

# Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035

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# Annex 1. Supplementary material to the Research and Development, Innovation and Entrepreneurship Strategy

## Global trends

This Strategy takes into account the global development trends affecting Estonia highlighted in Estonia's long-term strategy 'Estonia 2035', complemented by those proposed by experts in the visioning process of the Education Strategy<sup>1</sup>.

**Technology is changing at an ever increasing pace, as are business models and the nature of work.** In order to stay competitive, existing solutions need to be constantly updated and new ones developed. For enterprises, these changes create new business opportunities; however, exploiting them requires the ability (resources, skills) to adopt new technologies, the willingness to continuously learn and adapt business models, the ability to cooperate internationally and to find one's place in changing global value chains. This, in turn, requires keeping up to date with the latest developments in science and technology, both in the field of research and in the education system. The use of data, including data management and cyber security, is becoming increasingly important, offering new business opportunities while also requiring increasingly thorough knowledge and skills. Automated production technologies can lead to changes in the location on global value chains. The ability of people to adapt to new technologies can be a challenge. We need to find new, fast and flexible forms of cooperation between enterprises and research institutions. A small country has to make choices and target policies better ('directionality').

**The scarcity of natural resources is worsening.** It is therefore increasingly important to improve resource efficiency and to develop and deploy new materials and technologies to meet the growing needs of humanity without overburdening the planet. The importance of business models based on the circular economy is growing. Consumption patterns are changing in Western countries, with consumers placing increasing value on environmentally friendly and resource-efficient products, which in turn creates the conditions for innovation.

**The world's population is growing and ageing.** The middle class is growing in Asia, resulting in a noticeable increase in consumption. In Western countries, consumer preferences are changing, with more emphasis on healthy and local products and personalised health services. More attention needs to be paid to increasing the number of healthy life years and maintaining quality of life in old age, which requires the development of health research, services and products.

**International institutions are weakening, the power balance between countries is changing, Asia is getting stronger.** The potential increase in protectionism will significantly change the sales opportunities and competitive conditions for enterprises. Studies of Asian languages and cultures and knowledge of Asian business environments are becoming more important.

**Climate change is continuing and the environment is deteriorating.** International agreements have been reached on climate policy targets, which also puts pressure on Estonian enterprises to change their production models to be more environmentally friendly and to reduce emission production. The causes of climate change and the adaptation processes of the natural environment need to be better understood. More attention must be paid to adapting to the impacts of climate change.

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<sup>1</sup> This subchapter builds on the material prepared in the process of the Estonian Education and Research Strategy 2021-2035 (The vision for competitiveness 04.03.2019) [\[link\]](#)

## Outcomes of the implementation of previous strategies

In the period of 2014-2020, these RDIE policy areas were addressed in the Estonian Entrepreneurship Growth Strategy 2014-2020 (under the responsibility of MoEAC) and the Estonian Research and Development and Innovation Strategy 2014-2020 'Knowledge-based Estonia' (under the responsibility of MoER). The final assessment of the implementation of the strategies will be presented after the end of the strategy period, while an overview of the progress towards the objectives of these strategies was presented in the proposal for the RDIE Strategy<sup>2</sup>. Below, only a summary of the achievement of the target levels of the indicators.

The Estonian Research and Development and Innovation Strategy 2014-2020 'Knowledge-based Estonia'		
Indicator	Target level 2020	Current situation
<b>GENERAL OBJECTIVES</b>		
R&D expenditure, % of GDP	3%	1.61% (2019)
incl. private sector's R&D expenditure, % of GDP	2%	0.86% (2019)
Productivity of enterprises per employee of EU27 average (%)	80%	78.7% (2019)
Ranking in the Innovation Union Scoreboard	10	11 (2020)
<b>Sub-objective 1: Research in Estonia is of high quality and diverse</b>		
Number of doctoral degrees defended per academic year	300	221 (AY 2019/2020)
Percentage of publications among the world's top 10% most cited research publications	11%	8.4% (2020)
Number of high-level articles per million inhabitants	1600	1827 (2019)
<b>Sub-objective 2: Research and development works for the benefit of Estonian society and economy</b>		
Share of public R&D expenditure financed by the private sector	7%	6.9% (2019)
Expenditure on socio-economic applications (excluding academic research) as a share of planned R&D appropriations in the national budget	40%	38% (2019)
<b>Sub-objective 3: R&amp;D makes the structure of economy more knowledge-intensive</b>		
Share of high-tech products and services in exports	15%	11.5% (2018)
Share of employment in high-tech and medium-high-tech sectors of total employment	9%	8.9% (2020)
<b>Sub-objective 4: Estonia is active and visible in international RDI cooperation</b>		
Estonia's success in the EU's R&D framework programme Horizon 2020: volume of contracts per capita, % of EU average	100%	240% (2020)
Share of internationally coordinated research of state-funded R&D	3%	3.02% (2019)

<sup>2</sup> Approved by the Government of the Republic on 12 September 2019. [\[link\]](#)

Estonian Entrepreneurship Growth Strategy 2014-2020		
Indicator	Target level 2020	State of play
<b>GENERAL OBJECTIVES</b>		
Increase productivity per employee compared to the EU average	80%	78.7% (2019)
Increase the employment rate in the 20-64 age group	76%	78.9% (2020)
<b>Sub-objective 1: Estonian people are enterprising and businesses are ambitious</b>		
Number of three year old enterprises with a turnover above EUR 125,000 (three years average).	1600	1568 (2019)
Number of enterprises with 20 or more employees	4000	3714 (2019)
<b>Sub-objective 2: Estonian enterprises efficiently produce high value-added products and offer innovative services</b>		
Private R&D expenditure as a share of GDP	2%	0.68% (2019)
Sales revenue from new or substantially changed products or services (as % of total sales revenue)	18%	13% (2018)
Hourly productivity compared to the EU27 average	65%	65.3% (2019)
<b>Sub-objective 3: Estonian enterprises are active exporters</b>		
Estonia's share in world trade	0.11%	0.096% (2019)
Number of exporters	15,700	16,023 (2020)
Change in the average export price of a product	value growth faster than the EU average	EL average +14.8%, Estonia +3.8% (2020)
<b>Sub-objective 4: enterprises hold Estonia's business environment in high regard</b>		
Estonia's position in the world competitiveness ranking	25	31 (2019)
Estonia's position in the Doing Business index	15	18 (2020)
Access to loans	3.8	4.3 (2019)
<b>Sub-objective 5: Estonian enterprises are competitive in global growth areas</b>		
Number of enterprises involved in innovation cooperation	780	1413 (2018)

## Studies and analyses conducted in the field

The Strategy was prepared on the basis of the assessments, conclusions and recommendations contained in the studies and analyses carried out between 2011 and 2019. The sources used are:

- Peer Review of the Estonian Research and Innovation System: Final Report (Under the Horizon 2020 Policy Support Facility), (2019)<sup>3</sup>;
- European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews, Country Report Estonia (2020);
- studies carried out or commissioned by the Estonian Research Council and RDI policy monitoring studies (completed in the period 2014-2019)<sup>4</sup>;
- studies and reviews related to smart specialisation (completed in 2017-2020)<sup>5</sup>;
- innovativeness of Estonian enterprises and opportunities for supporting innovation (2015)<sup>6</sup>;
- report of the Economic Development Working Group (2016)<sup>7</sup>;
- Green Paper on Industrial Policy (2017)<sup>8</sup>;
- report of the Task Force on Long-term Financing of Higher Education and Research and the Action Plan endorsed by the Government of the Republic (2018)<sup>9</sup>;
- plan to boost entrepreneurship and innovation (2018)<sup>10</sup>;
- productivity development scenarios 2035 (including a study on global and local value chains) (2018)<sup>11</sup>.

## International recommendations for the development of Estonian RDIE

The Strategy takes into account **the assessments and recommendations of international experts**. These include the country-specific recommendations made in the Policy Support Facility report 'Peer Review of the Estonian Research and Innovation System' and in the context of the European Semester.

### External experts have highlighted five key recommendations:

1. ensure political commitment to the importance of R&I in national policy and the 1% target for government spend on R&D;
2. establish and implement thematic priorities for R&I policy, in the light of the societal challenges and Estonia's smart specialisation strategy;
3. establish an innovation agency to support R&D and build absorptive capacity;
4. strengthen the system of 'intermediary organisations' able to support industrial innovation;
5. modernise and 'profile' research at the universities, making them better adapted to innovation and the production of human capital to meet national needs.

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3 [\[link\]](#)

4 An overview on the Estonian Research Council's website [\[link\]](#)

5 An overview on the Estonian Research Council's website [\[link\]](#)

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## According to the EU's European Semester assessments, Estonia should focus on:

- promoting research and innovation capacity and the uptake of cutting-edge technologies;
  - improving innovation performance and boosting productivity growth in areas of smart specialisation;
  - increasing the number of innovative enterprises in areas of smart specialisation;
  - strengthening the provision of research and innovation by increasing the attractiveness, competitiveness and sustainability of the research system and diversifying the fields of applied research;
  - supporting research cooperation between universities and enterprises, enabling technology transfer, commercialisation of research results, and increasing the capacity and role of clusters and centres of excellence;
- promoting digitalisation:
  - encouraging the uptake of ICT (including digitalisation, marketing and e-commerce) by SMEs;
  - increasing the public sector's capacity to analyse and securely manage open and big data;
  - increasing and improving the user-friendliness of public e-services, including in a cross-border context;
- promoting the growth potential and competitiveness of SMEs:
  - internationalising their activities so that they can move up the global value chain;
  - increasing the productivity and growth potential of SMEs;
  - promoting entrepreneurship and increasing the survival rate of start-ups;
  - identifying new export markets and encouraging participation in international cooperation networks and clusters;
- helping enterprises develop the skills needed for smart specialisation, industrial restructuring and entrepreneurship;
  - providing SMEs and research institutions targeted training in management skills, innovation and technological transfer, and retraining in the field of smart specialisation;
  - increasing the capacity of universities and R&D institutions to improve the economic viability of research projects and their relevance to market needs, including by facilitating the mobility of researchers between R&D institutions and enterprises;
  - improving the level of digital skills in enterprises to boost their productivity;
- promoting energy efficiency measures and renewable energies, including mediating the energy consumption of enterprises, improving the energy efficiency of SMEs, supporting the transition to renewable energies;
- promoting the transition to a circular economy;
- addressing climate change adaptation, risk prevention and building resilience to natural disasters.

## Guidelines from the RDIE committees

In addition to analyses and studies, and in order to ensure coherence with other relevant strategies, the Strategy follows the guidelines of the RDIE committees – the Innovation Policy Committee (IPC), the Research Policy Committee (RPC) and the Research and Development Council (RDC). The following guidelines are the most important:

- to focus R&D more on supporting the development of Estonian enterprise and society, and to set an objective of the Strategy to address the development needs formulated in Estonia's long-term development strategy 'Estonia 2035';
- to focus the new Strategy on growth in productivity and added value in the short, medium and long term by encouraging the growth of private-sector R&D investments;
- to streamline the governance of the sector and redefine the roles and responsibilities of ministries;
- to facilitate the movement of researchers and engineers between universities, enterprises and the public sector;
- to make strategic choices with the necessary funding decisions;
- to find better ways to define R&D contracts;

- to improve the innovation capacity of the private sector;
- to take into account the country-specific recommendations made in the Policy Support Facility report 'Peer Review of the Estonian Research and Innovation System';
- to take into account the UN Sustainable Development Goals (SDGs), the EU's climate targets and the European Green Deal when preparing the Strategy and its programmes.

Next, the development needs in the field of RDIE are outlined, based on studies and analyses, and feedback from target and stakeholder groups. More than 70 partner representatives attended the target and stakeholder engagement seminars (see **Annex 4**). The development needs in the field of RDIE were discussed in greater detail in the statement of intent for the Strategy approved on 12 September 2019, and only a shortened version is reproduced here.

## Development needs of the research system

**A researcher's career is not attractive in Estonia, and maintaining a high level of research is not guaranteed.**

### Main challenges

1. There is no career model that offers a variety of development paths and stability, competitive pressure is high (research grants), the continuation of a research career depends on the success of the next project application, there is no soft landing in case of failure.
2. The quality of research is evaluated solely on the basis of publications, the success of a researcher is determined by the classification and number of publications, and little consideration is given to other aspects of the impact of the researcher's work, such as the knowledge transfer, teaching, advisory activities, etc.
3. Estonia's research system is not an attractive environment for talents: small research teams, lack of funding and uncertain career paths force talented young people to look for opportunities to pursue careers in the world's top research centres.
4. It is essential to develop and implement a career model that supports and motivates the transfer of knowledge and experience between sectors.
5. There is no functioning spin-off model. Success stories of research-based start-ups would be a strong motivator for students and researchers, and would also promote the value of R&D professionals to private sector employers.

**The model of managing modern research infrastructure (laboratories, equipment) created with the support of the Structural Funds is not sustainable.**

### Main challenges

1. Limited take-up: the use of research infrastructure is uneven and many facilities are underused.
2. Rapid depreciation: research equipment is depreciating at an accelerated pace due to the rapid development of R&D itself, i.e. in 5–7 years some of the equipment may be morally obsolete.
3. The current funding model is unsustainable as it does not encourage efficient infrastructure management and the creation of reserves for future upgrades of infrastructure.
4. State aid rules limit the opening-up of use: the economic activities carried out with the acquired infrastructure must fall within the scope of the state aid exemption for research and development, and this discourages research institutions from taking the initiative to provide services for a fee.
5. Mutual misunderstanding between enterprise and public R&D institutions: enterprises are not aware of the laboratory services on offer and, where they are, they expect fast, efficient and competitive services; research institutions are not prepared to provide services from their own resources. The potential market is too small for the provision of services under market rules.
6. Laboratories are not accredited or have no right to provide the necessary certification services to enterprises: if there is no laboratory in Estonia with the necessary accreditation or certification right, enterprises buy services from abroad.

**Research results and input from researchers are little implemented for addressing the challenges faced by Estonian society.**

**Main challenges**

1. Awareness of the potential impact of the research system on the development of society through education, knowledge transfer and research results is inadequate among members of society, including enterprises, and scientific achievements are not widely known.
2. The ability of members of society, including enterprises, to formulate research questions and use research results is limited.
3. The research system is not well prepared to deal with issues that are relevant to Estonian enterprises. Enterprises are forced to carry out laboratory tests and certifications in target export markets.
4. RDIE policymaking does not place enough value on a research-based approach.
5. There is little understanding that research is a prerequisite for quality of higher education.
6. Cross-sectoral R&D cooperation is weak and fragmented.

**The potential of international R&D cooperation has not been fully exploited.**

**Main challenges**

1. International research cooperation is not sufficiently focused thematically and more strategic choices are needed for more effective engagement.
2. Estonian researchers are not very active as consortium builders and project coordinators, and their capacity and ability to take the lead and engage new audiences needs to be strengthened.
3. Infrastructure is not used to its full potential when participating in international research.
4. Export of science (contractual cooperation between research institutions and foreign enterprises) is low.
5. There are no clear criteria and decision-making mechanisms to support research cooperation with third countries.

## Development needs for development activities and innovation

**The capacity of Estonian enterprises (in terms of ambition, skills and finance) to adapt and adopt new knowledge and technologies is low.**

**Main challenges**

1. Private investment in R&D is low and limited to a small number of enterprises. There are few large and medium-sized enterprises in Estonia with the internal resources (people, financial resources) to engage in RDI.
2. The share of intangible assets in total investment is low for Estonian enterprises. There is a need to increase the use of technologies related to digitalisation to increase the added value of enterprises.
3. Estonia's tax system does not provide incentives for enterprises to invest in R&D.
4. The participation and position of Estonian enterprises in global and local value chains is limited. There are shortcomings in, among other things, knowledge-based product development, staff training, organisational and business process development, brand development, design and R&D activities.
5. The number of staff and engineers with R&D experience and knowledge outside academia is low, doctoral studies prepare people for academic careers while failing to provide sufficient knowledge and skills required in the private sector.
6. Enterprises do not see a role for RDI in their business model, have little experience in implementing RDI, and lack the capacity (including financial) and expertise to engage the RDI needed for a development leap.
7. There is little cooperation between enterprises and (foreign) universities and other R&D providers, including low mobility between academia and the private sector.
8. The circular economy principles are being poorly implemented and opportunities under-exploited.



## **Research results are not applied in business. Estonia produces few breakthrough innovations.**

### **Main challenges**

1. Constraints of institutional, infrastructure and human resources prevent enterprises from providing the necessary applied research and development activities.
2. The research system and academic careers are centred on academic achievements (including publications, patents), knowledge transfer and application are undervalued, and researchers, therefore, focus on academic outcomes.
3. Research information (both from basic and applied research) is not available in a user-friendly format to the wider public, including enterprises; there is a lack of awareness of research results among enterprises; research data are not accessible.
4. Both enterprises and research institutions have limited knowledge and skills on how to create, manage and exploit intellectual property.
5. Estonia's environment for the protection of intellectual property is not adequate for today's challenges.
6. The profitable knowledge transfer capacity of university technology transfer centers is limited and the system is fragmented.

## **The start-up ecosystem is not sustainable and the potential of start-ups as drivers of innovation needs to be enhanced.**

### **Main challenges**

1. Funding opportunities for research- and technology-intensive enterprises that have reached the growth phase are limited compared to the start-up phase.
2. Start-ups continue to struggle with a shortage of highly qualified staff, especially experienced managers with a wide network of contacts.
3. The organisation of public services (e.g. healthcare, general education) and the living environment are not attractive to foreign talent.

## **The role of the state in driving innovation and shaping the demand for innovation is modest.**

### **Main challenges**

1. The role of the state in driving demand for innovation is weak (including legislation favouring new business models, procurement to promote innovation, R&D obligations of state-owned enterprises, and valuing PhD holders in the public sector). There is a lack of horizontal policies and tax systems that encourage R&D investment and the deployment of human resources.
2. Legislation, including regulation of the business environment, and lack of flexibility in the labour market are not conducive to innovative solutions and new forms of entrepreneurship.
3. The state does not use adequate policy measures to create an environment conducive to innovation (e.g. development of low-resource technologies, support to the circular economy, development of quality infrastructure, etc.).

## **Development needs of the business environment**

## **The development of the international competitiveness of the business environment has slowed down.**

### **Main challenges**

1. The number of requirements imposed on enterprises is not proportionate to their size, and there are insufficient automated and real-time service possibilities for compliance.
2. Enterprises apply few modern management approaches.
3. Enterprises use and implement few digital solutions, both in internal and external processes.
4. The business culture (few responsible enterprises, etc.) is not conducive to increasing the international credibility and reputation of the Estonian business environment.
5. There is a lack of cooperation and partnership between market actors (branch associations, clusters, consumers, etc.).

6. The EU's internal market is not functioning efficiently, and the EU's regulatory environment is not conducive to enterprises offering services and products across borders.
7. There is limited access to funding (capital) for businesses, including in remote areas located away from larger population centres.
8. Professionals are hard to find.
9. Entrepreneurship continues to require development and support to encourage more ambitious business ideas.
10. The state needs to ensure that the business environment is designed, digitised and automated according to the needs of public service users, including by using innovative solutions (artificial intelligence, event-based, proactive, and real-time services).

**Estonia's economy is characterised by relatively little export of high value-added goods and services, resulting in limited international recognition of Estonian products and services.**

#### **Main challenges**

1. Enterprises' ability to identify market signals that tell them which products and services are needed in the market is poor.
2. High value-added products and services account for a small share of enterprises' product portfolios.
3. Enterprises' awareness of the services offered by the state to overcome export barriers (FTAs, market reviews, etc.), including awareness of the rules on trade measures (technical barriers, technical norms, standards, conformity assessment procedures, subsidies, different customs procedures) and quantitative restrictions (import quotas, licences) is low.
4. The diversity of export channels and destinations is limited (e-commerce opportunities are under-utilised; market players lack courage and awareness).
5. Public-private cooperation to boost exports is not well targeted.
6. Estonia's visibility and reputation as a strong industrial country in foreign markets is low.

**Estonia's capacity to attract high value-added foreign investment is weak.**

#### **Main challenges**

1. Input costs of production are not competitive compared to reference countries.
2. The R&D intensity of foreign investment is low and foreign investments are poorly linked to the valorisation of local resources.
3. Due to the way the tax revenue is distributed, local authorities are not interested in attracting foreign investment.
4. Transport links (including international) are inadequate.
5. There is a shortage of the top professionals needed by enterprises.

## Challenges for the governance of the RDI system

#### **Main challenges**

1. The RDI system is fragmented, and the responsibilities and tasks of the actors in the system (MoER, MoEAC, other ministries, universities, state and public R&D institutions, private R&D institutions, competence centres, science parks etc) do not form a coherent network. In organising the RDI system, it is necessary to ensure that the responsibilities and roles of all actors in the system are clearly defined. Where necessary, the relevant legislation needs to be reviewed and the institutional structure redesigned.
2. Co-operation and co-ordination between RDIE policy makers is weak. Building a knowledge-based society requires that all policies are driven by research, development and innovation. Inadequate coordination in turn leads to fragmentation of activities: different actors may design and interpret the RDI policy differently. In order to create synergies and increase impact, it is necessary to effectively coordinate the cooperation between the actors of the system (ministries, implementing bodies, business representative organisations, research institutions, etc.) and to define their responsibilities.
3. Specialisation and cooperation between research institutions is weak. While in higher education, university specialisation has been achieved across 'areas of responsibility', this approach has not yet been applied in research and development. To improve the efficient use of resources, the network of research institutions needs further consolidation, and opportunities need to be found for profiling the RDI activities of R&D institutions, including universities, for greater cooperation and more efficient use of resources, including the development of (joint) services across universities (e.g. Adapter).
4. There is no consensus in Estonian RDI policy regarding which major future directions and challenges Estonia should be focusing on, which strengths it should be developing, and which future challenges the joint efforts of RDI and business should be directed towards.

# Annex 2. Strategic framework for the Strategy

## International and EU strategic framework related to the Strategy

**Estonia's EU Policy Priorities for 2020-2021 (EUPOL)**<sup>12</sup> state that in order to maintain and increase Europe's global competitiveness, the capacity for innovation and the knowledge-intensive economy must grow. The RDIE Strategy is closely linked to the priorities related to the development of the economic base and the construction of a climate-neutral, green, fair and social Europe. The knowledge transfer axis of the Strategy aims to improve synergies between the Estonian research system, enterprises and the state, to ensure that the innovation capacity of enterprises grows and research results have a greater impact on society and the economy. The business environment axis focuses on the growth of research-intensive enterprises. With this in mind, in implementing the activities of **the European Institute of Innovation and Technology (EIT)**<sup>13</sup> under the third pillar 'Innovative Europe' of the Horizon Europe, Estonia has been working to ensure that existing and future Knowledge and Innovation Communities (KICs), which develop entrepreneurial and innovation capacity by integrating education, business and research, are more open to new partners with lower innovation capacity. Estonia is currently represented in eight KICs. In the ongoing negotiations regarding the regulation on the European Institute of Innovation and Technology (EIT)<sup>14</sup> and its Strategic Innovation Agenda 2021-2027<sup>15</sup>, Estonia has been advocating for the EIT KICs to be more open and accessible to new partners. It is important to ensure open and transparent access to innovation funding at the EU level and to ensure cooperation between centres and remote regions.

The three axes of the Strategy – the research system, knowledge transfer and the business environment – are, in principle, in line with the objectives of the **EU's Framework Programme for Research and Innovation 'Horizon Europe'**<sup>16</sup> as well as with the broader priorities and objectives of the **European Research Area (ERA)**. The aim of the Framework Programme is to support the creation of cutting-edge knowledge and technologies, to increase the impact of research and innovation on society and the economy by fostering the uptake of innovative solutions, and to address global challenges in a targeted way, thereby boosting the global competitiveness of Europe and its Member States. The research system axis of the Strategy aims to achieve a high level of research, which requires, among other things, the possibility for researchers to participate in international cooperation and to make use of high-quality research infrastructures. In order to raise the level of excellence and competitiveness of research in smaller and more remote countries such as Estonia, intersectoral and cross-border cooperation, mobility, openness and inclusiveness, as well as removing barriers to participation, are considered essential in implementing the framework programme, as this allows the transfer of knowledge and mutual learning between different actors in the RDI. The European Commission's Communication on the new European Research Area<sup>17</sup> also stresses the need for scientific excellence to be more accessible to all Member States and for strong research and innovation systems to be more evenly distributed across Europe.

One of the objectives of the Strategy is to increase the impact of RDI policies so that research and innovation more clearly address societal and economic objectives. A more effective transfer of research results to the economy and their application for the benefit of society is also highlighted as a broader objective in the concept of the new European Research Area. More specifically, a clearer link between research and innovation policy objectives and societal challenges will be drawn in the framework of the programme 'Horizon Europe', the second pillar of which, 'Global challenges and European industrial competitiveness', will support collaborative R&D projects addressing societal challenges and supporting industrial leadership. This approach also contributes to the **EU's Sustainable Development Strategy and the UN's Sustainable Development Goals**<sup>18</sup>. The EU's current sustainable development principles are based on the EU Sustainable Development Strategy which was revised in 2006<sup>19</sup>. The Sustainable Development Strategy identifies

<sup>12</sup> The EU policy priorities of Estonia for 2020-2021 (EUPOL), approved by the Government of the Republic on 21 November 2019

<sup>13</sup> [link](#)

<sup>14</sup> [link](#)

<sup>15</sup> [link](#)

<sup>16</sup> [link](#)

<sup>17</sup> [link](#)

<sup>18</sup> The UN declaration 'Transforming our world: the 2030 Agenda for Sustainable Development' was adopted on 25 September 2015. The Declaration sets out 17 Sustainable Development Goals (SDGs), to which Estonia added Goal 18 on the basis of the Preamble to the Constitution and the Sustainable Estonia 21 strategy: Viability of the Estonian cultural space. The European Green Deal is also linked to the Sustainable Development Goals.

<sup>19</sup> [link](#)

seven key challenges, together with tasks, operational objectives and actions: climate change and clean energy, sustainable transport, sustainable consumption and production, conservation and management of natural resources, public health, social inclusion, demography and migration, global poverty, and sustainable development challenges. These challenges are also well aligned with the UN Sustainable Development Goals.

Climate change is undoubtedly one of the global challenges that RDI should address. **The European Climate Law**<sup>20</sup> sets the goal to achieve climate neutrality by 2050. **The European Green Deal**<sup>21</sup> takes a cross-sectoral approach to this objective by proposing a new strategy for growth that is decoupled from resource use. As the need for innovative solutions is cross-cutting in the context of the European Green Deal, research and innovation will play a central role in delivering the objectives of the Green Deal.

EUPOL priorities for 2020-2021 state that the transition to a climate-neutral economy by 2050 will create many new opportunities for our enterprises and citizens, but will also test them. In defining the focus areas for RDIE, global trends (including climate challenges), the mentioned EU Strategic Framework and the UN Sustainable Development Goals (SDGs) were among the starting points.

### **EU digital package**

The Commission's digital package 'A Europe fit for the digital age' aims to ensure that the EU embraces the digital transition and takes the lead in all digital areas. The digital transition is already affecting lives and working conditions, and creating new ways of connecting, communicating, doing business and addressing societal challenges, including climate change and the transition to the green economy. The Digital Package consists of a strategy for Europe's digital future, a European data strategy and a white paper on artificial intelligence. The EU's strategy for the digital future aims to ensure that people and enterprises benefit from the digital transition and to help Europe become climate neutral by 2050. The aim of the European data strategy is to create a single market for data, to allow data to move freely within the EU and between sectors, thereby boosting the competitiveness of the EU economy and making the EU a leader in a data-driven society. Greater interoperability and take-up of data will provide opportunities for the development of new services and products, as well as for increasing the EU's market power at global level. In the White Paper on Artificial Intelligence, the European Commission sets out a framework for trustworthy artificial intelligence, based on excellence and trust, which aims to encourage the development of new technologies in Europe, to engage enterprises and to build citizens' trust in the wider use of these technologies. RDIE strategy directly contributes to the objectives of the EU Digital Package. Digitalisation and the development and application of digital technologies are at the heart of the actions within the Strategy; for example, one of the RDIE focus areas promotes the application of digital solutions in all areas of life.

### **A comprehensive EU industrial strategy package**

The EU's comprehensive industrial strategy<sup>22</sup> covers three main areas: industry, small and medium-sized enterprises and the internal market. In order to maintain the leading position of European industry, the European Commission's new industrial strategy aims to deliver on three key priorities: maintaining the global competitiveness of European industry and a level playing field at home and globally, making Europe climate-neutral by 2050 and shaping Europe's digital future. The strategy sets out the main directions for the transformation of European industry and proposes future actions.

- To strengthen the EU's internal market, the Commission presented on 10 March 2020 a Single Market Enforcement Action Plan to further develop the EU's internal market, a report on barriers to the internal market and a strategy for small and medium-sized enterprises, and intends to pursue the activities of the European Data Strategy to boost the EU's data economy.
- The intellectual property action plan aims to preserve technological sovereignty, promote a global level playing field, better combat intellectual property theft and adapt the legal framework to green and digital transitions.

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<sup>20</sup> [\[link\]](#)

<sup>21</sup> [\[link\]](#)

<sup>22</sup> [\[link\]](#)

- The review of the EU's competition rules, including the fitness check for merger control and state aid guidelines, should ensure that EU rules are fit for purpose in a rapidly changing situation where the economy is becoming increasingly digital, needs to become greener and is moving in the direction of a circular economy.
- To ensure fair competition at home and abroad, in addition to maximising the use of trade defence mechanisms, the European Commission will adopt a White Paper by mid-2020 to address the distortive effects of foreign subsidies on the Single Market and to address access to EU public procurement and funding. The Commission will propose legislation on external subsidies in 2021, while the WTO global rules on industrial subsidies will be strengthened and reciprocal access to public procurement in third countries will be established.
- Measures to modernise and decarbonise energy-intensive industries, to support sustainable and smart mobility industries, to promote energy efficiency, to reinforce existing instruments to reduce carbon leakage and to ensure an adequate supply of low-carbon energy at competitive prices (including the Fair Energy Transition Fund, the Carbon Border Adjustment Mechanism, the Sustainable and Smart Mobility Strategy, the further development of a common European energy data space, etc.).
- Increasing Europe's industrial and strategic autonomy by ensuring the supply of critical raw materials through an action plan for critical raw materials and pharmaceutical products based on the new EU pharmaceutical strategy, and by supporting the development of strategic digital infrastructure and key enabling technologies.
- As regards the circular economy, the European Commission will present an action plan on the circular economy, but will also propose measures on batteries, textiles and electronics.
- The Clean Hydrogen Alliance to accelerate industrial decarbonisation and maintain industry leadership, followed by Alliances on Low Carbon Industries, Industrial Clouds and Platforms, and Raw Materials.
- Legislation and guidance on green public procurement.
- Renewed focus on innovation, investment (including cPPPs<sup>23</sup> under Horizon Europe) and skills.

In addition, the Commission will systematically analyse the risks and needs of industrial ecosystems. For this analysis, the Commission will work closely with the Industrial Forum, which will be composed of industry representatives, including SMEs, large enterprises, social partners, researchers and representatives of Member States and EU institutions. Where appropriate, experts from specific sectors will be invited to share their expertise and the Commission's annual industry days will continue.

### **IPCEI value chains**

Value chains in the strategic common interests of the European Union constitute an intervention logic whereby representatives of the Member States and the private sector agree on technologies whose joint development is key to the competitiveness of the European Union economy. Six so-called IPCEI (Important Projects for Common European Interest) value chains have been identified<sup>24</sup>. Each of them has great potential to contribute to Europe's green and digital transformation to boost the competitiveness of European industry. The new value chains agreed upon by the IPCEI Strategic Forum in 2018 are Smart Health, Cybersecurity, Autonomous Vehicles, Hydrogen Technologies, Low-carbon Industry, and the Industrial Internet of Things. The IPCEI value chains were instrumental in defining RDIE focus areas.

### **European Union Structural Funds**

The activities under this Strategy will be financed from EU Structural Funds. The European Regional Development Fund (ERDF) is primarily involved in R&D and innovation. R&D, innovation and entrepreneurship activities will be supported under Objective 1 of the Cohesion Policy, 'A Smarter Europe', for which a smart specialisation strategy and its governance mechanism are a prerequisite. For the smart specialisation strategy, it is important to set up a management mechanism and to define the roles and responsibilities of the institutions and management bodies involved in the development, coordination and monitoring of the smart specialisation strategy. In the implementation of the smart specialisation strategy, the Entrepreneurial Discovery Process, involving representatives from enterprises, R&D institutions, civil society and the public sector (quadruple helix), plays an important role. The Entrepreneurial Discovery Process identifies priority areas, monitors their development on an ongoing basis and revises them as necessary. This Strategy outlines the areas of smart specialisation and governance set out as a precondition for the use of Structural Funds (see the chapter on governance and organisation).

<sup>23</sup> Contractual Public-Private Partnership

<sup>24</sup> [link](#)

## National strategic foundations

**Estonia's long-term development strategy 'Estonia 2035'** describes Estonia's most important cross-sectoral development needs. These development needs are instrumental in defining RDIE focus areas. Addressing the development needs formulated in the 'Estonia 2035' strategy is an important part of this Strategy. Of the three axes of the Strategy, the knowledge transfer axis is the one that will ensure synergies between the research system, business and the state for the benefit of society and the economy, taking into account the development needs outlined in the 'Estonia 2035' development strategy.

The 'Estonia 2035' strategy highlights nine key areas of development needs: population, health and life expectancy of people, social opportunities, educational opportunities, business environment, biodiversity and the environment, cultural space and the living environment, security and safety, and governance. Five strategic objectives have been identified to address the development needs. The RDIE Strategy contributes to the achievement of all strategic goals of the 'Estonia 2035' strategy.

Strategic goal of the 'Estonia 2035' strategy	Contribution of the RDIE Strategy
<p><b>People.</b> Estonia is home to people who are smart, active and care about their health.</p>	<p>Linked to this strategic objective are, in particular, the axes of the research system and business environment, but also the knowledge transfer axis:</p> <ul style="list-style-type: none"> <li>• Linking higher education and research, support for entrepreneurial Doctoral studies, development of Estonian professional and scientific language.</li> <li>• Adoption of modern business models and forms of working and the appropriate technological solutions.</li> <li>• Developing the skills for smart entrepreneurship and making Estonia an attractive talent environment</li> <li>• Popularisation of science, including in the fields of science, technology and creative studies.</li> </ul>
<p><b>Society.</b> Estonia's society is caring, cooperative, and open.</p>	<p>Linked to this strategic objective are, in particular, the axes of the research system and business environment:</p> <ul style="list-style-type: none"> <li>• Developing social, health and employment services, supported by the uptake of evidence-based digital solutions and the interconnection of datasets.</li> <li>• Personalised medicine solutions, including the integration of genetic and health data into evidence-based decision making processes in both therapeutic and preventive medicine, and appropriate digital solutions.</li> </ul>
<p><b>Economy.</b> Estonia's economy is strong, innovative, and responsible.</p> <p><b>Indicators:</b> labour productivity as a share of the EU average, R&amp;D expenditure in the private sector, and resource productivity.</p>	<p>Linked to this strategic objective are, in particular, the knowledge transfer and business environment axes:</p> <ul style="list-style-type: none"> <li>• New solutions to stimulate RDI in enterprises, including innovation services and support for enterprises, intersectoral mobility, applied research and experimental development</li> <li>• Supporting digitalisation and automation in enterprises, implementing the real economy</li> <li>• Capacity building in areas important for the Estonian economy (activities in the RDIE focus areas, including growth areas of smart specialisation)</li> <li>• Creating a flexible business environment that promotes innovative and responsible entrepreneurship and fair competition, including outside Harju County</li> <li>• Supporting the transition to a low-carbon and circular economy</li> </ul>
<p><b>Living environment.</b> Estonia offers a safe and high-quality living environment that takes into account the needs of all its inhabitants.</p>	<p>Linked to this strategic objective are the research system, knowledge transfer and business environment axes:</p> <ul style="list-style-type: none"> <li>• Developing and applying innovative technologies, including information technologies, to improve the living environment</li> <li>• Smart planning of the living environment, taking into account the needs of society, population change, health and protection of the environment, including by integrating technological and economic solutions</li> <li>• R&amp;D contribution in the field of cultural heritage</li> <li>• Valorisation of local resources</li> <li>• The contribution of RDI to safe, green, competitive, needs-based and sustainable transport and energy infrastructures</li> </ul>



**Governance.** Estonia is an innovative, reliable and people-centred country

Linked to this strategic objective are the research system, knowledge transfer and business environment axes:

- Improving the quality of public services and reducing red tape, including the provision of public services to enterprises through a single digital gateway and the implementation of the real economy, higher quality services and a support system for enterprises (creation of an Innovation Agency).
- Contribution of the RDI to the development of Estonia as a digital country, including in the fields of data economy and cyber security
- Enhancing the attractiveness, competitiveness and sustainability of the research system, including the capacity for knowledge management, knowledge transfer and communication of research results
- Creating a regulatory and tax environment conducive to innovation

**Education Strategy 2035.** Coherence between research and higher education ensures high quality higher education and training of the workforce. The quality of higher education, in turn, depends on the quality of the research done in the field. This Strategy is linked to the implementation of all the strategic objectives of the Education Strategy, including: evidence-based development of the education system, the involvement of researchers from different fields in educational processes and policy making; increasing innovation capacity and enhancing cooperation between educational institutions and the labour market (enterprises) in innovative development activities; supporting the participation of enterprises in global value chains, including in the creation and deployment of cutting-edge technologies, through education and R&D activities; popularisation of science, technology and innovation and extra-curricular education in science, technology and creativity; development of the OSKA system<sup>25</sup>; link with RDIE focus areas, in particular in the context of the growth areas of smart specialisation; entrepreneurship education. Fostering entrepreneurial mindsets and entrepreneurship in the education system is addressed in the Education Strategy through enhancing entrepreneurship education. Entrepreneurial skills will be developed at all levels and in all types of education; and further training opportunities and flexible learning pathways will encourage adults to make more effective use of their labour market potential, including by starting their own enterprises.

At a more general level, the Education Strategy concerns questions of matching (higher) education to labour market needs and of the skilled workforce, the new generation of researchers and entrepreneurs coming from pre-school, basic and secondary, vocational, training and retraining, and from the extra-curricular education system, as well as the evolution and development of the individual and, more specifically, the promotion of entrepreneurship, on which the RDIE strategy does not focus.

**Youth Strategy 2035.** The following links with this Strategy can be highlighted: evidence-based development in the field of youth, involvement of researchers from different disciplines in policy-making in this field, including the use of research results to develop interventions and services for young people; entrepreneurship and entrepreneurship education, popularisation of science and science education (including extracurricular science education), including the promotion of science and technology and creative education.

**Estonian Language Strategy 2035.** This Strategy concerns in particular the development of Estonian language for higher education and science, including the creation and use of Estonian-language vocabulary in all fields of research and life, and the preservation and development of Estonian-language higher education and science. Within the framework of the Strategy, we will support high-level scientific research into the Estonian language, history and culture and the development of language technology solutions.

**Welfare Strategy 2016-2023.** The Welfare Strategy addresses labour market and working life issues, which are of particular importance in ensuring the presence of a skilled workforce and the next generation of talent for R&D and entrepreneurship.

<sup>25</sup> A system for monitoring and forecasting labour demand, designed to provide comprehensive information across all sectors of the economy on how many and what skills will be needed over the next five to ten years. In the field of education policy, OSKA helps to plan the number of school places and to introduce employment opportunities to young people. In labour market policy, OSKA's research is used to design and provide labour market services aimed at preventing unemployment and developing skills, and in economic policy to support economic sectors, in particular by improving labour supply.

**Green Paper on Industrial Policy** The main objective of the Green Paper on Industrial Policy is to increase the competitiveness of Estonian industry. In order to achieve its objective, the Green Paper focuses on the following areas: digitalisation of industry, R&D, access to finance, labour, infrastructure, natural resources and the regulatory environment. This Strategy is linked to all key areas of the Green Paper on Industrial Policy.

**Basic principles of Estonian export policy.** The document is one of the starting points for planning the export policy activities under the Strategy.

**Estonian business diplomacy strategy.** The document is one of the starting points for planning the export policy activities under the Strategy.

**Foreign Policy Strategy 2030** The document is one of the starting points for planning the export policy and external economic relations activities under the Strategy.

#### **Consistency with other strategies:**

Estonia's National Energy and Climate Plan until 2030  
National Strategy of the Energy Sector until 2030  
The Estonian Environmental Strategy 2030  
General Principles of Earth's Crust Policy until 2050  
Climate Change Adaptation Strategy until 2030  
General Principles of Climate Policy until 2050  
Agriculture and Fisheries Strategy until 2030  
Forestry Strategy until 2030

Public Health Strategy until 2030  
General Principles of Cultural Policy until 2030  
General Principles of the Estonian Sports Policy until 2030  
Transport and Mobility Strategy 2021-2035  
Information Society Strategy 2030  
National Defence Strategy 2017-2026  
Internal Security Strategy 2030  
Population and Cohesive Society Strategy 2030

- The RDIE Strategy contributes to cross-cutting implementation of the knowledge and evidence-based approach. A high level of scientific excellence and coherence with the needs of society, including the economy, will create the preconditions for increased knowledge, better education and more effective and relevant policies. Through a research-based approach, the causes of problems will be better understood and more effective solutions will be found. This will increase positive impacts and reduce negative impacts in all policy areas.
- The binding element of the RDIE Strategy and the other strategies is the research and development, innovation and entrepreneurship in each area.



# Annex 3. Methodology and sources of indicators

**GENERAL OBJECTIVE:** Estonian research, development, innovation and entrepreneurship work together to increase the well-being of Estonian society and the productivity of the Estonian economy, providing competitive and sustainable solutions for the development needs of Estonia and the world.

## Indicator 1. R&D funding as a share of GDP (Statistics Estonia)

**Short description of the indicator:** the share of R&D funding in a country's gross domestic product is an indicator of R&D intensity reflecting the importance of R&D for the country. Expenditure is measured as a percentage of GDP.

**Assumptions for setting the target:** the target has been set in view of the EU's target for the distribution of R&D expenditure, with the private sector contributing 2% of GDP and the public sector 1% of GDP. So far, Estonia has not yet reached this level, and only two countries in the EU exceeded it in 2018, but in the long term we need to move towards it. As regards R&D intensity, it has been noted that on the one hand, it can be seen as an input to the research system, and on the other hand, the resources channelled into the field reflect the importance of R&D activities in society and the country.

**Target level 2035:**  $\geq 1\%$ <sup>26</sup>

**Latest known level:** 0.75% (2019)

## Indicator 2. Private sector R&D expenditure as a share of GDP (Statistics Estonia)

**Short description of the indicator:** measures Business Enterprise Research and Development (BERD) expenditure on R&D as defined in the Frascati Manual<sup>27</sup>. Expenditure is measured as a percentage of GDP.

**Assumptions for setting the target:** the target has been set in view of the EU's target for the distribution of R&D expenditure, with the private sector contributing 2% of GDP and the public sector 1% of GDP. So far, Estonia has not yet reached this level, and only two countries in the EU exceeded it in 2018, but in the long term we need to move towards it.

**Target level 2035:** 2%

**Latest known level:** 0.86% (2019)

<sup>26</sup> 1% of GDP by 2021, further  $\geq 1\%$  of GDP, see also the chapter on budgetary forecast

<sup>27</sup> [link](#)

### Indicator 3. Nominal labour productivity compared to the EU average (Eurostat<sup>28</sup>)

**Short description of the indicator:** The employment rate of the Estonian labour market (79.5%) is clearly better than that of the EU Member States<sup>29</sup>, second only to Sweden – so Estonia's future economic growth will be driven primarily by an increase in labour productivity and/or more foreign labour. The labour productivity indicator shows the value added per person employed in Estonia compared to the average of EU-27. All candidate countries have productivity levels well below the average, and their accession would reduce the average, but not significantly due to their small size.

**Assumptions for setting the target:** in setting the target, it is assumed that convergence of Estonia with Finland and Sweden will continue, and that the strategy will result in Estonia outperforming the EU27 average productivity growth. The baseline scenario is the Ministry of Finance's long-term forecast until 2070, according to which productivity will increase by 2035 to EUR 83,500 per person employed, or 102%. For Estonia to reach 110% of the EU27 average, the average productivity in the EU27 may increase by 50% over the same period. Overall, Estonia is expected to be able to increase productivity more than 2.1% per year faster than the EU27 average.

**Target level 2035:** 110% of the EU27 average

**Latest known level:** 78.7% of the EU27 average (2019)

### Indicator 4. Ranking in the European Innovation Scoreboard (European Commission<sup>30</sup>)

**Short description of the indicator:** The European Innovation Scoreboard (EIS) provides a comparative assessment of the research and innovation performance of EU Member States and certain third countries, and of the strengths and weaknesses of their research and innovation systems. The EIS measurement framework distinguishes between four main types of indicators and ten innovation dimensions, capturing in total 27 different indicators.

Based on their average performance scores as calculated by a composite indicator, the Summary Innovation Index, Member States fall into four different performance groups. Luxembourg, the Netherlands, Sweden, Finland, and Denmark are Innovation Leaders with innovation performance well above that of the EU average. Estonia joins Austria, Belgium, Ireland, Portugal, France, and Germany as Strong Innovators.

**Assumptions for setting the target:** Estonian research is internationally competitive and forward-looking, yet the contribution of R&D to business productivity growth is low. The aim of RDIE is to bridge the gap between research and business and stimulate private sector investment in R&D. This is a prerequisite to move up significantly in the Innovation Scoreboard and to become an Innovation Leader.

**Target level 2035:** Innovation Leader

**Latest known level:** Strong Innovator, 11th place (2020)

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<sup>28</sup> Eurostat, Table: Nominal labour productivity per person employed [\[link\]](#)

<sup>29</sup> Eurostat:tesem010

<sup>30</sup> [\[link\]](#)



**KNOWLEDGE TRANSFER:** Estonia's development relies on knowledge-based and innovative solutions.

### Indicator 1. Business investment in intangible fixed assets as a share of GDP (Statistics Estonia<sup>31</sup>)

**Short description of the indicator:** measures business investment in intangible fixed assets based on national accounts. Fixed assets are tangible or intangible assets produced as output in the production process and used repeatedly or continuously in the production process for more than one year.

**Assumptions for setting the target:** the target is based on the assumption that Estonia will reach Nordic levels by 2035. In 2018, the figure was between 4 and 7.1% in these countries. For Estonia to increase its productivity, more investment in intangible assets is needed.

**Target level 2035:** 6%

**Latest known level:** 2.7% (760 M) (2019)

### Indicator 2. Number of researchers and engineers in the business and non-profit private sectors (Statistics Estonia<sup>32</sup>)

**Short description of the indicator:** measures the number of full-time researchers and engineers per 1000 inhabitants in the business sector and the non-profit private sector. The public sector, i.e. national R&D institutions, is excluded from the calculation.

**Assumptions for setting the target:** along with a significant increase in R&D investment in the private sector, an increase in the number of researchers and engineers working in the sector is expected. The target is set on the assumption that the number of researchers and engineers will increase in proportion to R&D expenditure.

**Target level 2035:** 4.53

**Latest known level:** 1.47 (2019)



**RESEARCH SYSTEM:** Research in Estonia is high-level, effective and diverse.

### Indicator 1. Percentage of Estonian research articles among the 10% most cited worldwide (European Innovation Scoreboard<sup>33</sup>)

**Short description of the indicator:** The share of research articles related to Estonian research institutions in the world's top 10% most cited publications reflects the high quality of the Estonian research system.

**Assumptions for setting the target:** scientific publications are an important benchmark of the quality and excellence of a researcher, institution or research system. The share of research articles related to Estonian research institutions among the world's most cited articles shows the high quality and impact of Estonian researchers' work. The target level of 12.5% in 2018 is roughly in 7th–9th place in the ranking of countries, with the aim of reaching the top third of EU countries.

**Target level 2035:** 12.5%

**Latest known level:** 8.4% (2020)

31 Statistics Estonia RAA0062

32 Statistics Estonia TD01

33 European Innovation Scoreboard

## Indicator 2. Contracted R&D per academic staff in positively evaluated R&D institutions (data of baseline funding, Statistics Estonia<sup>34</sup>).

**Short description of the indicator:** shows the involvement of R&D institutions in addressing the challenges faced by society, in cooperation with the private sector and international partners. On the one hand, it characterises the readiness of R&D institutions to provide competitive services required by the private sector and, on the other hand, it shows the relevance of Estonian R&D institutions' activities in international knowledge networks. Measured on the basis of the baseline funding data of positively evaluated R&D institutions, in absolute terms (in line with the limits set by the baseline funding conditions and procedures) and calculated per academic staff member. The indicator is not internationally comparable as national data sets are either missing or not comparable.

**Assumptions for setting the target:** the volume of contracted R&D activities illustrates the relevance of the activities and competences of R&D institutions to the needs of society and the private sector. Specifically, revenue from national and international R&D grants (R&D subsidies) and contracts directly related to R&D activities, as well as revenue from the sale of licences, patents and protected plant varieties by R&D institutions is taken into account. Includes R&D expenditure funded by the private sector and from external sources (including the EU Framework Programme and other donors). The volume of contracted R&D is expected to increase and the target is set assuming that it will increase in proportion to the increase in overall R&D expenditure. It is also based on the assumption that the benchmark will be met through an overall improvement of research management capacity, the ability of research institutions to provide the necessary services to enterprises and to participate in international cooperation, including e.g. receiving grants from the European Framework Programme. The volume of contracts is calculated per FTE of academic staff (researchers and engineers) in order to compensate for changes due to an increase in the number of staff. The revenue base per academic staff member from contractual cooperation in research institutions is expected to nearly double.

**Target level 2035:** EUR 50,000 per year

**Latest known level:** EUR 26,730 (2019)



**BUSINESS ENVIRONMENT:** Estonia's business environment is conducive to the entrepreneurial spirit and to the emergence and growth of knowledge-intensive enterprises, the creation and export of higher value-added products and services, and investments in all regions of Estonia.

## Indicator 1. Estonia's position in the Doing Business index (World Bank<sup>35</sup>)

**Short description of the indicator:** Doing Business describes, based on objective criteria, how supportive an environment each country is able to provide for enterprises. The indicator comprises six broad thematic areas described by ten sub-criteria relating to the performance of the enterprise. The logic of the index is scenario-driven, i.e. the main steps and activities related to the life cycle of a enterprise are compared by countries. It describes the ease of setting up an enterprise (speed and simplicity of the legal procedures for starting an enterprise), access to the facilities needed for operations (building permits, construction of facilities and connection to the local infrastructure network), access to funding (accessible sources of funding and legal protection for small shareholders), ease of running an enterprise (simplicity of the tax system and access to foreign markets) and a secure business environment (enforcement/cancellation of contracts and fairness of the bankruptcy process). The Doing Business Index is mainly based on scenario-based feedback surveys.

**Assumptions for setting the target:** A competitive business environment is one of the prerequisites for achieving the overarching objective of the Strategy. As the ranking measures a enterprises' costs and the time it takes to complete various transactions, the government can directly influence these indicators.

**Target level 2035:** 5th place

**Latest known level:** 18th place (2020)

<sup>34</sup> Statistics Estonia TD071, researchers and engineers in the higher education sector, FTE

<sup>35</sup> World Bank, Doing Business Project, [link](#)

## Indicator 2. GDP per capita generated outside Harju County as a share of EU average (Eurostat<sup>36</sup>)

**Short description of the indicator:** For Estonia, Eurostat counts Harju County together with Tallinn as the metropolitan area, and all other areas fall outside the metropolitan area. The indicator measures GDP per capita generated in a region and compares it to the EU27 average.

**Assumptions for setting the target:** The benchmark has been set with the objective that GDP per capita in rural Estonia grows faster than the EU27 average. It was deliberately decided not to aim for faster productivity growth in Estonia's rural areas compared to the capital region, as it would be enough to meet the target if enterprises in Tallinn and Harju County were performing poorly.

**Target level 2035:** 59% of the EU27 average

**Latest known level:** 41% (2020)

## Indicator 3. Exports of goods and services (Statistics Estonia)

**Short description of the indicator:** measures exports of Estonian goods and services at current prices based on national accounts.

**Assumptions for setting the target:** The target level is set in view of Estonia's productivity target for 2035. As the Estonian domestic market is limited, we need to find more opportunities in foreign markets to increase added value faster. Although Estonia's exports of goods and services as a share of GDP have declined in recent years, it is expected that the decline will reverse in order to reach the productivity target.

**Target level 2035:** EUR 43 billion

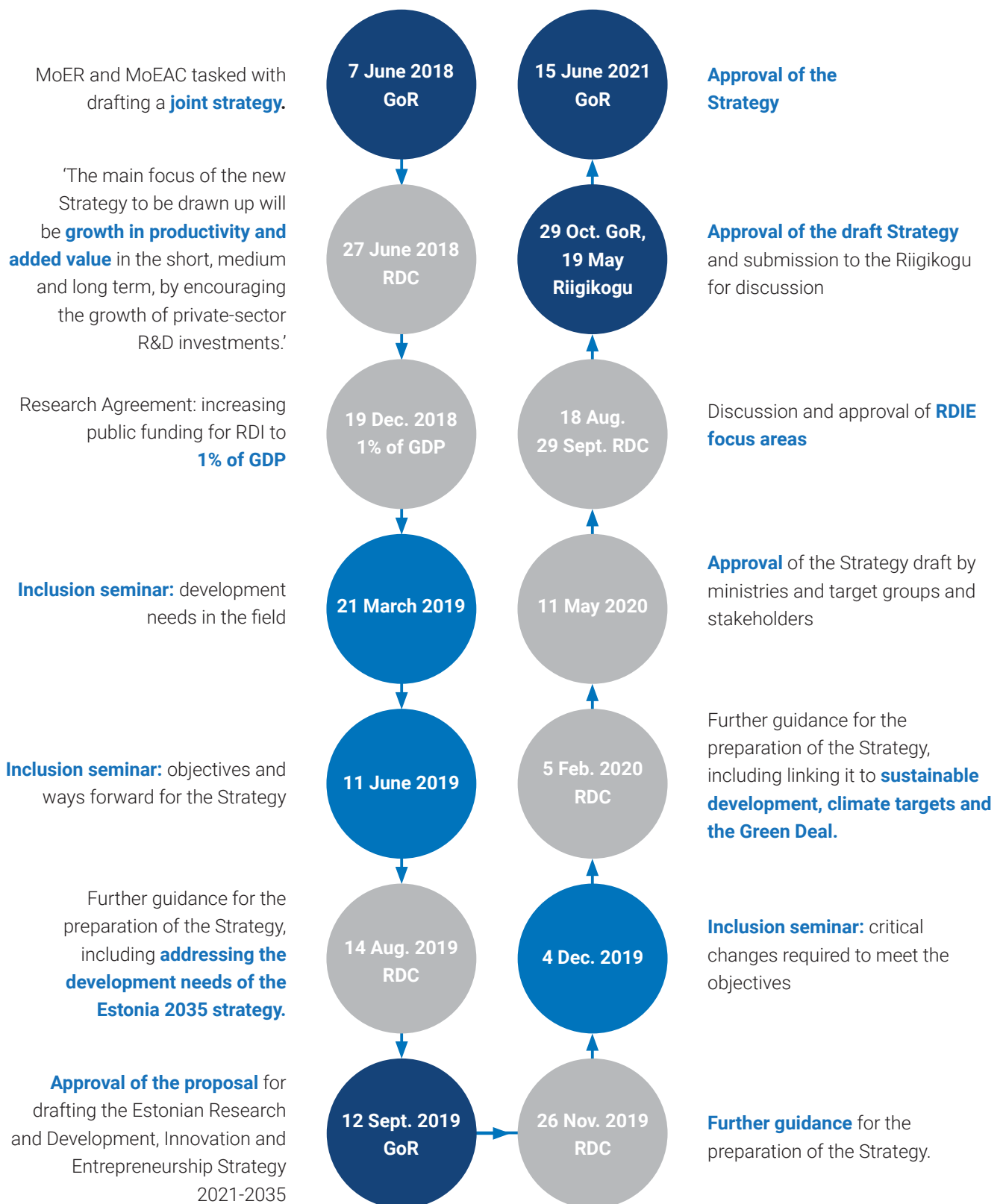
**Latest known level:** EUR 19 billion (2020)

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<sup>36</sup> Eurostat met\_10r\_3gdp

# Annex 4. The process of, and involvement in, preparing the Strategy

## The process of preparing the Strategy



## Organisations represented in the steering and working groups of the Strategy

Steering group	Representatives of the Ministry of Education and Research Representatives of the Ministry of Economic Affairs and Communications Representative of the Government Office Representatives of the Ministry of Finance
Working group	
<b>Ministries, state agencies and foundations</b>	Ministry of Rural Affairs Ministry of Social Affairs Ministry of Defence Ministry of the Interior Ministry of Culture Ministry of the Environment Ministry of Foreign Affairs Estonian Research Council Enterprise Estonia SA KredEx Estonian Qualifications Authority Rural Development Foundation Startup Estonia Statistics Estonia Foresight Centre at the Estonian Parliament
<b>Evaluated research institutions</b>	National Institute of Chemical Physics and Biophysics Center of Food and Fermentation Technologies BioCC OÜ Institute of the Estonian Language Estonian Literary Museum Estonian National Museum Estonian Crop Research Institute Estonian Business School Protobios OÜ STACC OÜ National Institute for Health Development Tervisetehnoloogiate Arenduskeskus AS Under and Tuglas Literature Centre Cybernetica AS
<b>Universities</b>	University of Tartu Tallinn University Tallinn University of Technology Estonian University of Life Sciences Estonian Academy of Arts Estonian Academy of Music and Theatre
<b>Umbrella organisations</b>	Universities Estonia Estonian Rectors' Conference of Universities of Applied Science Estonian Academy of Sciences Estonian Young Academy of Sciences
<b>Umbrella business organisations</b>	Estonian Employers' Confederation Estonian Chamber of Commerce and Industry Estonian Service Industry Association Estonian Association of Small and Medium Sized Enterprises Estonian Business Angels Network (EstBAN) Estonian Private Equity and Venture Capital Association (EstVCA)

## Working group

### Affiliate associations

Finance Estonia  
Estonian Banking Association  
Association of Estonian Marine Industries  
Estonian Electronics Industries Association  
Association of Construction Material Producers of Estonia  
Union of Estonian Architects  
Estonian Chemical Industry Association  
Estonian Forest and Wood Industries Association  
Estonian Logistics and Freight Forwarding Association  
Estonian Association of Information Technology and Telecommunications  
Estonian Woodhouse Association  
Association of Estonian Printing and Packaging Industry  
Estonian Traders' Association  
Estonian Plastics Association  
Estonian Furniture Industry Association  
Estonian Association of Mining Enterprises  
Estonian Clothing and Textile Association  
Estonian Food Industry Association  
Federation of Estonian Engineering Industry  
Estonian E-Commerce Association  
Union of Electricity Industries of Estonia  
Estonian Association of Electrical Enterprises  
Estonian Defence Industry Association  
Estonian Chamber of Agriculture and Commerce  
Estonian Farmers' Federation  
Estonian Organic Farming Platform

### Other organisations

NGO County Development Centres  
Association of Estonian Cities and Rural Municipalities  
AS Metrosert  
Estonian Accreditation Centre  
Estonian Centre for Standardisation and Accreditation  
Responsible Business Forum of Estonia  
Estonian Education Forum



# Annex 5. Assessment of the impact of the Strategy

The Strategy mainly affects the following target groups:

1.	R&D institutions, higher education institutions and their research staff, including researchers, engineers and lecturers <sup>37</sup> ; PhD students as a separate group – better development and career prospects, ensuring the next generation of researchers, better position in society (valuing R&D professionals as workforce and partners).	<p>22 positively evaluated R&amp;D institutions, including 5 public institutions 8 public institutions 9 private institutions</p> <p>19 higher education institutions, including 7 universities, incl. 1 private university 12 universities of applied sciences, incl. 5 private institutions of universities of applied sciences</p> <p>Approximately 9500 research staff<sup>38</sup> 7300 researchers and engineers<sup>39</sup> 4300 teaching staff<sup>40</sup> 2300 PhD students<sup>41</sup> 200 junior researchers</p>
2.	Enterprises, managers and staff of enterprises The following distinction can be made between enterprises: a) innovative R&D-intensive enterprises or (start-up) enterprises with the potential of, and interest in, R&D; b) innovative but not R&D-intensive (start-up) enterprises, e.g. enterprises using new business models; c) 'traditional economy' enterprises with a more modest productivity growth potential. Within this target group, it is the enterprises in the first two groups that have the most to gain from the activities planned in the Strategy. The potential side effects of the Strategy concern in particular the enterprises belonging to the third group (loss of competitive advantage, job losses).	<p>137,980 enterprises 280 R&amp;D-intensive enterprises 1144 start-ups</p>
3.	Policymakers and organisations implementing policy, including local authorities – collaboration with researchers and the application of RDI can help shape and implement more effective and relevant policies, better address societal development needs, and design and deliver better quality public services.	<p>11 ministries 79 local authorities, including 15 cities and 64 rural municipalities</p>
4.	More broadly, the Strategy will have an impact on the whole population through economic growth, increased prosperity and the sustainable development of society.	Total population

37 The target groups of research staff, researchers and engineers and teaching staff also overlap, e.g. researchers also work as lecturers.

38 An employee is involved in R&D if at least 10% of his/her working time is devoted to this activity. There are three categories of staff involved in R&D: researchers and engineers, technical, and service staff, i.e. supportive staff (blue-collar workers, clerical staff, secretaries) involved in or directly linked to R&D projects.

39 All persons holding a degree or a diploma in higher education who, as professionals, are engaged in fundamental and applied research or carry out experimental and developmental work to create new knowledge, products, processes, methods and systems; all teaching staff involved in R&D, as well as managers of research institutions and their subdivisions who design or organise research and technological projects; doctoral and postgraduate students engaged in fundamental research. This excludes people without a university degree who work as researchers or engineers, those performing routine analyses, bibliographers, programmers, etc., who are classified as technical staff.

40 Professor, associate professor, lecturer, senior assistant, senior lecturer, teacher, instructor, leading researcher, senior researcher, researcher, junior researcher, other (including administrative staff).

41 PhD students also work as junior researchers.

Area of impact	RDIE Strategy
Social and demographic impacts	<p><b>Research system:</b></p> <ul style="list-style-type: none"> <li>• The new academic career model will make research careers more attractive. Young people are more likely to choose a career in research or engineering. Young talent is more likely to stay in Estonia. More flexible career paths for researchers, and the acquisition and application of diverse knowledge and skills in working life, will increase job satisfaction. It will also make the Estonian research system more attractive to (foreign) talent – keeping our talent in Estonia or attracting talent from abroad to Estonia (high level of R&amp;D and next generation of researchers).</li> <li>• Supporting the next generation of researchers by providing a junior researcher position, social guarantees and secure income for doctoral students will make research careers more attractive and ensure that students complete their doctoral studies, providing the necessary workforce with a PhD/doctoral degree for academia, the private sector and other sectors.</li> <li>• Equal opportunities, including gender balance, are ensured in hiring workforce, allocating grants and in the composition of decision-making bodies.</li> <li>• The Strategy has a direct impact on the development of a knowledge-based society. A high level of scientific excellence and its coherence with the needs of society creates the preconditions for knowledge growth, better quality of education, sustainability of research and higher education carried out in Estonian (language), and more effective and relevant policies.</li> </ul> <p><b>Possible negative effects:</b> Flexible career and professional development opportunities in other sectors can lead to talent moving from the research system to other sectors and professions. To ensure the next generation of researchers, it is necessary to increase the stability of the research system and the job security of researchers by increasing research funding.</p> <p><b>Knowledge transfer:</b></p> <ul style="list-style-type: none"> <li>• Better opportunities for mobility between sectors will ensure professional development and flexible career paths of researchers and entrepreneurs, which will increase job satisfaction and keep our talent in Estonia (high level of R&amp;D and next generation of researchers). Demand for R&amp;D staff in the private sector is expected to increase and more R&amp;D jobs will be created in the private sector as well as in other sectors. In this way, the results of research can be better applied in business, but also in other sectors (better addressing the needs of society, the development of a knowledge-based society). Researchers are highly valued cooperation partners across all sectors.</li> <li>• The focus areas of the Strategy are, inter alia, related to the growth areas of smart specialisation, focusing on promoting knowledge-based economic development and increasing Estonia's international competitive advantage, with the overall impact of increasing the quality of life, well-being and sustainability of Estonian society and people (including better job opportunities and higher employment rate).</li> <li>• The Strategy has a direct positive impact on the development of a knowledge-based society, in particular through increased knowledge transfer capacity, both on the supply side (research system) and the demand side (business environment). This will lead to new and innovative solutions which, on the one hand, address society's needs with fewer resources, and on the other hand, offer opportunities to improve the quality of products and services, and improve the functioning of society, economic competitiveness, sustainable development and overall well-being.</li> </ul> <p><b>Possible negative effects:</b> Increased R&amp;D activity in the private sector could lead to new career and professional development opportunities in other sectors, and to researchers leaving academia, thus putting at risk the presence of the next generation of researchers. To ensure the next generation of researchers, it is necessary to increase the stability of the research system and the job security of researchers by increasing research funding.</p>

Area of impact	RDIE Strategy
<b>Social and demographic impacts</b>	<p><b>Business environment:</b></p> <ul style="list-style-type: none"> <li>• New skills and better capabilities in the business sector – new skills for managers, the application of modern management models and principles of responsible business, better skills for analysing markets, developing products and services, and managing sales and marketing in a comprehensive way when entering international markets. Applying new skills and knowledge will boost the overall competitiveness and productivity of the business sector – a key basis for economic growth.</li> <li>• The overall impacts of structural changes in the economy and economic growth are increased quality of life, increased prosperity and sustainability for Estonian society and people (including better job opportunities and higher employment rate).</li> <li>• In an evolving (start-up) business environment, new forms of entrepreneurship and work are encouraged that make the work environment more attractive to skilled labour, increase labour satisfaction and enable us to retain our talent in Estonia or attract talent from abroad (alleviating the skills shortage).</li> </ul> <p><b>Possible negative effects:</b> Due to structural changes in the economy, the need for simple and routine jobs is decreasing, which increases the need for retraining and further training and leads to higher retraining costs. High levels of productivity will make Estonia more attractive to foreign talent, increasing the need for their integration into society and the need for related services and support systems.</p>
<b>National security and international relations</b>	<ul style="list-style-type: none"> <li>• The Strategy contributes to Estonia's international commitments in the field of RDIE. Continued cooperation with other countries in the field of RDIE, membership of international organisations, partnerships, programmes and infrastructures. The Strategy contributes to Estonia's possible negotiating positions and strategy in the field of RDIE at the EU level.</li> <li>• Activities under the Strategy will have a positive impact on the activities of Estonian enterprises in foreign markets and in the field of exports, on Estonia's foreign economic relations, on the conclusion of agreements with key economic partners, ensuring market access for foreign investment and protecting Estonia's interests. The overall competitiveness and productivity of the business sector – the basis for economic growth – will increase.</li> <li>• R&amp;D activities have a positive impact on the competitiveness of Estonian defence enterprises. Achieving the objectives of the RDIE will create the preconditions for increasing Estonia's defence capabilities through GDP growth.</li> </ul>
<b>Economy</b>	<p><b>Research system:</b></p> <ul style="list-style-type: none"> <li>• The development of research infrastructure services will open up infrastructure for business cooperation, make the infrastructure management model more sustainable and allow enterprises to use Estonian infrastructure for research and development. Enterprises no longer need to buy the services they need from abroad. The availability of the necessary capacity and services in Estonia reduces the additional costs associated with outsourcing for enterprises and contributes to the Estonian economy.</li> <li>• Developing research capacity will create the conditions for preparing a highly educated workforce with up-to-date skills and knowledge and for providing enterprises with the basic and applied knowledge they need.</li> <li>• The Strategy contributes to improving the use of and access to information society services (open science, scientific information systems, databases, etc., open for use by the research community and wider society, including enterprises), which will provide the necessary support for the application of the knowledge and infrastructure created for the benefit of wider society and the economy.</li> <li>• Building the basic capacities of the research system will increase the capacity to transfer knowledge and address the development needs of society, including economic development needs.</li> </ul>

Area of impact	RDIE Strategy
Economy	<p><b>Knowledge transfer:</b></p> <ul style="list-style-type: none"> <li>• The Strategy has a direct and positive impact on the development of a knowledge-based society, in particular through increased knowledge transfer capacity, both on the supply side (research system) and the demand side (business environment). This will lead to new and innovative solutions which, on the one hand, address society's needs with fewer resources, and on the other hand, offer opportunities to improve the quality of products and services, and improve the functioning of society, economic competitiveness, sustainable development and overall well-being.</li> <li>• The Strategy will have a positive impact on innovation (applied research, experimental development, start-ups) and investment in R&amp;D, as well as on business cooperation with R&amp;D institutions and universities. Increasing the R&amp;D capacity of enterprises, innovation, development of new production methods, products and services, research and development, including through the activities of development advisors in the business associations. Enterprises are more actively using R&amp;D, and R&amp;D institutions and universities are more active in leveraging knowledge transfer. It enables us to meet society's needs with a more efficient use of resources, improve the quality of products and services, the functioning of society, the competitiveness of the economy, sustainable development, and overall well-being.</li> <li>• The focus areas of the Strategy are, inter alia, related to the growth areas of smart specialisation, focusing on promoting knowledge-based economic development and increasing Estonia's international competitive advantage, with the overall impact of increasing the quality of life, well-being and sustainability of Estonian society and people.</li> </ul> <p><b>Business environment:</b></p> <ul style="list-style-type: none"> <li>• The actions under the Strategy will have a positive impact on the business environment and the performance of enterprises, including competition and market performance, small and start-up enterprises, investment and innovation. This leads to higher profits, higher paying jobs and increased competitiveness of Estonia in foreign markets.</li> <li>• The capacity of enterprises to raise capital on financial markets increases. The Strategy will have a positive impact on business and private sector investment in R&amp;D, boosting enterprises' international competitiveness. The internationalisation of enterprises is gaining momentum (e.g. business exports are picking up, inward and outward investment is increasing).</li> <li>• The actions foreseen in the Strategy will have a positive impact on creating a business environment that supports innovation, including a favourable tax and regulatory environment, as well as reducing administrative burdens: public services will be offered to enterprises through a single digital gateway, as proactively as possible and in line with their business needs. Providing services through a single digital gateway will reduce fragmentation for enterprises. A lasting and consistent reduction of red tape is ensured for entrepreneurs, including through the implementation of the real-time economy solutions, which will increase their satisfaction with public services and support systems and make the business environment more attractive to foreign talent and investment.</li> <li>• The actions foreseen in the Strategy will have a positive impact on the use of and access to information society services. This will foster automation, including digitalisation, and the use of artificial intelligence and robotics technologies to increase the efficiency of enterprises' supply chains and to add value to products.</li> </ul> <p><b>Possible negative effects:</b></p> <p>Digitalisation and automation of enterprises will lead to the loss of some jobs. The risk will be mitigated by promoting further training and retraining, by introducing new flexible forms of work and through the OSKA system.</p>

Area of impact	RDIE Strategy
<b>Environment</b>	<ul style="list-style-type: none"> <li>• The impact of the Strategy on the living and natural environment is manifested through the activities of research teams and through research in this field: new knowledge is generated about what is happening in the field, serving as the basis for a knowledge-based environmental policy. A higher level of research helps to reduce the negative impacts of higher production volumes on the natural environment. Natural resources can be used more sustainably and their use will generate more added value.</li> <li>• Taking into account the UN's Sustainable Development Goals and the EU's environmental policies, including the European Green Deal and climate neutrality objectives, is one of the key pillars of the Strategy, which will also guide the setting of focus areas for RDIE.</li> <li>• The impacts of the Strategy are related to the consumption of natural resources (including contribution to the valorisation of local resources) and the reduction of ozone-depleting emissions; it will also have a positive impact through the reduction of environmental risks, including the likelihood or magnitude of climate change, preparedness and adaptation to environmental risks (R&amp;D, technology development and innovation in the field).</li> <li>• Enterprises will be encouraged to shift to a low-carbon and circular economy. This will reduce the generation of waste and pollution as well as the pressure on the environment.</li> </ul> <p><b>Possible negative effects:</b> Energy consumption is growing at the same pace as the economy, although more slowly than economic growth. Higher energy consumption can be met by using renewable energy sources or nuclear power, thus minimising the impact on the environment.</p>
<b>Regional development</b>	<ul style="list-style-type: none"> <li>• The regional impact is manifested through the regional location of R&amp;D institutions, higher education institutions and their colleges and through their role as local centres of excellence (also outside Tallinn and Tartu), which reduces inequalities between regions. Being located across different regions enables research institutions, universities and their colleges to cooperate with local enterprises and municipalities, helping to boost local life and regional growth. The regional colleges of universities and institutions of professional higher education, in particular,</li> <li>• have an important role to play in bringing research and innovation to the enterprises operating in the regions and in building the R&amp;D capacity of enterprises in the regions, especially in future-oriented areas that are important for the region (regional business growth areas).</li> <li>• The Strategy supports the economic development and competitiveness of different regions of Estonia. Better job opportunities in business and better access for entrepreneurs to services outside the larger centres. In developing the business environment, regional specificities will be taken into account where appropriate, providing support for start-ups and the development of regional enterprises, supporting the operation and development of a regional business support system, as well as ensuring access to financing opportunities for business development outside the larger centres. In cooperation with local authorities, a competitive and flexible investment environment will be developed in regions, including by ensuring access to finance and a suitable tax and regulatory environment. This will reduce inequalities between regions and promote local life and economic growth.</li> <li>• The Strategy will have an impact on the activities of Estonian enterprises in foreign markets, facilitating entry into international markets and growth and expansion in existing and new export markets, thus increasing coherence with the development of the EU internal market and the EU as a region.</li> <li>• It will also affect Estonia's overall competitiveness through regional cooperation with the rest of Europe (international cooperation in the field of RDIE).</li> </ul> <p><b>Possible negative effects:</b> As research is mainly carried out in larger centres (Tartu, Tallinn) due to the location of research institutions and universities, some regional differences will persist and possibly increase. Although research funding is mainly concentrated in cities with large R&amp;D institutions and universities, its beneficial effects also reach other regions as a spill-over effect.</p>

Area of impact	RDIE Strategy
<b>Functions and organisation of state and local authorities</b>	<ul style="list-style-type: none"> <li>• The impact will be felt through the potential cooperation of research institutions, universities and their colleges as well as enterprises with local authorities. This will increase the capacity and role of local authorities (as valued and capable partners for enterprises and R&amp;D institutions, as contracting authorities for RDI) and support the promotion of local life and address the development needs of regions.</li> <li>• The R&amp;D capacity of ministries will be strengthened and sectoral R&amp;D organisation and coordination will be improved, including through the activities of research advisers in ministries. The role of the government as a contracting authority and initiator of RDI will increase – the government will steer the development of RDI in different areas. This will have a positive impact on knowledge-based policymaking and on addressing, in partnership between the research system and the business sector, the development needs of Estonian society as a whole.</li> <li>• An Innovation Agency will be established to ensure higher quality and accessibility of services for entrepreneurs (the tasks of the agency will be carried out by Enterprise Estonia, within the scope of the MoEAC). This, in turn, will support and enhance the performance of enterprises, including increasing RDI intensity and added value.</li> <li>• A competitive and flexible investment environment will be developed in regions in cooperation with county development centres and local authorities (local partners in designing and implementing innovation and entrepreneurship policies). This will reduce regional disparities and inequalities, increase cohesion and create better conditions for the growth of overall prosperity in all regions of Estonia.</li> <li>• Increasing private sector investment in R&amp;D in the second half of the period will reduce the pressure and the burden on public finances.</li> <li>• The introduction of event-driven services and the digital gateway will require greater cooperation between public authorities and local governments, leading to higher and more harmonised levels of public service provision and management.</li> </ul>

# Annex 6. The contribution of the Strategy to UN Sustainable Development Goals (SDGs)

RDIE contribution	UN Sustainable Development Goals	RDIE contribution to the goal
<b>Direct RDIE contribution</b>	<b>Goal 4.</b> Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The research system axis: coherence between research and higher education ensures high quality of higher education and training of the workforce
	<b>Goal 7.</b> Ensure access to affordable, reliable, sustainable and modern energy for all	The research system, knowledge transfer, business environment axes: contributing to improving access to research and technology in the field of renewable and clean energy.
	<b>Goal 8.</b> Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all <b>Indicators:</b> real GDP growth, resource productivity, labour productivity	The business environment and knowledge transfer axes in particular, but also the research system axis: sustaining economic growth, productivity growth (technology upgrading, innovation, higher added value), entrepreneurship and innovation. Supporting the activities of micro, small and medium-sized enterprises, access to financial services. Resource efficiency in consumption and production
	<b>Goal 9.</b> Build resilient infrastructure, promote sustainable industrialization and foster innovation <b>Indicators:</b> R&D expenditure, employment in R&D activities	The research system, knowledge transfer, business environment axes: boosting innovation and R&D, increasing R&D spending and staff. High quality and accessible research infrastructure. Promoting an inclusive and sustainable industry. Use of environmentally friendly technologies. Improving access to information and communication technologies, including the development of the ICT sector
	<b>Goal 11.</b> Make cities inclusive, safe, resilient and sustainable	The research system, knowledge transfer, business environment axes: RDI contribution to e.g. waste management, climate change adaptation, resource efficiency, smart regional planning
	<b>Goal 12.</b> Ensure sustainable consumption and production patterns	The knowledge transfer and business environment axes in particular, but also the research system axis: sustainable management and efficient use of natural resources. Valorisation of resources. Waste reduction, recycling and recovery
	<b>Goal 13.</b> Take urgent action to combat climate change and its impacts	The research system, knowledge transfer, business environment axes: more environmentally friendly production models for enterprises and reduction of production emissions (supporting the transition to a low-carbon and circular economy). The causes of climate change and the adaptation processes of the natural environment need to be better understood (research).
	<b>Goal 17.</b> Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	The research system, knowledge transfer, business environment axes: international cooperation in the field of RDIE, development of green technologies, promotion of ICT use, knowledge transfer. External trade relations. Joint public-private and civil society activities: cooperation between actors in the RDIE system

RDIE contribution	UN Sustainable Development Goals	RDIE contribution to the goal
<b>RDIE's (potential) contribution in a specific area</b>	<p><b>Goal 2.</b> End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p> <p><b>Goal 3.</b> Ensure healthy lives and promote well-being for all age groups</p> <p><b>Goal 6.</b> Ensure availability and sustainable management of water and sanitation for all</p> <p><b>Goal 14.</b> Conserve and sustainably use the oceans, sea and marine resources for sustainable development</p> <p><b>Goal 15.</b> Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p> <p><b>Goal 18.</b> Viability of the Estonian cultural space</p>	<p>The research system, knowledge transfer, business environment axes: products and services, market access, productivity growth, research and development, knowledge transfer, innovation and technological development in a specific sector or field (e.g. agriculture, health, natural environment, the Estonian language and culture, etc.).</p>
<b>More indirect impacts of RDIE</b>	<p><b>Goal 1.</b> End poverty in all its forms everywhere</p> <p><b>Goal 5.</b> Achieve gender equality and empower all women and girls</p> <p><b>Goal 10.</b> Reduce inequality within and among countries</p> <p><b>Goal 16.</b> Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>	<p>The research system, knowledge transfer, business environment axes: overall economic growth and growth in prosperity and the development of a knowledge-based society contributing to the Sustainable Development Goals</p>



# Annex 7. Other documents related to the implementation of the Strategy

**RDIE focus area fact-sheets** The focus area fact-sheets describe in more detail the content of each focus area, its objectives, expected results and indicators. The focus area factsheets will be updated according to how the thematic objectives, expected results and indicators are set out in the decisions of the RDIE Steering Committee, and how narrower thematic areas (niches) and action plans are defined in cooperation with the research community, enterprises and policy makers through bottom-up participatory processes.

**National Research Infrastructure Roadmap**<sup>42</sup>. The Estonian Research Infrastructure Roadmap contains a list of new or upgraded research infrastructure objects of national importance. The Roadmap is a long-term planning tool with a 10-20 year perspective. The Roadmap is regularly updated (every 3-4 years) to reflect the changing needs and opportunities. The latest roadmap was approved by the Government of the Republic in 2019.

**Strategic framework for participation in EU partnerships**<sup>43</sup>. The draft Strategic Framework for Participation in EU Partnerships was approved by the Government of the Republic in 2015. The purpose of the participation plan is to define the principles of Estonia's participation in EU partnerships, to describe the decision-making process for choosing the partners and the division of roles between them.

**Principles of Open Science** (forthcoming). Open science means free access to electronic scientific information, in particular publications and scientific data created and published using public funds. The open science principles are approved in five areas: 1) access to scientific publications; 2) open scientific data; 3) communication and skills related to open science; 4) infrastructure; and 5) evaluation of research. In addition, a governance and coordination scheme for open science is formulated.

**Action Plan for High-Performance Computing in Estonia** (forthcoming). High-performance computing (HPC) and data processing are important in almost every field of science today, forming the third pillar of science alongside experimentation and theory. Ensuring and developing HPC capabilities is strategically important for Estonia's R&D, ICT and other high-tech enterprises. The Action Plan sets out a future vision and actions for HPC.

**Estonian Science Communication Strategy 2020–2035 'Estonia knows'**<sup>44</sup>. The Science Communication Strategy supports the achievement of the objectives of the 'Estonia 2035 Strategy', the Research, Development, Innovation and Entrepreneurship Strategy 2035 and the Education, Youth and Languages Strategies, and serves as an input to planning measures for the European Union programming period 2021-2027.

**Principles for the internationalisation of higher education and research up to 2035** (forthcoming). Internationalisation and international competition in higher education and research remain key themes in the new Education Strategy and in the Research, Development, Innovation and Entrepreneurship Strategy until 2035. The higher education and research area is increasingly open, and internationalisation has become one of the most important factors influencing higher education and research policies. In the context of the new strategic period, the aim of the document is to set out the principles for the internationalisation of both higher education and research to support the implementation of the education and research strategies.

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**Vision for the Real-time Economy 2020-2027**<sup>45</sup>. The Vision for the Real-time Economy aims to bring about structural change in the way enterprises are managed and run by improving data quality and applying digital technologies, including artificial intelligence and blockchain technologies to automate operations. Activities are based on the life cycle of a enterprise and contribute to the development of the business environment.

**Action Plan for the Involvement of Foreign Professional 2017+**<sup>46</sup>. The main objective of the Action Plan for the Involvement of Foreign Professionals is to increase Estonia's attractiveness as a place to work and live, to make Estonia a place where the people that Estonia needs – both foreign nationals and Estonians living abroad – are interested in coming to work, to make it easy to recruit and employ them, and to create suitable working and living conditions for them.

**Estonian Space Programme 2020-2027**. The aim of the Estonian Space Programme is to enable the development of technology-based entrepreneurship in Estonia and, as a result, to increase export of products and services, and to develop education and research. It is important to improve the position of Estonian enterprises in supply chains and to contribute to the emergence of main contractors in Estonia.

**The Tourism Programme** (forthcoming). The Tourism Programme sets out a tourism policy that takes into account Estonia's preconditions, circumstances and needs, and contributes to Estonia's sustainability and the well-being of its citizens through increased exports and added value of tourism services. The programme defines the strategic objectives of the tourism sector and the priority actions to achieve those objectives.

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