal is to increase cooperation between RDI actors and administrative branches. To strengthen the conditions for RDI activities and promote the adoption of innovations, it is also important to develop the RDI operating environment. The strategic choices support Finland's efforts to influence EU policy and offer opportunities for Finland to communicate its national strengths more clearly in international forums. The strategic choices will be deepened and specified in concrete terms by a variety of actors. The Research and Innovation Council is responsible for coordinating and monitoring the implementation of the choices.

Keywords research and development, innovation, research policy, innovation policy, research funding, technology policy

ISBN PDF 978-952-383-058-5 **ISSN PDF** 2490-0966

URN address <https://urn.fi/URN:ISBN:978-952-383-058-5>

Kansalliset TKI-politiikan ja -toiminnan strategiset valinnat

Valtioneuvoston julkaisuja 2026:14

Julkaisija Valtioneuvosto

Yhteisötekijä Tutkimus- ja innovaationeuvosto

Kieli Englanti

Sivumäärä 67

Tiivistelmä

Kansallisilla TKI-politiikan ja -toiminnan strategisilla valinnoilla vahvistetaan kestävä kasvua, uudistumista ja kokonaisturvallisuutta. Tutkimus- ja innovaationeuvoston tekemät valinnat ovat:

- data ja datapohjainen arvonluonti
- murrosteknologiat
- terveys ja hyvinvointi
- ilmasto, ympäristö ja arktinen ulottuvuus
- turvallisuus, resilienssi ja puolustus.

Valintojen toimeenpanon tueksi määriteltiin kaksi TKI-järjestelmän kehittämisen kärkeä: TKI-toiminnan riskinottokyvyn lisääminen ja TKI-investointien houkuttelu Suomeen.

Valinnat tehtiin tarkastelemalla seuraavia näkökulmia:

- 1) tuottavuus, kasvu ja uudistuminen,
- 2) kansalliset ja globaalit haasteet,
- 3) kansainväliset kumppanuudet sekä
- 4) osaajat ja kyvykkyydet.

Valmistelu toteutettiin avoimesti ja eri toimijoita osallistaen.

Valinnat tukevat julkisten ja yksityisten TKI-voimavarojen kokoamista ja suuntaamista. Valinnoissa lisätään TKI-toimijoiden ja hallinnonalojen yhteistyötä. TKI-toiminnan edellytysten ja innovaatioiden käyttöönoton vahvistamiseksi on tärkeää kehittää myös toimintaympäristöä. Valinnat tukevat Suomen EU-vaikuttamistyötä ja antavat mahdollisuuksia viestiä kansainvälisillä foorumeilla aiempaa selkeämmin kansallisista vahvuuksista. Valintoja syvennetään ja konkretisoidaan eri toimijoiden yhteistyössä. Tutkimus- ja innovaationeuvosto yhteensovittaa ja seuraa valintojen toimeenpanoa.

Asiasanat

tutkimus- ja kehittämistoiminta, innovaatiotoiminta, tutkimuspolitiikka, innovaatiopolitiikka, tutkimusrahoitus, teknologiapolitiikka

ISBN PDF 978-952-383-058-5

ISSN PDF 2490-0966

Julkaisun osoite <https://urn.fi/URN:ISBN:978-952-383-058-5>

Nationella strategiska val för FUI-politiken och FUI-verksamheten

Statsrådets publikationer 2026:14

Utgivare	Statsrådet		
Utarbetad av	Forsknings- och innovationsrådet		
Språk	Engelska	Sidantal	67

Referat

En hållbara tillväxt, förnyelse och övergripande säkerhet stärks med nationella strategiska val inom FUI-politiken och FUI-verksamheten. De val som Forsknings- och innovationsrådet gjort är

- data och värdeskapande som bygger på data
- disruptiva teknologier
- hälsa och välfärd
- klimatet, miljön och den arktiska dimensionen
- säkerhet, resiliens och försvar.

För att stödja genomförandet av valen fastställdes två fokusområden för att utveckla FUI-systemet: Att stärka risktagningsförmågan för FUI-verksamheten och att locka FUI-investeringar till Finland.

Valen gjordes genom att granska följande perspektiv:

- 1) produktivitet, tillväxt och förnyelse,
- 2) nationella och globala utmaningar,
- 3) internationella partnerskap samt
- 4) experter och förmågor.

Beredningen genomfördes öppet och genom att engagera olika aktörer.

Valen bidrar till att sammanställa och rikta offentliga och privata FUI-resurser. Vid valen ökas samarbetet mellan FUI-aktörerna och förvaltningsområdena. Det är viktigt att också utveckla verksamhetsmiljön för att stärka införandet av FUI-verksamhetens förutsättningar och innovationer. Valen bidrar till Finlands EU-påverkan och ger möjligheter att tydligare än förut meddela om de nationella styrkorna på internationella forum. Valen fördjupas och konkretiseras i samarbete mellan olika aktörer. Forsknings- och innovationsrådet samordnar och följer upp genomförandet av valen.

Nyckelord forsknings- och utvecklingsverksamhet, innovationsverksamhet, forskningspolitik, innovationspolitik, forskningsfinansiering, teknologipolitik

ISBN PDF 978-952-383-058-5 **ISSN PDF** 2490-0966

URN-adress <https://urn.fi/URN:ISBN:978-952-383-058-5>

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1 Introduction

Finland has a unique national objective to significantly increase research and development activities in this decade. When deciding the common objective, a parliamentary working group on RDI also agreed on the need to identify the national strategic priorities for RDI policy and activities.¹ Prime Minister Petteri Orpo's Government and the Research and Innovation Council are now implementing these policy guidelines. The Government is committed to the national target of increasing Finland's research and development expenditure to four per cent of Finland's GDP by 2030. Under the Act on State Financing of Research and Development 2024–2030, state R&D funding will rise to 1.2 per cent of GDP, provided that investments by businesses account for two-thirds of R&D spending².

The Government will accelerate progress towards the four per cent target during this parliamentary term through annual additional investments in the R&D activities of higher education institutions, research organisations³ and businesses. R&D investment is aimed at achieving sustainable economic growth, long-term renewal and productivity gains in Finland, as well as stability and a predictable outlook for the whole RDI system. Additional R&D funding will strengthen Finland's knowledge capital and provide better conditions to respond to societal and global challenges.

In June 2024, the Government decided on the objectives of the RDI system and on the main policies for the use of R&D funding in the multiannual plan for the use of government research and development funding⁴. The making of national strategic choices is one of the main policy guidelines of the plan. National strategic choices for RDI policy and activities are made on the basis of, and by refining,

1 In the context of the national strategic choices, this report refers mainly to research, development and innovation (RDI) activities. However, in some places, research and development (R&D) activities and their financing are discussed in a more limited scope, in line with the scope of the Act on State Financing of Research and Development 2024–2030.

2 Act on State Financing of Research and Development 2024–2030 (1092/2022), <https://www.finlex.fi/fi/lainsaadanto/2022/1092>

3 The term 'research organisations' is used here to refer broadly to a variety of entities performing RDI, including state research institutes, wellbeing services counties and privately funded organisations.

4 Finnish Government, 2024a.

the multiannual plan. They support the achievement of the objectives, and the implementation of the main guidelines, set out in the plan in the selected areas, as well as pointing the way ahead for national and international actors considering RDI investments. The strategic choices provide a basis for businesses, researchers, higher education institutions, research organisations and other actors to orient RDI activities and cooperation.

Long-term RDI activities provide a strong basis for responding to rapid changes and needs in the operating environment. The significant impacts and effectiveness of RDI activities mainly occur in the medium to long term. Impact is a complex phenomenon that arises from the interaction between research evidence and other factors. During this parliamentary term, funding will be allocated as outlined in the multiannual plan, with a particular focus on strengthening RDI cooperation between businesses, higher education institutions and research organisations in order to accelerate the transfer of competences and the latest knowledge, thereby also supporting economic growth in the near future. The national strategic choices are areas where the strengthening of cooperation offers opportunities to create in Finland internationally competitive research and competence clusters as well as innovation and business ecosystems that are also able to respond to increasingly complex global challenges.

The strategic choices are based on existing national strengths in science and RDI, the capabilities and needs of businesses and society, and Finland's capability to harness global changes. On the one hand, the choices provide companies, research organisations, researchers and international entities with a view into the knowledge and strengths that Finland has and regarding which national and international cooperation can be further strengthened. On the other hand, the areas covered by the choices offer many opportunities to exploit the high level of Finnish expertise and produce solutions to global challenges and growing markets.

The strategic choices create the conditions for proactive, long-term national development efforts. These choices guide different actors towards the same priorities. The areas covered by the choices need open-minded, bold and new innovative RDI activities and investment. The implementation of the choices will pool and target private and public resources, develop the regulatory environment, increase cooperation between RDI actors and branches of government, strengthen international and EU partnerships and improve Finland's access to EU RDI and growth funding. The pooling of resources can also influence R&D incentives and increase the effectiveness of public R&D funding. The strategic choices are part of the development of the RDI system and R&D funding as a whole, with a researcher-driven and business-driven approach remaining the norm. Researchers are free to

choose their research topics, and companies make decisions regarding their RDI activities based on their own circumstances. Significant science is also done and research, development and innovation carried out outside the choices.

Achieving the objectives set requires a strategic approach, a long-term perspective and a commitment to implementing the strategic choices. At the same time, the management and coordination of RDI policy must be strengthened as part of government decision-making and joint, systematic preparation by branches of government. The reformed Research and Innovation Council, which is based on parliamentary guidelines, will play a key role in this. The Research and Innovation Council has prepared the national strategic choices in broad consultation with the RDI community, and will monitor their implementation in cooperation with the Parliamentary RDI monitoring group.

2 Snapshot of the operating landscape

Global crises and disruptions, international strategic competition, the promotion of sustainability transitions and the need to strengthen security and resilience are strongly influencing the development of research and innovation policies at national and international level.⁵ Meeting major global challenges and making use of the new opportunities they open up depend crucially on high levels of knowledge, research and innovation. This is why several countries and the European Union are considering strategic priorities for RDI and the necessary new investments.⁶ The strategic choices in RDI activities also respond to the international debate on forming new partnerships. The so-called Heitor report to the European Commission calls for a more selective approach to international RDI cooperation in the European Union to enable Member States to cope with an increasingly complex and changing geopolitical environment. The same countries can be partners, competitors or systemic adversaries, and a country can be all of these in different areas of research, development and innovation (e.g. climate change, electric vehicles or high-tech semiconductor chips).⁷ This requires a new kind of approach to RDI policy and a definition of who Finland's partners are in the different areas and issues of RDI.

-
- 5 "Sociotechnical systems in areas like energy, agrifood and mobility need to transform rapidly to become more sustainable and resilient. Science, technology and innovation (STI) have essential roles in these transformations, but governments must be more ambitious and act with greater urgency in their STI policies to meet these challenges. They should design policy portfolios that enable transformative innovation and new markets to emerge, challenge existing fossil-based systems, and create windows of opportunity for low-carbon technologies to break through. This calls for larger investments but also greater directionality in research and innovation, for example, through mission-oriented policies, to help direct and compress the innovation cycle for low-carbon technologies. International co-operation will be essential, but rising geopolitical tensions, including strategic competition in key emerging technologies, could make this difficult." OECD (2023); see also Draghi (2024) and the European Commission (2025a).
- 6 See Chapter 8 RDI choices of other countries and e.g. the recent IVA (2025): Sweden's Competitiveness and Investment Priorities.
- 7 European Commission (2024), see proposal No 11 of the source.

The European debate on thematic priorities for RDI policies and activities is ongoing, for example in the context of the preparation of the EU Multiannual Financial Framework for 2028–2034, the European Competitiveness Fund and Horizon Europe.⁸ In January 2025, the Commission presented a roadmap called the competitiveness compass to reinvigorate the European economy and boost economic growth.⁹ The compass identifies closing the innovation gap between the EU and its peers, decarbonising the economy and reducing supply chain dependencies as necessary conditions for improving EU competitiveness. The Commission's proposal for the European Competitiveness Fund, published in July 2025, identified four policy windows: 1) clean transition and industrial decarbonisation, 2) health, biotechnology, agriculture and bioeconomy, 3) digital leadership and 4) resilience, security, defence industry and space. In the Commission's proposal for Horizon Europe, published at the same time, these are complemented by a 'fifth policy window': investigator-driven frontier research, in particular on global societal challenges such as migration, disinformation, democratic backsliding and social inclusion. The Commission also proposed that the framework programme should allow for dual-use applications by removing the exclusive focus on civilian applications. The proposal puts particular emphasis on support for high-risk RDI activities, in particular for the European Innovation Council. The Commission's proposals for the Competitiveness Fund and the Horizon Europe programme will be discussed by the EU Council and the European Parliament, with decisions expected in 2027 at the latest.

Science and technology also play a key role in NATO as a basis for prosperity, progress and security.¹⁰ In NATO, key trends in the science and technology environment include the rise of artificial intelligence, data and quantum technologies, disruptive biotechnologies, limited natural and other resources, erosion of societal trust, and the interconnectedness and interdependencies of technologies. Identified cross-cutting themes include the weakening of the international rules-based system, climate change, global partnerships and the growing role of the private sector.¹¹

8 See https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034_en

9 European Commission (2025b).

10 NATO, 2025. NATO Science & Technology Strategy – Defending the future, today!

11 NATO Science and Technology Organization (2025). NATO Science & Technology Trends 2025–2045. Volume 1.

2.1 Challenges of a changing operating environment

The preparation of the strategic choices was based on the parliamentary policy guidelines and the guidelines set out in the multiannual plan for the use of central government research and development funding. In accordance with these, global and national societal challenges and the opportunities they create for RDI actors are identified in R&D activities and in their targeting, taking into account national strengths.

In the preparation of the Government's Report on the Future¹² and in the work of the Government's RDI policy network, the following change factors have been identified as key for Finland's future and for the orientation of Finnish RDI actors. These aspects have served as a key reference framework for preparing the national choices and priorities. Finnish RDI activities can contribute to managing and responding to change, both at national and global level. In monitoring the implementation of the choices, it is possible to endeavour to assess how the different actions and measures resulting from the choices respond to these global and societal changes.

Geopolitics

Global confrontation and tensions between great powers have intensified, affecting security, the economy, technology, security of supply, industry and trade. The EU seeks to strengthen its geopolitical position and strategic autonomy. Europe is at war, the security environment is unstable, and the Arctic is becoming increasingly relevant from a military and critical infrastructure perspective. The importance of the Arctic region is increased by the fact that it is warming almost four times faster than other regions.

Technology competition

Technology competition between countries is increasingly intertwined with the pursuit of geopolitical and economic power, and with security and the information environment. This change is reflected in changes in international relations (the US, China, the EU, Russia, India), growing strategic interest in space and the Arctic, a transformation of the global economic system from globalisation to a geo-economy, and the integration of technological development into geopolitics. The European Union is falling behind the leading edge in science, technological

12 Finnish Government 2024b, 2025.

development and innovation.¹³ The economic and technological leadership of the West is no longer self-evident. To ensure strategic autonomy and room for manoeuvre, and to build partnerships, we need to invest decisively in science, technology and innovation.

Disruptive technologies are transforming everyday life, business, society and the way research is conducted. In many countries, the aim is to accelerate science and innovation through AI. The dual use of technologies, that is, their use for both civilian and military purposes, is on the rise. In particular, combinations of several advanced technologies and the new solutions they generate have the potential to influence the emergence of new markets and societal disruption. Technological leaps are expected to create new growth for the national economy, improve productivity and increase wellbeing. The data economy is the fastest growing sector in the EU, but at the same time the value added by Finnish companies in the data economy even declined between 2012 and 2021.¹⁴ Technology is essential for the green transition, though new technologies can also harm the climate and environment. Space activities are becoming more important for everyday services and military operations. Global technology companies have become major wielders of power. Digitalisation is changing people's daily lives at an unprecedented pace.

Economy and productivity

In recent years, the international economic system has faced one surprise after another. Protectionism is prevalent, and there is a tendency to strengthen strategic industries, for example through state aid.

At the same time, there are significant adjustment needs in public finances and expectations of a greater role for the state. High debt levels and deficits on the one hand, and increasing spending on security, defence and age-related expenditure on the other, are key problems for an increasing number of European countries. The Finnish economy has not grown sufficiently since 2007. Changes in work and working life, particularly digitalisation and artificial intelligence, force to change the current operating models, production methods and ways of working.

13 See, for example, European Commission (2024): The EU ranks third in the number of scientific publications cited worldwide, after China and the US, falling from 20.7 per cent in 2000 to 17.8 per cent in 2020. Over the last two decades, the EU's share of global scientific publications has fallen from 25.5 per cent in 2000 to 18.1 per cent in 2022. In 2000, the EU accounted for around 30 per cent of global patent applications, but this fell to 17.3 per cent in 2021.

14 Koski et al. (2024).

Challenges for society

The rule of law and democracy have deteriorated globally. The uneven demographic trends on the planet will continue, and the declining fertility rates have economic, political and cultural consequences. Demographic dependency ratios will rise sharply in the coming decades in wealthy countries. Migratory movements have increased and are becoming more important as urbanisation continues.

Inequalities have been on the rise in recent years. Increasing mental health problems, loneliness, physical inactivity and obesity are challenging people's wellbeing. Values and attitudes are becoming more polarised, and religiosity and identities are increasingly diverse in society. In Finland, there is still a general belief in science and its solutions¹⁵, but there are also other perspectives echoing from around the world.

With an ageing population, memory disorders and multi-morbidity are becoming more common, challenging the service system. Cancers, mental health disorders, musculoskeletal diseases and substance abuse are major causes of harm and costs.¹⁶

While education levels have risen significantly in key competitor countries, they have fallen in Finland. In Finland, the proportion of young adults with tertiary education is 39 per cent, which is still below the OECD average of 48 per cent.¹⁷ As skills needs change more rapidly and the importance of innovative RDI activities increases, competition for talent is intensifying.

Sustainable growth and planetary boundaries

Promoting sustainable growth requires a shift to clean energy and production, maximum decoupling from the fossil economy, resource efficiency and a change in consumption patterns. Competition for natural resources, but also biodiversity loss, is inevitably driving towards a more sustainable use of natural resources and a circular economy. This in turn will challenge many business areas.

Transgressions of planetary boundaries pose new and growing risks to human wellbeing and health, to the stability of societies and to the economy. Climate change has already affected the occurrence of extreme weather and climate events

15 Finnish Society for Scientific Information (2024). Finnish Science Barometer 2024.

16 Finnish Institute for Health and Welfare (THL) (2025).

17 OECD (2025a).

all over the world. Biodiversity is being depleted, undermining the ecosystems that sustain life. A globally growing population and environmental degradation are putting pressure on food security and presenting challenges for substitutes to the fossil economy.

3 Objectives and impact of the strategic choices

National strategic choices for RDI policy and activities

- Pool and target public and private resources.
- Create a framework for cooperation.
- Support the strategic decision-making, policy measures, and influencing EU policy by the Government and various branches of government.
- 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.

3.1 Objectives and impact pathways

Investment in R&D aims to have a broad and long-term impact by boosting sustainable growth, strengthening knowledge and competitiveness, increasing productivity, renewing society and addressing societal and global challenges. The multiannual plan for the use of central government research and development funding will guide the direction of additional funding in the coming years. The national strategic choices for RDI policies and activities are made and implemented on the basis of, and by refining, the multiannual plan.

The parliamentary work emphasised the need for a broad and participatory preparation of the choices, in order to maximise their impact. At their best, these choices will support the strengthening and emergence of internationally competitive research and competence clusters and ecosystems. This requires commitment from both the private and the public sector.

A key objective of Finnish RDI policy is to create a more long-term and predictable vision for companies, researchers and other actors to commit to selected priorities. The strategic choices pool and focus public and private resources and strengthen the framework for cooperation. They support the strategic decision-making, policy measures, and influencing EU policy by the Government and various branches of government. The choices support RDI actors – companies, research organisations and researchers – and RDI funding bodies in their own decision-making, orientation of activities, funding applications and system development. In addition, the choices also contribute to the regional and local development of RDI activities, as well as increasing the synergies of actions.

The implementation of the strategic choices has impacts over different time horizons. As with RDI activities in general, the most significant impacts and effectiveness will materialise primarily in the medium to long term. Short-term impacts can be achieved by focusing on existing strengths, on strengthening RDI cooperation and on areas close to the market. By strengthening these areas and the internationally stronger and more competitive clusters they form, new RDI-based growth can be generated. At the same time, societal renewal, the strengthening of knowledge and education, and responding to global challenges through RDI activities require a longer time horizon, greater risk-taking and new research openings.

The national strategic choices direct resources towards issues and areas in which RDI activities are to be strengthened. The choices do not provide detailed guidance on research fields or themes, nor do they involve picking winning technologies or sectors. As noted in the parliamentary work: “In allocating support, existing strengths and society’s strategic objectives may nevertheless be taken into account. The system works on a bottom-up basis, whereby public RDI funding is channelled in ways that facilitate the emergence of new and unexpected actors and industries.”¹⁸

18 Parliamentary RDI Working Group (2021, 49).

The key impact pathways for the choices are as follows:

Targeting R&D funding and strengthening competence clusters

Government funding for research and development, including additional funding under the Act on State Financing of Research and Development 2024–2030, is allocated to R&D as part of the public finances planning and budget process. The strategic choices are taken into account when allocating state and other public R&D funding. Government R&D funding and other measures will encourage the private sector to direct its investments towards the areas covered by the choices.

The importance of additional government R&D funding in total R&D funding will increase cumulatively by 2030, when it will account for almost half of total funding (see Figure 3 in the Annex). It is therefore justified, where appropriate, to strengthen the impact of the choices by allocating additional government R&D funding to them.

The private sector accounts for around two-thirds of the R&D expenditure in Finland (see Figure 4 in the Annex). The effectiveness of the choices is strengthened when, in addition to public funding, the areas covered by the choices attract both domestic and foreign private RDI investments. The choices help the private sector to make its own investment decisions, when it is known that the development of the knowledge and business ecosystems covered by the choices will be supported nationally.¹⁹ Research and technology infrastructures²⁰ act as attraction factors,

19 Working group on sustainable development (2021). This so-called Ala-Pietilä working group stressed, already before the decisions on R&D funding increases, that: “Returning the scale of RDI activities to the world’s top tier is alone not enough. It must be possible to use investments effectively. What is essential here is that the contributions of different actors support each other, harness synergies and create self-reinforcing loops and build expertise. This will be most likely to happen when investments are directed towards ecosystems consisting of different actors. The actors should, as a rule, represent strong expertise: companies, research organisations and higher education institutions. The state cannot create ecosystems. However, it can identify them and, through its own action, support them, or the early stages of such ecosystems.”

20 See for example the website Research Council of Finland: <https://www.aka.fi/en/research-funding/funding-opportunities2/programmes-and-other-funding-schemes/research-infrastructures/>. At EU level, see the European Strategy on Research and Technology Infrastructures: https://research-and-innovation.ec.europa.eu/strategy/strategy-research-and-innovation/our-digital-future_en/european-strategy-research-and-technology-infrastructures_en

and major national infrastructure investments demonstrate Finland's long-term commitment to their development. This, in turn, strengthens the message about Finland's expertise and areas of strength.

Regional RDI investment decisions have a more secure basis when it is known that RDI activities in the area of choice are a national priority. Universities, research organisations, universities of applied sciences, wellbeing services counties and cities also make their own strategic orientation decisions, and these decisions are supported by the long-term national RDI choices.

The Research Council of Finland and Business Finland will implement the choices in their operations, and their existing priorities and strategies support implementation. Closer cooperation with funding bodies is a key long-term objective of RDI policy. According to the Government Programme, R&D funding will be targeted using both existing funding instruments, such as funding for leading companies and flagships, and new joint programmes launched by RDI funding organisations.²¹ Cooperation between the main R&D funding bodies in the areas covered by the choices can be enhanced, for example by developing joint and parallel programmes to support the strengthening of research-driven and business-driven ecosystems. The Research Council of Finland and Business Finland will review their cooperation on the strategic choices in the implementation stage. This will take into account the different roles of funding organisations and the impact timeframes of the activities: the Research Council of Finland funds long-term scientific research, and Business Finland supports activities closer to the market.

Strengthening RDI cooperation in the areas covered by the choices

A key priority for national RDI policy and R&D funding is to strengthen RDI cooperation.²² Increasingly close cross-sectoral cooperation is a suitable model in Finland's low-hierarchy, open and interactive society and, at best, can provide a significant competitive advantage over key competitor countries.²³ Greater cooperation between higher education institutions, research organisations, businesses and other actors in the areas covered by the choices will increase the impact of the choices.

21 Finnish Government (2023, p.111).

22 See, for example, the final report of the Parliamentary Working Group on Research, Development and Innovation 2022 (RDI Working Group 2023) and the Multiannual plan for the use of government research and development funding (Finnish Government 2024a).

23 Research and Innovation Council (2025).

Cooperation makes it possible to share costs and risks among a wider range of actors. The choices will create and strengthen RDI ecosystems and competence clusters, where the cooperation between research organisations, higher education institutions and businesses is strengthened. Such clusters can be built on Business Finland-funded leading company (Veturi) projects, flagships funded by the Research Council of Finland and other nationally significant collaborative projects.

Strengthened cooperation has a significant impact on increasing knowledge flows and two-way transfer of knowledge between higher education institutions and research organisations and companies. Increasing RDI competences are a prerequisite for the impact of the choices. Important actions include increasing the number and education level of RDI specialists in both the private and the public sector, developing doctoral education and strengthening cooperation between RDI actors. Finland's R&D target of four per cent also requires a significant increase in the number of R&D personnel in companies. A strong role of companies in doctoral education and the post-doc phase would increase experts' business capabilities and the transfer of knowledge to companies, thereby strengthening RDI activities more broadly.

Internationally, the strategic choices support the building of cooperation networks with foreign partners. The choices offer a long-term perspective on the issues that Finland is committed to developing and strengthening.

The implementation of the choices will be supported by joint actions by different branches of government and policy areas. They can be timed in a coordinated way to ensure that they are as resource-efficient as possible, while ensuring the broadest possible impact. More on the implementation model in Chapter 6.

International cooperation and advocacy

"Finland needs more internationally high-level and effective competence clusters, whose development and creation require not only broad-based expertise but also choices. International cooperation with strategically significant partners will become increasingly important. For example, EU funding programmes and partnerships are important instruments that determine the direction of European technological development, and Finnish actors need to be actively involved in them,"²⁴ the Parliamentary RDI Working Group noted.

24 Parliamentary RDI Working Group 2022 (2023, 42).

The national strategic choices for RDI activities help communicate internationally Finland's priorities, strengths and willingness to cooperate. In particular in country branding, Finland's strengths have not, to date, appeared as clear, coherent long-term strengths in international comparisons. The strategic choices will also thereby support export efforts, the attraction of significant international RDI investment and the strengthening of Finland's country brand.

The importance of RDI cooperation in the European Union for Finnish RDI actors continues to grow. International partnerships are needed to address societal challenges and the twin transition. The goal of doubling the amount of EU R&D funding channelled to Finland is ambitious and requires a variety of actions, including that influence is exercised on funding priorities and work programmes in a timely manner. The opportunities for Finnish RDI actors to secure EU funding can be facilitated by ensuring, through multiple channels, that the national strategic choices are visible in European cooperation and in the setting of objectives. The strategic choices support Finland's efforts to influence EU policy, which are pursued not only at political level but also by public officials and various stakeholders.

3.2 Basis for identifying the strategic choices

The preparation of the strategic choices was based on the parliamentary policy guidelines and the framework set out in the multiannual plan for the use of central government research and development funding. Within this framework, R&D activities and their targeting involve identifying global and national societal challenges and the opportunities they create for RDI actors, having regard to Finland's strengths.

In the strategic choices, promising growth areas have been identified that are relevant for Finland in terms of expertise, global demand, competitiveness and societal relevance. The preparatory work has drawn, for example, on the national strengths identified by the Research Council of Finland and Business Finland, the

choices already made in RDI and its funding, and foresight work and materials²⁵. In addition, information on Finland's country brand has also been used. According to international image survey data, Finland's strengths that are highlighted among those familiar with the country include a strong level of education, safety, social innovations that support wellbeing, natural values and technological development.²⁶ The most important factors for investing in Finland are a favourable business environment, environmental protection and technological progress.²⁷

Choices are made in the RDI system all the time – from decisions made by RDI funding bodies to strategy-driven decisions made by companies and research topics chosen by individual researchers. The strategic choices are about building strong ecosystems, a strong knowledge base and research knowledge, and increasing the impact of RDI activities. The Ala-Pietilä working group, which 2020–2021 examined the conditions for sustainable economic growth and the future of wellbeing, said: “to be effective, a choice must rely in particular on the views and input of companies, but also of the research community, and it must not result in overly prescriptive steering or in picking winners.”²⁸ In the parliamentary work, it was noted that “the main task of the strategic choices is to form a common national view of the growth areas that are noteworthy for Finland either in terms of strategic competence, global demand, competitive factors or relevance. This involves creating a common knowledge base and understanding to underpin decisions promoting sustainable growth in both the public and private sectors. To ensure commitment and impact, it is essential that the vision and the strategic choices

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- 25 The materials used include the strategic operating environment analysis presented in the Government Report on the Future (Finnish Government 2024b, 2025), Sitra's megatrends (Sitra 2023) and its foresight work on changes in the security environment (Sitra 2024a), VTT's megatrends (VTT Technical Research Centre of Finland Ltd 2024), the drivers of change in the operating environment identified by VTT (VTT Technical Research Centre of Finland Ltd 2023), themes for strategic research, the Industrial Policy Strategy (Ministry of Economic Affairs and Employment 2024a), the strategic priorities, sectors and competence clusters of actors within the government branch of the Ministry of Economic Affairs and Employment (2024b), population projections by Statistics Finland and the Ministry of Finance (Ministry of Finance 2024), material from the Finnish National Agency for Education's National Forum for Skills Anticipation, the European Commission's objectives and priorities, and Draghi's (2024) report 'The Future of European Competitiveness'.
- 26 Research and Innovation Council (2025): The study is based on four major international image surveys (Global Soft Power Index 2024, Anholt Nation Brands Index 2024, Bloom Consulting 2022 Countries, Regions and Cities, RepCore Nations 2024 G7– Finland – A country reputation analysis).
- 27 Research and Innovation Council (2025), more specifically RepCore Nations 2024.
- 28 Ministerial Working Group on Sustainable Growth (2021, 14).

supporting it are prepared on a broad basis. Cooperation with non-RDI actors is also important, including those whose lives and activities are significantly affected by sustainability transitions.”²⁹

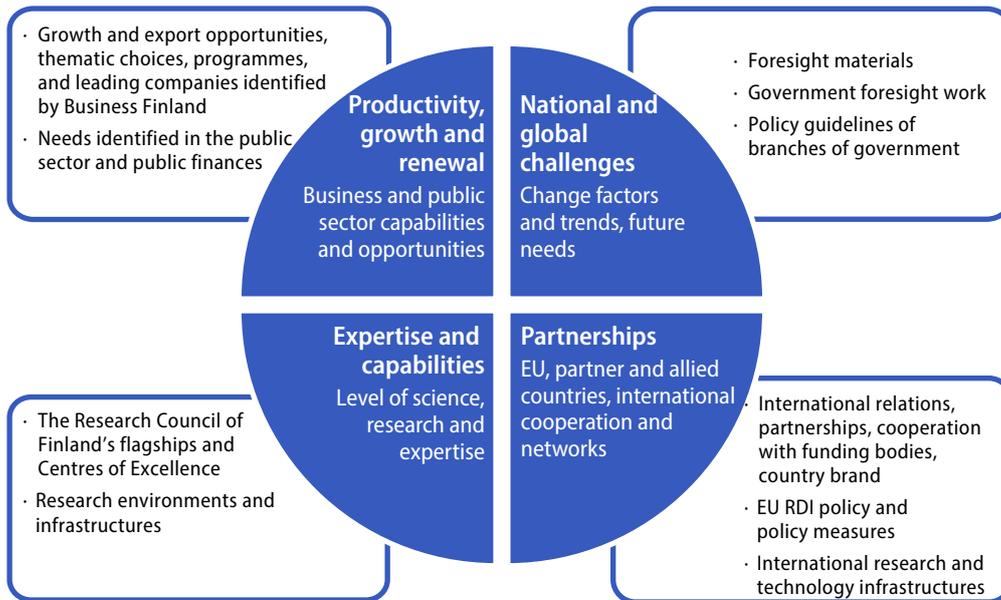
When identifying the choices, four aspects were taken into account (Figure 1): 1) productivity, growth and renewal; 2) national and global challenges; 3) international partnerships; and 4) expertise and capabilities. In the overall mix of choices, the aim has been to ensure that each choice is relevant to Finland and justified from these four aspects. In addition, specific spearheads for the development of the RDI system were identified. These are areas that require special attention in implementing strategic choices and developing the competitiveness of the Finnish RDI system.

The choices were prepared with a view to ensuring that their degree of specificity supports decision-making on different fronts and allows for different approaches and new openings. The choices do not extend to the level of individual sectors or technologies. The choices are interconnected and partially overlapping, and impactful RDI activities also emerge in the interfaces between them. The implementation phase deepens and concretises the choices and their objectives, and brings together actions and resources to implement them.

The process to prepare the choices launched in autumn 2024 was the first such process to be carried out at national level. The intention is for lessons to be learned from the process and for it to be further developed in the future. The Research and Innovation Council monitors developments in the operating environment. The identification and definition of choices will continue in the coming years, as appropriate.

29 Parliamentary RDI Working Group 2022 (2023, 43).

Figure 1. Perspectives for identifying the strategic choices. When identifying the choices, four aspects were taken into account. The outer ring provides examples of the data and sources relied on in the examination of the aspects.



4 The strategic choices

The national strategic choices for RDI policy and activities are:

- Data and data-based value creation
- Disruptive technologies
- Health and wellbeing
- Climate, environment and the Arctic dimension
- Security, resilience and defence

To support the implementation of the strategic choices, two spearheads were identified for the development of the RDI system:

- Increasing the risk-taking capacity of RDI activities
- Attracting RDI investments to Finland

4.1 The choices as a whole

The choices aim to promote sustainable growth, productivity and renewal as well as to strengthen comprehensive security. Two of the choices, *Data and data-based value creation* and *Disruptive technologies*, are enabling in nature. The other three choices are thematic and constitute application areas for RDI activities. The choices describe *where* RDI activities and national investments and development measures should be directed in Finland, in particular, towards key areas that are significant for sustainable growth, global markets and societal renewal. The spearheads for developing the RDI system, in turn, define *how* national RDI policy should be developed to ensure the effectiveness of implementing the choices.

The choices are interlinked, and impactful RDI activities and ecosystems are created not only within individual choices, but also between them and in different combinations. In many cases, it is likely that RDI activities at the interface between choices offer the greatest potential for breakthroughs and innovation.

The choices are different from each other, but they share many common elements in terms of their content and how they are implemented effectively. These factors include multidisciplinary and cross-disciplinary approaches and the new and

unexpected combinations they enable. For example, the humanities, social sciences and creative industries need to be harnessed in the transition to sustainability, in the development and deployment of technologies and innovations, and in strengthening resilience and societal security. Intangible value creation, new business models and creative skills and expertise in commercialisation and innovation are prerequisites for harnessing the growth, productivity and renewal potential of the choices. Prerequisites for the effective implementation of the choices include increased business investment in RDI, stronger RDI expertise, a larger RDI workforce and higher education levels in both the private and the public sector.

The following sections present each strategic choice together with its main content and associated opportunities and capabilities. This is followed by a description of the spearheads for developing the RDI system and a section on the implementation and monitoring of the choices.

4.2 Data and data-based value creation

Opportunities for growth and renewal:

- Leveraging data and data-driven growth
- AI
- High-performance computing and data management
- Applications in health and environmental solutions, the clean and digital transition, and the development of private and public services

The sustainable business of the future will increasingly rely on data-driven – and more broadly intangible – value creation. The importance of data and data sharing for RDI activities and the competitiveness, exports and growth of companies has increased. Society and the economy are moving towards a data-driven, real-time era of intense automation through artificial intelligence. Operating practices and business models are evolving rapidly. Data is also a significant commodity for public finances. The use of data can improve the efficiency of public sector operations and partnerships with the private sector. By improving production processes and productivity, the use of data will contribute to a sustainable transition.

The use of artificial intelligence and data analytics supports Finland's position as a frontrunner in areas including health and environmental solutions, the clean and digital transition and the development of public and private services. The availability of health and environmental data is an important competitive asset for Finland and warrants systematic utilisation. Data utilisation also covers areas such as virtual and augmented reality. The independence of data and related infrastructures is of growing importance for strategic autonomy, and data and its utilisation may also involve dual-use applications.

Growth, opportunities, and partnerships

Finland has extensive public and private-sector data resources and is well placed to make better use of them. The potential for growth and productivity gains is significant. Alongside data utilisation, investment in the production of new data is also needed. Challenges in the use of data are caused by nationally heterogeneous approaches and, for example, EU legislation and its application. However, in Finland, there are good examples of practices that have successfully combined different types of data, thereby strengthening the use of national data resources.

The effective use of data both in RDI activities and in developed products and services will improve Finland's competitiveness and the export and growth opportunities of businesses. Prerequisites for data-based value creation and the creation of new markets include, among other things, the use of artificial intelligence, predictive analytics and software, as well as the human sciences that support their application. Data-based business is scalable, which is why it entails significant growth and export opportunities. In the creative and service industries, the use of data enables the development of new digital business models, customer experience and value chains. Finland can be a major centre of research and innovation in the data economy and artificial intelligence, and can position itself within the EU as a leading data-driven country, but this will require comprehensive development. Data-driven growth can be achieved by ensuring that RDI actors invest adequately in data utilisation and talents, while also strengthening data security, ethical practices and a regulatory environment that encourages research and innovation. This will enable Finland to secure its position as a global leader in the application of technology.

The conditions for producing, accessing, combining and using data are factors that strengthen the competitiveness and attractiveness of the RDI system. The quality of high-performance computing environments and data transfer networks, together with sustainable operating models, are strengths in attracting international experts, companies and RDI investments but also in international RDI cooperation. Data

management infrastructures, data updating and data connectivity, including transfer links, must be ensured in order to make use of data. Data must be findable, accessible, interoperable, reliable and reusable. The continuity of long-term data series, for example in environmental and health themes, must be ensured. It is important to enable the effective use of both public and private data in RDI activities, including by developing the regulatory environment. It is essential to consider the climate and nature impacts of the ICT sector in order to ensure sustainability.

Capabilities

Examples of capabilities:

- EuroHPC LUMI supercomputer, LUMI AI factory and CSC's national environments for data management and high-performance computing (HPC)
- VTT's quantum computers
- Flagships and Centres of Excellence funded by the Research Council of Finland, including the Finnish Center for Artificial Intelligence FCAI and the Finnish Quantum Flagship
- Business Finland-funded leading companies and ecosystems; digital leadership as a strategic theme for Business Finland
- ELLIS Institute Finland for Artificial Intelligence
- Finnish Doctoral Program Network in Artificial Intelligence (AI-DoC)
- FIN-CLARIAH Lighthouse research infrastructure for language technology, artificial intelligence and cultural studies

Finland has strengthened its data-driven RDI activities with significant investments in data utilisation, skills, high-performance computing, data transmission networks, artificial intelligence and quantum technologies. This has supported the construction of key European research environments and infrastructures (e.g. the EuroHPC LUMI supercomputer, the LUMI AI factory and the ELLIS Institute Finland). In this way, Finland has improved its competitiveness in international RDI networks, cutting-edge research, technology development and the commercialisation of new solutions.

Infrastructures for high-performance computing, quantum computing, hybrid computing and artificial intelligence support cross-disciplinary solutions in health and wellbeing, climate and environmental research and industrial digitalisation. At the same time, they strengthen Finland's attractiveness for international talents and investments.

Finnish companies at the forefront will serve as reference cases in attracting international RDI investments while strengthening the global competitiveness of Finland's data economy. Finland's reputation as a stable and open society, as reflected in studies on Finland's country brand, supports the strengthening of data-driven RDI activities.

4.3 Disruptive technologies

Opportunities for growth and renewal:

- Cybersecurity
- Space technologies
- Quantum technologies
- AI
- Semiconductors, including chips
- Biotechnologies and gene technologies
- Technological convergence and interconnection
- The societal impact of technologies

Disruptive technologies are emerging or completely novel technologies that will bring about radical changes in society and the economy. They and their combinations can displace existing technologies, reform prevailing business models and act as drivers of productivity and growth. The impact of disruptive technologies may extend beyond the economy and society to security and international politics.³⁰ Their full impact will often become clear only as development progresses. This makes it important to be able to strategically anticipate and monitor

30 On the concept of disruptive technology see, for example, Holmgren 2024.

the development of disruptive technologies. AI is an example of a disruptive technology whose applications are currently transforming business models, ways of working, people's daily lives, science and innovation.

Successful development and uptake of disruptive technologies will strengthen Finland's competitiveness, strategic autonomy, international partnerships and position in the global RDI landscape. Applications of disruptive technologies also enable breakthroughs and innovations in health and environmental topics. Many technologies and solutions based on them are dual-use, and they can therefore be harnessed in security and defence solutions.

Finland must aim to be a leader in several emerging and disruptive technology areas, while ensuring broad-based expertise and the ability to harness other areas of disruptive technologies. The strategic use of technological progress will strengthen renewal, the attraction of investment and skills, sustainable development, security, and security of supply.

Technological development and the use of technologies also require an understanding and management of the societal changes that they bring about. It is essential to address the issues raised by their use, including privacy, security implications, human and fundamental rights, empowerment, and regulatory and skills needs.

Growth, opportunities, and partnerships

In the coming years, several disruptive technologies and their applications are expected to make breakthroughs and become established in the economy, business and society. This creates significant opportunities for economic growth linked to the emergence of new markets, the adoption of new business models, productivity improvements, positive environmental impacts and the scalability of innovations.

Finland's strengths – such as cybersecurity, space technologies, quantum technologies, artificial intelligence and semiconductors (including chips), as well as biotechnologies and genetic engineering – provide a basis for international growth. By engaging in RDI activities in these areas, Finnish companies can position themselves as frontrunners in and strong users of technology, and can grow their business significantly in the global markets. Disruptive technologies, together with the intangible and data-based value creation which they enable, allow companies to scale and build global competitive advantage. Disruptive technologies can help deliver solutions to global challenges.

RDI cooperation must support the continuous development of expertise in both the private and public sectors in disruptive technologies and their application. The development of disruptive technologies both requires and strengthens international RDI cooperation, which must also pay attention to research on social and societal impacts and to research security and intellectual property rights. At the same time, the emergence of major new dependencies must be prevented to safeguard strategic autonomy. The detailed choices and weights of disruptive technologies must take into account the EU's critical technology areas, the emerging and disruptive technologies identified at NATO, and the pursuit of Finland's unique expertise and competitive advantage.

The convergence and interconnection of technologies is driving innovation and creating new growth opportunities, also for Finland. Supporting this development requires multidisciplinary and cross-sectoral research, as well as deep forms of interdisciplinary research, technological development and innovation.³¹

The development and deployment of disruptive technologies in society require a broad knowledge base in science, mathematics and engineering, a high-quality, broad-based education, a strong link between disruptive technologies and their practical applications, a solid industrial and business base, and research and technology infrastructures at international level.³²

31 See, for example, OECD (2025b) and Rodríguez (2025).

32 See, for example, the Research Council of Finland website <https://www.aka.fi/en/research-funding/funding-opportunities2/programmes-and-other-funding-schemes/research-infrastructures/>.

Capabilities

Examples of capabilities:

- EuroHPC LUMI supercomputer and the LUMI AI Factory
- VTT's RDI infrastructure for quantum technologies
- Combinations of the previous two in hybrid computing
- Several flagships and Centres of Excellence funded by the Research Council of Finland, including the Finnish Center for Artificial Intelligence (FCAI) Flagship, the Finnish Quantum Flagship, the 6G Flagship and the Photonics Research and Innovation Flagship
- Numerous Business Finland-funded leading companies and ecosystems; Business Finland's strategic themes include disruptive technologies
- OtaNano research infrastructure for micro, nano and quantum technologies, the Future Wireless Research Infrastructure (FUWIRI) and Biocenter Finland's Lighthouse research infrastructures.

Finland has internationally high-quality research and expertise, research and technology infrastructures and business activity in a number of emerging and disruptive technologies. The strengths of disruptive technologies and of their application need to be identified and developed systematically to ensure the desired knowledge base, economic growth and societal impact.

4.4 Health and wellbeing

Opportunities for growth and renewal:

- Promoting health and wellbeing
- Digital services, such as health and wellbeing apps and telecare
- Health and wellbeing data and services
- Clinical research and pharmaceutical research and development

Finland must make the promotion of health and wellbeing, and the related proactive and preventive healthcare and social welfare, a source of social renewal, productivity, economic growth and fiscal sustainability. RDI activities can generate knowledge to support health and wellbeing, strengthen business and growth opportunities for health and wellbeing companies, and curb the rising costs of public services. This requires bold renewal of operations by making use of research data, innovation, artificial intelligence and the data economy.

A transition to preventive and data-driven healthcare 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 ethical standards.

Growth, opportunities, and partnerships

Demographic changes, ageing, growing social inequality, changes in lifestyles and changes in the surrounding world change health and wellbeing in Finland and globally. For example, the ageing population and the growing share of specialised medical care are putting a strain on the entire healthcare and social services system. The health and welfare sector is growing rapidly worldwide, creating global export and growth opportunities for businesses. The digitalisation of healthcare systems, the data economy and individual treatments are being developed rapidly.

Finland is well positioned to establish itself as a global leader in the utilisation of genomic data, disease prevention, combined health data and AI-based treatment solutions in both society and business. In the West, the age structure of societies is forcing them to look for solutions in digital health-supporting tools, for which there is a large and proven market. Finland's image as a producer of wellbeing-enhancing social innovations is a good basis for new exports.

Wellbeing services counties, municipalities and public services, together with businesses, universities and research institutes, can act as platforms for RDI activities. This can boost the research, development, deployment and scaling up of Finnish health and social services and solutions, such as wellbeing apps, telecare and diagnostics. At the same time, the health and wellbeing of populations can be promoted widely even at a global level. Health and wellbeing can be promoted, for example, through physical activity, culture, nutrition, nature and by preventing inequalities, and RDI activities provide new knowledge, skills and effective solutions for these.

The efficient and sustainable use of resources in healthcare and social welfare requires more efficient service systems, a wider use of digital solutions and artificial intelligence, and multidisciplinary RDI activities. At the same time, it is necessary to ensure the participation of wellbeing services counties, municipalities and the third sector in RDI cooperation and that regulation enables effective RDI activities in the health and wellbeing sector.

Health and wellbeing companies need domestic development partners and innovation ecosystems. It is important for Finland's competitiveness and export growth that health and wellbeing solutions are commercialised and scaled up as comprehensively as possible, already at home.

Capabilities

Examples of capabilities:

- Several flagships and Centres of Excellence funded by the Research Council of Finland, including flagships in cancer research (iCAN), gene, cell and nanotherapy (GeneCellNano), immune system research (InFLAMES) and inequality, interventions and welfare society research (INVEST).
- Biocentre Finland and the Euro-BioImaging lighthouse research infrastructures for imaging technologies
- Business Finland-funded leading companies and ecosystems; health technologies as a strategic theme for Business Finland
- FinnGen's research combining genetic and health information, with researchers and the pharmaceutical industry working together.

Finland has a strong competence base in medicine and other life sciences, health technologies, clinical research, pharmaceutical research and development, and research on wellbeing, nutrition and planetary health. Scientific research supports both prevention and treatment. Biobanks, big health data and high-performance computing provide a unique platform for developing new therapies and business models.

Also of national importance are shared research and technology infrastructures and research, testing and piloting environments with multidisciplinary and cross-sectoral expertise. Finland's various health-related registers are among the best

in the world and internationally attractive for both research and business. Finnish health data and related expertise can be transformed into a world-class research and innovation ecosystem that attracts knowledge, investment and growth.

4.5 Climate, environment and the Arctic dimension

Opportunities for growth and renewal:

- Dismantling the fossil economy
- Energy transition and a sustainable energy system
- Clean and digital transition
- Climate and nature solutions
- Circular economy
- New material solutions
- Bioeconomy
- Sustainable food production and system
- The Arctic dimension and the Arctic environment

The triple crisis caused by global climate change, biodiversity loss and pollution, and the sustainability transition required to address it, create for Finland not only a need for societal renewal and adaptation and but also an opportunity for competitiveness, exports and growth. Opportunities for renewal and growth stem from the phasing out of fossil fuels, the energy transition, the clean and digital transitions, climate and nature solutions, the circular economy, new material solutions, the sustainable bioeconomy, food production and the food system. Many of these areas can also support health and wellbeing, strategic autonomy, security of supply and resilience.

Many climate and environmental challenges are highlighted in the Arctic. Finnish Arctic research and expertise in the atmosphere, marine environment and space provide a strong basis for international RDI partnerships and strategic cooperation in the rapidly evolving Arctic region, with its importance underlined by the current geopolitical context. The Arctic dimension involves societal aspects ranging from security policy to the region's livelihoods, its inhabitants and the status of indigenous peoples. Certain economic sectors including mining, wind power and tourism are growing rapidly in the Arctic.

Growth, opportunities, and partnerships

Based on its strengths, Finland has the potential to be a solution provider at a global and European level. To support a system-level sustainability transition and harness the competitiveness and growth potential of enterprises, we need research-based knowledge and innovation, RDI investment and skills, and RDI cooperation between industry, other societal actors and research organisations. Companies' new business models and value chains, intangible and data-based value creation and services are essential for the sustainability transition and sustainable economic growth. A decoupling from the fossil economy allows new industrial ecosystems to emerge. Finland has a potential raw material base for high value-added bio-based innovations. Europe also faces a strong need to accelerate innovation in the energy sector. Research and development of technologies and business models that support the energy transition are therefore essential for national competitiveness. A market for carbon sinks is emerging in Europe, and a market for total climate impact is also expected to emerge within five to ten years. Similarly, the market for natural assets will be developed in Europe in the next few years. Finland has expertise and significant potential in the creation and related verification of these markets.

RDI activities related to societal and economic impacts and solutions also contribute to the sustainability transition. For example, citizen and consumer behaviour, incentives, regulation and ensuring the fairness and equity of the transition play an important role.

Long-term quantitative and qualitative monitoring data on the climate, atmosphere, environment, nature, and the built environment are also needed, including those produced by research and technology infrastructures. The use of new technologies to monitor the state of the environment is a Finnish strength, creating opportunities to further develop monitoring and generate business activity.

The Arctic environmental, atmospheric, marine and space expertise offers international opportunities for growth and cooperation in a highly competitive environment.

Capabilities

Examples of capabilities:

- Several flagships and centres of excellence funded by the Research Council of Finland, including flagships in the fields of materials bioeconomy (FinnCERES), atmosphere and climate (ACCC) and forest-human-machine interplay (UNITE).
- Business Finland-funded leading companies and ecosystems, Business Finland's strategic themes include energy systems and technologies, the maritime industry and Arctic expertise, food technology and biomaterials
- INAR RI ground-based research infrastructure for atmospheric sciences and numerous international research infrastructures such as the European Incoherent Scatter Scientific Association (EISCAT), the Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS ERIC) and the Integrated Carbon Observation System (ICoS ERIC).
- VTT Bioruukki piloting centre and innovation platform for biobased products

Finland has internationally high-level research and expertise, significant research and technology infrastructures and competitive business activity in climate and nature solutions, the clean and digital transitions, the circular economy, the bioeconomy and the water sector. On the basis of international comparisons, Finland has extensive information resources related to nature and natural resources. In addition, Finland has expertise, partnerships and new opportunities for cooperation on themes and technologies related to environmental monitoring, the Arctic environment, the atmosphere, oceans and space. A strong image as a responsible country that emphasises sustainability and nature values, and as a leader in clean energy and sustainable technology, will create a basis for new RDI investment, growth and attracting international talents.

4.6 Security, resilience and defence

Opportunities for growth and renewal:

- Comprehensive security
- Finland's comprehensive security approach
- Defence industry
- Dual use

Accelerating changes in the global operational and security landscape and the accumulation of risks from human activities, technological developments and nature necessitate the strengthening of the resilience of society and industry. Geopolitical tensions, the threat of war and conflict, rapid technological development, economic and social change, and threats to climate and natural systems are challenging societies, businesses and individuals. Understanding and managing the interdependencies between risks are part of the comprehensive security of society and a prerequisite for long-term sustainable economic growth and prosperity. At the same time, the international security situation, the strengthening of European defence and the NATO membership create significant growth and export opportunities for the defence industry and more broadly for security and defence-related products and services, including dual-use solutions. The Finnish defence industry can play an important role in European defence and in the growth of high skills in the sector.

Resilience is linked to skills, health and wellbeing, the sustainability transition, energy, and food production. To safeguard vital societal functions, resilience and strategic autonomy, risks to critical technologies, health security, raw materials and supply chains must be managed and avoided. Harmful dependencies, particularly on third countries outside the EU, must be reduced. Resilience is supported, for example, by RDI activities that support the sustainable use of Finland's mineral resources and mineral processing.

The stability of the national environment is one of Finland's key strengths. Finland ranks very high in global nation brand surveys with respect to the reliability of the operating environment, the political structure and the systematic nature of governance. Quality governance and institutional stability are among Finland's

strengths. Stability is important for science, technological and innovation development, business and investment and, through these, for the attractiveness of Finland's RDI system.

Growth, opportunities, and partnerships

In a rapidly changing environment, the security of society, the competitiveness of businesses and sustainable growth require innovative skills, a capacity for change and an ability to think creatively and find solutions through unexpected combinations, generated by multidisciplinary and interdisciplinary RDI activities. There is a need for social and societal innovations and holistic solutions that strengthen resilience.

In the current international security landscape, security, defence and dual-use solutions offer growth and export opportunities, partnerships and development needs, including the development of RDI competences in the public and the private sector. Defence spending is increasing globally, while investment in product development is growing and RDI cycles are accelerating. RDI activities can further increase the added value of the defence industry while developing the knowledge and innovation base needed for national defence and strengthening the foundation for the defence industry and technology. For example, many emerging and disruptive technologies are dual-use and critical for security and defence. The EU's defence industrial policy, the forthcoming 10th EU Framework Programme for Research and Technological Development and Finland's NATO membership bring significant added value to supporting industrial RDI activities and cooperation, as well as RDI investments. The European Defence Fund will enable further development of the competitiveness and performance of the Finnish and European defence industry and research community.

Capabilities

Examples of capabilities:

- Competences in defence and dual-use technologies, including testbeds for wireless networking and communication technologies
- Several Business Finland-funded leading companies and ecosystems; defence, cybersecurity, critical raw materials and minerals as part of Business Finland's strategic themes
- Resilience is supported by several flagships and centres of excellence funded by the Research Council of Finland, including the Education for the Future Flagship (EDUCA) and Inequalities, Interventions and New Welfare Research Flagship (INVEST), and the Finnish Centre of Excellence in Space Resilience.

Comprehensive security has been developed in Finland for a long time, and it is based on cooperation between the public and private sectors. People's capacity, skills and mutual trust form the basis of comprehensive security. Finland has internationally high-quality research and RDI cooperation in several areas critical to societal resilience and comprehensive security. In defence and dual-use technologies, the strengths of Finland's RDI system include artificial intelligence, quantum, information and communication technologies, societal preparedness, cybersecurity, space technologies, Arctic marine knowledge, and virtual and augmented reality.

5 Spearheads for developing the RDI system

In addition to the strategic choices, two spearheads have been defined for the development of the RDI system:

- Increasing the risk-taking capacity of RDI activities
- Attracting RDI investments to Finland

While the strategic choices describe what RDI activities should focus on in Finland in particular, the spearheads for developing the RDI system focus primarily on how the development and implementation of choices should be done to ensure effectiveness. The spearheads refine and complement the policy guidelines set out in the multiannual plan for the use of central government research and development funding, and they highlight areas requiring special attention in the implementation of the strategic choices.

5.1 Increasing the risk-taking capacity of RDI activities

New research discoveries and breakthrough innovations in science and RDI involve a great deal of uncertainty. The journey from scientific breakthrough to growth company can take from 10 to 30 years. Breakthrough innovations are important drivers of sustainable growth and essential for social and business renewal and productivity growth. Research and innovation policy in this decade has been about strengthening the long-term RDI policy vision at the national level, in order to provide good conditions for ambitious and risk-taking RDI activities.

RDI activities in Finland have focused on incremental innovations, and riskier radical openings have often taken a back seat.³³ Research and business activities must be able to connect issues and phenomena with an open mind, keep up with global development and markets and identify emerging opportunities. It is therefore especially important to improve the ability of researchers, research organisations

33 See OECD (2017 and 2022).

and companies to take risks in their RDI activities and cooperation. RDI policies and public funding must ensure the facilitation of new research breakthroughs, creative combinations of approaches and sub-combinations, and radical innovations. Innovations typically arise at interfaces and in ecosystems formed by different actors in cooperation. It has already been decided to allocate additional R&D funding to the cooperation between research organisations and companies through Business Finland and the Research Council of Finland.

From researchers' point of view, research funding is very project-oriented, both at European and national level. Uncertainty about the continuity of funding, and therefore of entire careers, makes research careers and risk-taking in research less attractive. This uncertainty also makes it difficult to build long-term business cooperation. Improving the long-term sustainability and predictability of funding must also be accompanied by the capacity to improve the attractiveness and reduce the uncertainty of research careers.

A balance needs to be struck between competitive research funding and core funding in order to create the conditions for risk-taking and new research openings. Core funding for universities and research institutions allows them to take risks when they use it for creative openings and higher-risk R&D activities and collaborations. Alongside increasingly competitive funding, we need adequate resources that universities and research institutions can allocate through their own decisions. With regard to competitive funding, the Research Council of Finland has set itself the objective of improving its ability to support initiatives that are innovative and involve scientific risk. Risk-taking capacity can be supported by improving funding schemes, evaluation practices and communication. For example, Centres of Excellence are encouraged to take risks by means of a large project size and a long funding period.

Increasing firms' risk-taking capacity in R&D is a key prerequisite for the creation of innovations and for the uptake of new technologies. Firms' risk-taking capacity is affected by their perceived uncertainty about the demand for innovations, and about the maturity of technology, market developments and the availability of risk finance. This limits the development and commercialisation of new solutions, even if the foundations were strong. It is important to increase the willingness and ability of firms to take technological and market risks in RDI activities, especially in high-risk but potentially high-return sectors. Significant additional funding has been allocated to Business Finland's funding mandates, to be targeted to companies that are best placed to innovate, take risks, invest in intangible assets and leverage R&D in international business.

From a business perspective, it is important that public funding enables high-risk projects and the use of research and piloting environments. Other means include more risk-tolerant funding models, support for strategic cooperation between research organisations and companies, a sufficient pool of talent capable of ambitious RDI work, enabling the sharing of research and technology infrastructures, and strengthening market demand, for example through innovative public procurement and regulation. Understanding end customers' needs and the resources to prepare for internationalisation and commercialisation is also key to transforming R&D results into competitive new business.

Raising the overall level of R&D funding and other incentives for RDI activities allows for greater diversity in research and innovation. Risk-taking is best supported by adequate long-term resources, so that an increasing number of high-quality and ambitious RDI projects are carried out. R&D and innovation funding activities should continue to be developed in a way that serves the risk-taking capacity of researchers, research organisations and companies. In addition to RDI policy and public funding, it is important to ensure that companies, higher education institutions and research organisations have a management and operating culture that boost risk-taking capacity.

5.2 Attracting RDI investments to Finland

In Finland, R&D expenditure by large companies accounts for the largest share of private sector R&D expenditure. On the positive side, SMEs and start-ups are also willing to increase their R&D investments in Finland.³⁴ In 2021, a total of 57 member companies of the Technology Industries of Finland and Finnish Steel and Metals Producers committed to increasing their own RDI efforts in order to reach the target of four per cent R&D intensity by 2030, provided that the conditions described in the commitment are met. For member companies of the Technology Industries of Finland, this would mean an average annual increase of EUR 200 million in RDI investment every year until 2030, if all companies in the sector were to join in.³⁵

34 Sitra (2024b).

35 Technology Industries of Finland press release, 16 December 2021: <https://teknologiateollisuus.fi/teknologia-teollisuuden-57-jasenyrytysta-sitoutuu-tki-lisayksiin-hallituksen-paatosten-mukaisesti>

Representatives of Pharma Industry Finland have also made a promise of growth for the sector. The industry wants to participate in growth markets and is ready to increase total investment in the pharmaceutical sector to EUR 1 billion by 2030.³⁶

Nevertheless, achieving Finland's R&D target of four per cent solely through domestic companies is challenging. Finland's attractiveness as an RDI investment target must be improved. This applies to both major international companies and companies that already operate in Finland and are considering investments in RDI. An internationally competitive environment is a prerequisite for attracting international talents and companies to Finland. In selected areas, Finland must endeavour to create world-class RDI ecosystems that are internationally competitive in terms of both quality and size.

Competition for RDI investments and talents is global and increasingly fierce. The basis for Finland's attractiveness lies in its image as a stable, reliable and responsible country, and in its knowledge and innovation ecosystems, which combine cutting-edge research, RDI specialists, internationally competitive research and technology environments and infrastructures, and innovative companies. Furthermore, it is essential that Finland be able to provide attractive research, development and testing platforms for those considering RDI investment in Finland.

Finland has to develop its ability to attract RDI investments in areas where it excels and has a strong competence base. Attracting investments must particularly support initiatives in the areas of the strategic choices in national RDI policy and activities and strengthen Finnish competence. The focus is on building strong, long-term partnerships at country, business and research organisation levels. To achieve this, national cooperation must be stepped up to strengthen international RDI investment. Attracting investments requires closer cooperation between existing actors.

Particular attention should be paid to the active, coordinated attraction to Finland of RDI activities of large, internationally strong companies, and to the concentration of RDI activities in Finland by globally active Finnish companies. There is a need to increase shared understanding of RDI country brand work and existing strengths. Partnership support and country branding are built on internationally high-quality research, highly qualified RDI specialists, innovative companies and public-private RDI cooperation.

36 Pharma Industry Finland press release 21 March 2025, [https://www.laaketeollisuus.fi/uutishuone/uutiset/laaketeollisuus-luovutti-hallitukselle-arvolupauksen-miljarditason-investoinnit-vuoteen-2030-mennessa.html](https://www.laaketeollisuus.fi/ uutishuone/uutiset/laaketeollisuus-luovutti-hallitukselle-arvolupauksen-miljarditason-investoinnit-vuoteen-2030-mennessa.html)

Finland's competitiveness in the global competition for RDI investment also depends on other factors, such as the openness of society to international talent, freedom of research, the attractiveness of the working and living environment, taxation and the competitiveness of remuneration. The whole system must be attractive and functional in order for both investments and talents to stay in Finland. This will require more coordinated measures than previously.

6 Implementation and monitoring

The promotion of RDI is the responsibility of all branches and levels of government, as well as other public actors. At the national level, policy guidelines related to RDI policy are currently being prepared not only by the Ministry of Education and Culture and the Ministry of Employment and the Economy, but also by other ministries within their respective remits. The geopolitical situation and global challenges require the governance of the RDI system to develop shared cross-sectoral views on the expertise and capabilities needed in society. Building on parliamentary work, the Government has reformed the tasks and the role of the Research and Innovation Council. While efforts have been made to strengthen the inter-ministerial coordination of RDI policy, Finland still needs a more determined leadership and coordination of research and innovation policy to enable the overall development of the RDI system.

In implementation, the strategic choices will be deepened and made more concrete in cooperation between the various actors, taking into account human capital, growth and productivity aspects. The quality of implementation will determine what kind of growth and impact the choices will yield. The Research and Innovation Council monitors the implementation of the choices and is supported by the council secretariat, including through open stakeholder meetings where appropriate. The Council regularly discusses the progress made in implementing the strategic choices.

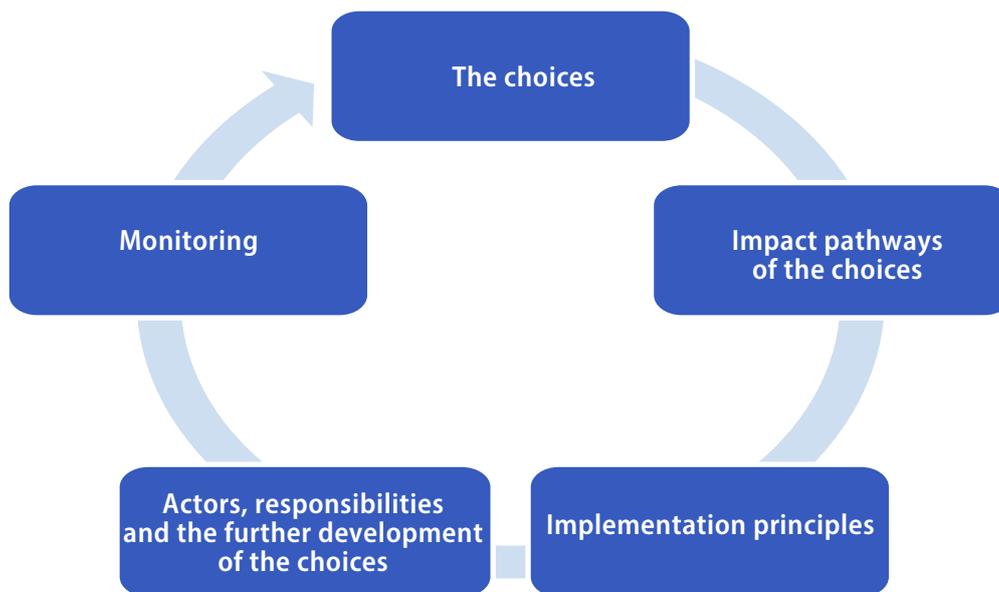
The effects of national choices are mainly felt over the long term. Long-term RDI policy is important for investors, companies engaged in RDI, research organisations and researchers alike. For this reason, implementation of the choices will begin during the current government term and will continue into subsequent terms. Each government will have an opportunity to deepen the broad choices as part of an updated multiannual plan for the use of government R&D funding.

The choices are of differing types, so implementation will also vary depending on the choice. In nearly all the areas covered by the choices, there are inter-ministerial groups, cooperation arrangements, funding packages, strategies and other national guidance documents. The basis for the implementation is therefore to make full use of the existing structures and ongoing work. In particular, the funding and

programmes of the Research Council of Finland and Business Finland and their close cooperation are key to implementation. Further work will also explore the potential of private research funding, including foundations, to strengthen the areas covered by the choices.

Implementation and monitoring are structured into the following areas: 1) the impact pathways of the strategic choices, 2) the implementation principles, 3) the actors, responsibilities and further development of the strategic choices, and 4) monitoring (Figure 2).

Figure 2. Implementation and monitoring areas



1. Impact pathways of the choices

The national strategic choices have an impact through three broader pathways: directing resources to the choices; increasing national cooperation between RDI actors and branches of government; and strengthening international cooperation and influence.

Pooling resources for the choices includes not only directing existing R&D resources but also, where separately decided, allocating additional government R&D funding to strengthen internationally competitive research and competence clusters and ecosystems. Concentrating resources in selected areas will improve productivity, build competitive advantage and critical mass, and meet global demand.

Strengthening national cooperation will improve the conditions for developing and deploying innovations. Within the areas covered by the strategic choices, the EU-level and international cooperation can be strengthened, thereby supporting the attraction of EU funding. The choices will strengthen Finland's EU advocacy work and will also provide broader opportunities to communicate more clearly in international fora about Finland's national strengths and its commitment to strengthening skills and resources. The choices will strengthen country branding at different levels of the system, and can be used systematically to attract investment and talent.

2. Implementation principles

A key rationale for implementation is that the strategic choices will strengthen cooperation and growth while addressing skills and productivity considerations. In implementation, the choices and their objectives will be deepened and made more concrete and actions and resources will be brought together to deliver them.

The implementation of the strategic choices is based on making use of existing structures and cooperation. Public R&D funding will be directed to areas covered by the choices. The choices support the work of the ministries, creating the conditions for stronger cooperation and growth. Ministries are actively developing an enabling environment, using a range of policy instruments, including looking at potential barriers.

Implementation will take into account the different time horizons of RDI activities, and will strengthen high-quality science and expertise over the long term and innovation, investment and growth over the shorter term.

3. Actors, responsibilities and further development of the choices

The strategic choices will support decision-making at different levels of the RDI system; the choices made by research organisations and regions; areas of cooperation; and the pooling of resources. The choices allow for different

approaches and encourage new openings and cooperation. New phenomena and new ways of looking at things may also emerge between the choices and at their interfaces.

In the area of most of the choices, decision-making authority is divided between several ministries, and the ministries will agree, within their remits, on the implementation responsibilities and the available resources. The Research Council of Finland and Business Finland will implement the choices in their activities and in a deepening cooperation, and their existing priorities and strategies support implementation. In addition, the choices also provide a basis for different RDI actors to orient their own RDI activities and cooperation. Implementing these choices requires broad national cooperation. The Research and Innovation Council will coordinate and, where necessary, align the implementation of the choices as part of its duties.

The Finnish Government and the ministries have a wide range of policy instruments at their disposal to implement the choices. Funding allocations linked to the choices can be made in the preparation of the General Government Fiscal Plan and the budget proposal. Other instruments available to the ministries include legislation and guidance of the actors operating in the respective branch of government, especially the Research Council of Finland, Business Finland, higher education institutions and research organisations. Improving the operating environment, for example through regulation and public procurement, is an important way to create an enabling environment and increase the demand for innovation.

Inter-ministerial cooperation and coordination is essential in the areas covered by the choices. It can build on the existing cooperation structures already in place in the areas covered by the choices, as well as the Government's RDI policy network and, where appropriate, it can set up cooperation and preparation groups. The Research and Innovation Council will monitor the launch of implementation and will make proposals for further action if necessary.

Business Finland and the Research Council of Finland will implement the choices by targeting funding calls, directing programme activities and actively cooperating and developing approaches, including joint and parallel programmes.

Companies, higher education institutions, research organisations and other RDI actors are essential for the implementation of the choices. The implementation methods include the strategic orientation of activities, the strengthening of cooperation, and partnerships.

The Research and Innovation Council will support the implementation of the choices and their use in country branding by producing common communications material.

4. Monitoring

The Research and Innovation Council will monitor the implementation of the choices. The monitoring and evaluation of the strategic choices will be integrated as part of the implementation of the monitoring and assessment plan for the use and impact of government R&D funding adopted by the Council in June 2025. The monitoring of the implementation of the choices will use data that is already being collected in different parts of the system.

As part of the implementation of the choices, the Council Secretariat may organise stakeholder meetings or consultations to support and concretise the monitoring efforts. The implementation will monitor comprehensively the overall impact of the choices on society. The areas to be monitored may include:

- development of RDI cooperation in the areas covered by the choices
- allocation of R&D funding
- Business Finland's and the Research Council of Finland's actions, strategic priorities and programmes
- the strengthening of existing competence clusters and innovation ecosystems and the emergence of new ones
- the development of R&D investment by domestic and foreign businesses, especially SMEs and growth companies
- international RDI investment and funding
- the number of high-skilled and R&D jobs, the level of education of R&D workers, numbers of degrees in the areas covered by the choices
- the number and development, export and productivity of enterprises created in the areas covered by the choices
- investment in R&D-based companies of Finnish origin
- country branding and export actions in the areas covered by the choices.

7 Preparation of the choices

7.1 Assignment to the Research and Innovation Council

Parliamentary guidelines

In its final report, the Parliamentary RDI Working Group 2022, which operated during the previous parliamentary term, set out the need to identify national R&D priorities and make strategic choices.³⁷ According to the working group's position, the choices and the preparation leading to them will be carried out under the leadership of the Research and Innovation Council, openly and involving all RDI actors in a joint discussion. The process must identify global trends, the requirements of the green transition, the conditions for and constraints on growth, and define strategic choices and research and innovation policy development needs such that RDI policy can be steered in a manner that promotes the green transition. The working group required that the choice of priorities be based on research evidence and a systematic and extensive knowledge base, updated as necessary. The report stressed the importance of committing to the choices.

In its final report, the Parliamentary RDI Working Group 2022 confirmed the commitment to the principles for the development of the RDI system, set out in earlier parliamentary work. The principles for the development of the RDI system also apply to the strategic choices. The principles relevant to the choices and their implementation are cooperation, competitiveness, impact, the recognition of global challenges, and technology and industry neutrality. Technology and industry neutrality means that the public RDI system does not "select winning firms, technologies or industries at the level of detail". According to the parliamentary guidelines, "when allocating support, existing strengths and society's strategic objectives may nevertheless be taken into account".

37 Parliamentary RDI Working Group 2022 (2023)

Multiannual plan for the use of government R&D funding

In June 2024, the Finnish Government approved a multiannual plan for the use of government research and development funding. In line with earlier parliamentary work, the plan stated that Finland's future success will be built through strategic R&D choices. Global and national societal challenges and the opportunities they create for R&D actors are identified in R&D activities and their targeting, taking into account Finland's strengths. Choices will be identified under the guidance of the Research and Innovation Council in a participatory and open process. Selection criteria are to be defined as a basis for identifying the strategic choices. The choices must be based on research knowledge and an up-to-date, updated knowledge base collected systematically and extensively. It is important to ensure the commitment of business and other actors to the choices.³⁸

7.2 Preparation process

Preparation of the choices began with an open stakeholder seminar on 8 November 2024, followed by a stakeholder survey from 18 November to 3 December 2024. The draft strategic choices were circulated for comment from 26 February to 10 March 2025, with an open stakeholder event held on 28 February 2025. During the preparation process, the different actors in the RDI system also organised their own debates on the choices. The Secretariat made every effort to be available to stakeholders, and presented and discussed the choices at a number of different events.

The Research and Innovation Council and its preparatory composition discussed the strategic choices process and the choices at their meetings from October 2024 to November 2025. In the early stages of preparation, for the Council meeting on 16 December 2024, the Research Council of Finland and Business Finland were invited to summarise their existing funding priorities, the choices they have made and the current and emerging strengths of Finnish R&D activities.

The basis for identifying the strategic choices consisted of the four aspects presented in Section 3.2: productivity, growth and renewal; national and global challenges; international partnerships; and expertise and capabilities.

38 Finnish Government (2024a).

The choices were also discussed by the Finnish Government's RDI policy network and the permanent secretaries' meeting. During the preparatory process, the Secretariat also discussed the choices separately with the ministries that are key to implementation. From March to May 2025, the choices were subject to political consideration, following which further preparation was requested to pay particular attention to the implementation model of the choices, to deepening and concretising the choices during implementation in cooperation between the various actors, and to skills, growth and productivity perspectives in implementation.

The Parliamentary RDI monitoring group discussed the strategic choices process at its meeting on 3 December 2024. Furthermore, the choices were discussed at a joint meeting of the Research and Innovation Council and the monitoring group on 6 March 2025.

The preparation process used information produced by the Finnish Innovation Fund Sitra and its partners, for example, on the RDI systems of other countries and the strategic choices they have made. To support the identification of choices, a foresight workshop was organised in February 2025 in cooperation with Sitra by the Government RDI Policy Network.

The key meeting documents of the preparatory process are available on the websites of the Research and Innovation Council³⁹ and Parliamentary Working Group on Research, Development and Innovation⁴⁰. In addition, during the preparation of the choices, information on the progress of the process was published on the Government's website.

7.3 Comments received through consultation process

The draft strategic choices were circulated for comment from 26 February to 10 March 2025 in the Government's consultation service at lausuntopalvelu.fi. During the consultation process, comments were requested on the draft choices. Furthermore, views were sought on the preparation, selection and implementation of the draft choices. Finally, there was an opportunity for a free-word comment. A total of 139 comments were received. The Secretariat's summary of the opinions has been published on the [Research and Innovation Council's website](#).

39 <https://valtioneuvosto.fi/hanke?tunnus=VNK032:00/2023>

40 <https://valtioneuvosto.fi/hanke?tunnus=VNK010:00/2024>

The draft choices circulated for comment consisted of three cross-cutting and three thematic draft choices. The cross-cutting draft choices were: 1) *increasing RDI risk-taking capacity and attracting investment*, 2) *data and data-based value creation* and 3) *resilience*. The thematic draft choices were: 1) *disruptive technologies, dual use and defence*, 2) *health and wellbeing* and 3) *climate, environment and the Arctic dimension*.

In the continued drafting after the consultation round, the basic principles of the strategic choices remained unchanged. The choices and their descriptions were refined, complemented and restructured. Disruptive technologies were included as a separate choice. Defence, which was linked to disruptive technologies in the draft choices, together with resilience, made up a new broader choice, *Security, resilience and defence*. The RDI system choices were further elaborated into spearheads for developing the RDI system. In addition, the further preparation process focused attention on the implementation of the choices, among other things.

8 RDI choices of other countries

This chapter contains a snapshot of RDI choices of Finland's key comparator countries and of the key innovation leaders on a global scale. For a fresh overview of how R&D spending is evolving in different countries and of the global situation in RDI competition, see the Research and Innovation Council's monitoring report on R&D funding, to be published this winter.

The information in this chapter is based on a study⁴¹ commissioned by Sitra about the strategic targeting of public RDI investments in Denmark, Norway, Sweden and the Netherlands, on Sitra reports on innovation systems in Ireland and Japan, and on Team Finland Knowledge experts' reports on their target countries. The situations in different countries are changing rapidly, and it is known that some countries are currently updating their choices.

The Netherlands

RDI policy in the Netherlands is divided between the government branches of the Ministry of Education, Culture and Science and the Ministry of Economic Affairs. Two ministries guide the activities, but the coordination and implementation of RDI activities is centralised in the Dutch Research Council (NWO) operating under the ministry of science. The Dutch Research Council directs the allocation of research funding to science and research through the Dutch Research Agenda (NWA) and to innovation through the Knowledge and Innovation Covenant (KIC). The NWA covers the years 2023–2026 and the KIC the years 2024–2027. The performance and effectiveness of the two parallel channels are actively monitored.

In addition, top sector clusters (*Topsectoren*) are alliances of representatives of certain economic sectors that are central to the Dutch economy, which support cooperation and are looser than formal alliances or consortia. In these alliances,

41 Sitra (2024c). Julkisten TKI-investointien strateginen kohdentaminen – Verrokkianalyysissä Alankomaat, Norja, Ruotsi ja Tanska (Strategic allocation of public RDI investment – Comparative analysis of the Netherlands, Norway, Sweden and Denmark). Writers: Matleena Moisio, Suvi Peltoniemi, Kirsi Pulkkinen, Susanna Sepponen, Gaia Consulting Oy.

businesses, the scientific community and central government cooperate to promote innovation. The top sectors operate numerous cross-sectoral knowledge-industry ecosystems that can form consortia to carry out, for example, project or programme activities. This aims to mobilise funding from private sector sources and the international arena, alongside public investment.

Both the NWA and the KIC are linked to serve the Dutch RDI missions, which were established in 2020. The missions are time-bound objectives defined at the highest level, which aim to find solutions to the most pressing problems facing society. These cross-cutting themes, selected in partnership between government and top sectors, are linked to complex societal and competitiveness challenges, and seek innovation through collaboration between science and industry to address them. Mission orientation has been introduced alongside established practices. The missions are top-level social objectives and do not have a clear steering influence on the selection of strategic choices.

Strategic priorities for RDI in the Netherlands:

1. Climate and energy: The Netherlands to be climate neutral by 2050
2. Circular economy: Fully circular society and economy in the Netherlands by 2050
3. Agriculture, water and food: Rural vitality, natural carrying capacity and climate resilience in the Netherlands
4. Health and care: Dutch people live five years longer in good health and health inequalities between socio-economic groups fall by 30 per cent by 2040
5. Security: The Netherlands is safe and secure and the problems of external threats and crime have been mitigated, both in the physical environment and in the digital world.⁴²

In the context of the changing geopolitical situation, the Netherlands has embarked on a determined search for bilateral partnerships in international cooperation, particularly in areas where it has expertise. One of these is chip technology, where the Netherlands wants to cooperate only with other leading countries.⁴³

42 Sitra (2024c, 20), original source RVo 2024: Missiegedreven innovatie en topsectoren.

43 Visit of the Secretariat of the Research and Innovation Council to the Dutch Ministry of Education, December 2024.

Sweden

Since the early 1980s, the selection process for RDI priorities in Sweden has taken place through the government's research policy (*forskningspropositionen*). This policy defines the main lines of research and innovation, setting the overall framework for research, innovation and higher education policy over a four-year period. The latest policy was completed in report form together with draft legislation last winter and was adopted by the Swedish Parliament in May.⁴⁴ The report includes a total of SEK 6.5 billion for free and high-quality research and innovation. Key investments will focus on frontier research, university funding, research careers, research infrastructure such as biobanks, databases and artificial intelligence, future technologies such as artificial intelligence and strategic technology areas, and applied research to improve the quality of public services including schools, social services and healthcare. Sweden is also seeking to increase its participation in EU research programmes.⁴⁵

Denmark

Denmark published its national strategic RDI choices for 2026–2029 at the end of October 2025. In the past, Denmark made choices over a shorter time horizon than other countries, with innovation being guided by numerous sectoral strategies and several ministries.⁴⁶ In addition, research activities are influenced by strong foundation-based funding.

However, the Danish government has decided to implement a historic reform of Danish research and innovation policy. Under the new proposal, the government will allocate multiannual budgets to selected areas so that research can be more rigorously targeted at developing new solutions to the most pressing problems. The multiannual investment of over DKK 19 billion in research and innovation is a significant boost to the R&D sector. In euros, this is about EUR 2.5 billion over four years. It is noteworthy that one of the areas of investment is free bottom-up research.

The selected priorities are security, critical technologies and defence research (DKK 6.9 billion), the green transition (DKK 6 billion), health and life science (DKK 3 billion) and free bottom-up research and innovation (DKK 3.8 billion).

44 Regerings kansliet (2024 and 2025).

45 Regerings kansliet (2025).

46 Sitra (2024c).

Funding comes from the research reserve and the government's 2026 draft budget, which is part of the public research budget. The priorities will be negotiated with the parliamentary parties, according to a government press release.⁴⁷

Norway

For decades, Norwegian research policy has been guided by a science policy strategy updated every few years, also known as the 'research white paper' (*Forskningmeldingen*), which is presented to the Storting, the Norwegian parliament, by the Ministry of Education and Science. In 2012, the strategy was revised into a long-term plan for research and higher education, setting out the strategic priorities for research for the next ten years. The Norwegian government updates the long-term plan in a process that takes place every four years. The current long-term plan for 2023–2032, now in its third iteration, is more mission-driven. The objectives are grouped under four headings: strengthening competitiveness and innovation capacity; promoting economically, environmentally and socially sustainable development; strengthening high quality research; and promoting access to research and education. Mission-driven RDI policy aims to address broad societal challenges through thematic, cross-sectoral approaches. However, the implementation of the mission-driven approach is challenged by Norway's strong sectoral policy, which is reflected in the fact that a significant part of RDI funding is channelled through sectoral ministries.⁴⁸

Ireland

Ireland's Research and Innovation Strategy (Impact 2030) has two main objectives. On the one hand, the aim is to improve the international competitiveness of leading sectors and, on the other, to disseminate high technology and new forms of expertise and operating models as widely as possible across different sectors, companies and regions.⁴⁹

Ireland aims to be a global leader in the digital and green transition and in new disruptive technologies such as cybersecurity, artificial intelligence, and quantum computing.⁵⁰

47 Uddannelses- og Forskningsministeriet (2025).

48 Sitra (2024c).

49 49 Hämäläinen (2024).

50 NCPC (2023).

The strategy is supported by a merger of the Irish Research Council, which funds the humanities and social sciences, and Science Foundation Ireland, which funds research in science, technology, engineering and mathematics. The objective of merging these funding bodies is to achieve greater interdisciplinarity in research. This institutional reform is complemented by improved cooperation between all ministries and the public research system. At the same time, a new public administration unit and scientific advice structures will be created to support knowledge-based decision-making. The evaluation of the impact of R&D activities plays an important role in this.⁵¹

The United Kingdom

The United Kingdom's recent Industrial Strategy, a long-term ten-year roadmap, is currently the most clearly guiding instrument for national choices. The strategy aims to boost business investment and develop eight key strategic growth sectors: manufacturing, clean energy, creative industries, technology, finance, life sciences, defence and business services. The strategy identifies high energy costs, regulation, access to finance, skills shortages and infrastructure as challenges for industry. The government has a role as an active partner in ensuring growth-friendly interventions and a stable environment, and R&D funding will also be channelled to growth sectors in the coming years.

The Industrial Strategy provides an overall framework, supported by sectoral plans developed for each of the eight sectors. The strategy is monitored by the Independent Industrial Strategy Advisory Council (ISAC), which reports and monitors indicators.

The basis for these priorities was already laid during the previous government, for example in the Integrated Review Refresh 2023, the UK's foreign, security, defence and development policy report. According to it, the United Kingdom aims to become a science and technology superpower and to strengthen national resilience by investing particularly in its strengths, including research and development in innovation, artificial intelligence and cybersecurity. The UK Science and Technology Framework, which brings together science and technology, identified priority areas such as artificial intelligence, semiconductors, quantum technologies, future communications and biotechnology.⁵²

51 Department of Further and Higher Education, Research, Innovation and Science (2022).

52 Ministry for Foreign Affairs' expert reporting (2025).

The United States

RDI policy as a source of strategic competitive advantage and, conversely, federal research funding as an element of conservative domestic policy have risen high on the political agenda under President Trump. The White House states that it will prioritise critical and emerging technologies, including artificial intelligence, quantum technologies, semiconductors and microelectronics, 6G, other future information technologies and advanced manufacturing. Energy is also a priority area, including fossil energy, nuclear fission and fusion, the nuclear fuel cycle, critical minerals and processing and energy storage. The administration will also prioritise the Arctic region and research into its physical, biological, geological and socio-economic processes and interaction systems. Space priorities include civil and defence missions, the Moon and Mars, long-duration missions and habitation, space construction and space weather risks. Other priorities mentioned include oceans, defence and preparedness, health, biosecurity and biomanufacturing.

The White House priorities align in several respects with Finland's capabilities. Finland has invested in infrastructure such as high-performance computing, quantum computing and artificial intelligence, which supports innovation in industrial digitalisation and, for example, in the health and wellbeing sector. There are also similarities between the stated priorities and Finland's strategic choices in other respects. A notable difference is the US emphasis on fossil energy and the absence of climate change and the green transition in the White House list.⁵³

Japan

Japan's innovation policy is guided by long-term strategic foresight, with the Council for Science, Technology and Innovation (CSTI) in the Prime Minister's Office playing a central role. The CSTI ensures that national innovation policy and technological development priorities align with the country's economic and social objectives. The long-term vision is seamlessly integrated into the national political agenda and is supported across successive government terms. In Japan, innovation policy priorities are set in partnership between ministries, business and academia. The CSTI plays a key role in policy coordination. In addition to technological and societal choices, the focus is on international cooperation, skills development, strengthening resilience and a policy process based on continuous learning.

53 Ministry for Foreign Affairs' expert reporting (2025).

Japan's innovation policy is designed and implemented on the basis of a long-term vision. The vision often extends ten or even 40 years into the future. Every five years, the CSTI prepares a Science, Technology, and Innovation (STI) Basic Plan. It sets out the strategic priorities for research and innovation, including funding allocations, priority areas for RDI and key policy initiatives. Japan's five-year STI Basic Plan targets strategic choices in selected sectors, such as robotics, artificial intelligence, biotechnology, systemic reform in an ageing society and green energy solutions. These sector choices reflect their potential to support Japan's economic growth and address societal challenges such as population ageing, regional vitality and environmental sustainability. An important part of Japan's long-term innovation policy is to actively participate in international research cooperation and to be part of global innovation networks.⁵⁴

Singapore

In the IMD's 2024 ranking, Singapore was ranked as the most competitive country in the world. The 2023 Global Innovation Index ranked Singapore as the fifth most innovative country, and Finland as the sixth. Owing to determined and strategic investments, Singapore has, in a relatively short period, emerged as a globally significant RDI hub. In scientific citation analysis (top one per cent), Singapore ranks in the same top category as the UK and Switzerland. Singapore's rise is based on a strategic, long-term and integrated approach to RDI governance, with no competition between different levels of government. Singapore's RDI activities are guided by the Research, Innovation and Enterprise Council (RIEC), which is appointed and chaired by the Prime Minister. The RIEC is supported by the National Research Foundation (NRF), which also operates under the Prime Minister's Cabinet. The NRF funds research organisations and programmes. Other key players include the Agency for Science, Technology and Research (A*STAR), which operates and supports RDI activities under the Department of Trade and Industry, and SG Innovate, which funds the development and scaling of deep technologies. The NRF and A*STAR are led by Singapore ministers, representatives of the sovereign wealth fund Temasek and the Economic Development Board (EDB), as well as higher education and business leaders, including from abroad.

The main strategic tool for guiding RDI activities is the five-year Research, Innovation and Enterprise Plan (RIE), which is coordinated by the NRF. The total budget for RIE2025, covering the period until the end of 2025, is around 25 billion Singapore Dollars (SGD, approximately EUR 17.2 billion). RIE2025 focuses on four

54 Turkki (2024).

areas: human health and potential, urban solutions and sustainability, smart nation and digital economy, and manufacturing, trade and connectivity. Within RIE2025, there is a cross-cutting focus on AI: SGD 1 billion was allocated to the five-year National AI Strategy 2.0 for 2024–2029. Singapore was among the first countries to publish an AI strategy back in 2019. In addition, Singapore is investing in quantum technologies; the new quantum strategy will channel SGD 295 million (EUR 200 million) to develop the field and increase the knowledge base over the next five years. According to preliminary information, the RIE2030 plan will launch new interdisciplinary research programmes, such as Flagships and Grand Challenges, focusing on longevity and semiconductors, among others.⁵⁵

55 Ministry for Foreign Affairs' expert reporting (2025).

Appendix: The R&D funding package

Figure 3. Additional funding as part of government R&D funding (EUR million). Source: Parliamentary RDI Working Group 2022 (2023) The graph shows the increase in funding levels as presented in the Working Group's final report. The amendment to the Act on State Financing of Research and Development 2024–2030, which will enter into force from 2026, will change the amounts of additional funding in euros, but not the growth trend.

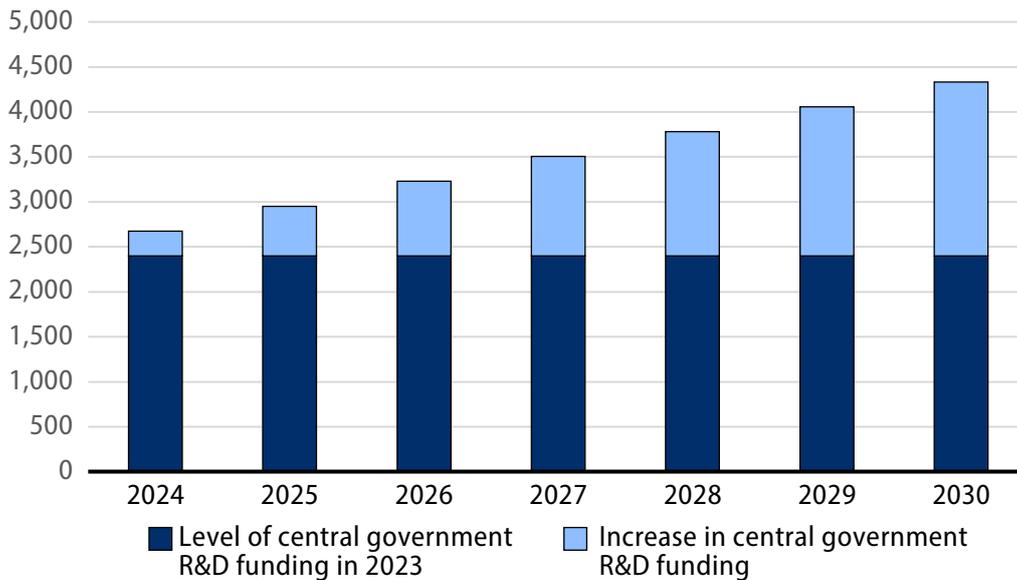
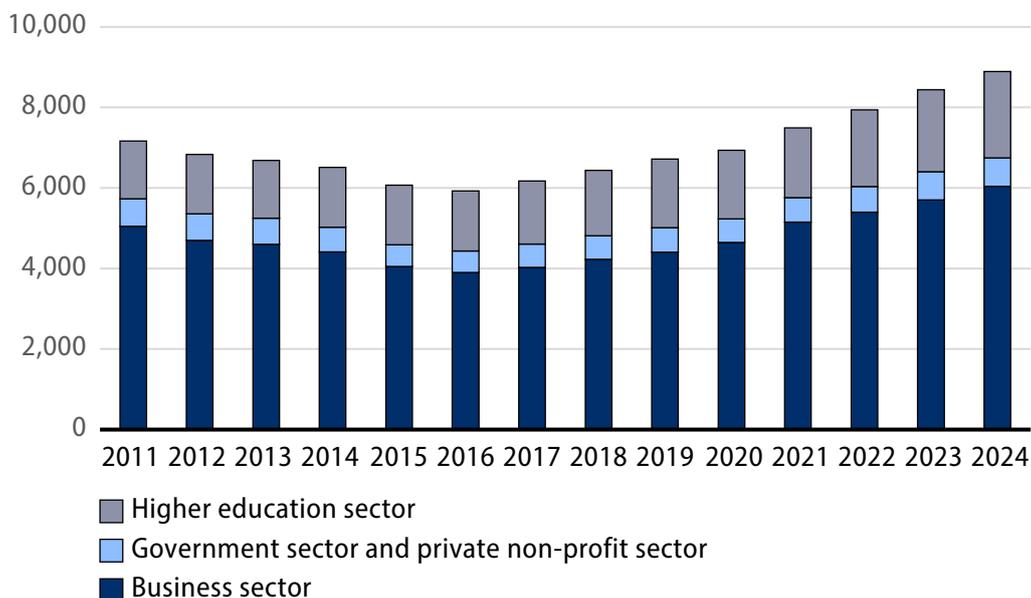


Figure 4. R&D expenditure in Finland by performing sector in 2011–2024 (EUR million). Source: Statistics Finland, Research and Development.



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ISBN pdf: 978-952-383-058-5

ISSN pdf: 2490-0966