

## 1. Programme strategy: main development challenges and policy responses

### Smarter Estonia

#### Providing preconditions for smart growth and entrepreneurship

**In 2019, labour productivity was 78.8% of EU average** and the 2020 goal (80%) remains unfulfilled. Based on 2017 data, the manufacturing sector constitutes 19% of jobs and 15.7% of GDP, while the productivity in that sector is merely 50% of the EU average. This implies a low position in the international value chain and mostly non-knowledge-intensive work in this sector. A similar gap with the EU average is seen in the IT and communications sectors. The number of start-ups and the ability to raise investments has increased, but **university-business cooperation remains low**. Small percentage of **companies invest in research and development** (286 companies in 2019) and the sums invested are not large - a total of 246.8 million euros in 2019 (0.88% from GDP). **The main reasons why companies are not investing in development have to do with risk aversion, long return periods and a general lack of interest**. Estonian private sector's relative research and development expenditure (0.88% of GDP in 2019) lags behind the EU average and there is little cooperation between businesses and research institutions. In the private sector, the number of research and development workers is low compared to EU average (in 2018, EU average per 1000 employers 6,3, in Estonia 3,4). The valorisation of local resources such as wood, food, minerals, secondary raw materials is limited, the resources are often exported with the low value added and on a low levels of value chain. While Estonia retains a leading position in Europe in terms of digital public services, **the integration of digital technologies in private sector is lacking (20th position in the EU)**. **Productivity can be improved by well-planned investment subsidies** to small and medium enterprises, in order to reduce risk and remove barriers to climbing the global value chain. **Support for digital technologies and automation can help cope with increasing labour shortage**. In order to increase private sector research and development and promote cooperation, **high export-potential companies should be provided with support in areas from prototyping to product development**. Due to lack of cooperation between private sector and research institutions, it makes sense to support mobility among researchers and companies' product development teams. Furthermore, research and development could be supported by providing companies with access to scientific information, research data and results as well as research infrastructure to use in business development. Competing abroad requires a strong external network, in order to help Estonian companies gain ground on new markets. Furthermore, **various training opportunities should be provided** to improve companies' competitiveness. In order to create a credible and sustainable (climate neutral) consumer image, **attitudes should be shaped** via training and outreach. Since entrepreneurship and starting up a business can be difficult outside larger cities (lack of capital and labour), **new and established regional enterprises should be advised** and activities should be conducted to increase entrepreneurial awareness, e.g. by supporting start-ups. Innovative start-ups need to be agile to quickly grow and test their ideas, so start-ups need seed investment. This development need is tied to the 2019 country-specific Council recommendation number 3, particularly the proposal to foster research and innovation while taking into account regional differences. Investments in research and innovation increase productivity and enable local manufacturers to climb the value chain.

In addition, boosting private sector innovation and R&D requires a **relevant and flexible RD&I supply**, including competent researchers and top-level research teams in the fields matching with the current and future needs of the private sector. Despite the high level of Estonian research quality, there is a gap between research system and the needs of the economy and society. There is a need to **reach out the R&D knowledge and services and to extend the research capacities** towards the needs of the business sector and society at large. Securing RD&I supply needs to be achieved by involving different players (R&D and higher education institutions, companies and business associations, ministries and public sector institutions, etc) and actions, and focus on increasing the attractiveness, competitiveness and sustainability of the research system and diversification of the applied research areas, supporting capacity of transferring technologies, developing skills and services to commercialise research results, and developing the capacity of research and higher education institutions to improve the commercial viability and market relevance of their research projects as well as ‘profile’ R&D, making it better adapted to innovation and the production of human capital to meet national needs.

According to reports and assessment, **weaknesses in the RD&I governance, coordination and innovation ecosystems** are also considered a challenge. It is necessary to create synergy and increase efficient cooperation and coordination between the ministries, implementation agencies, research institutions, enterprises and other participants, including via entrepreneurial discovery processes. There is a need to **increase the public sector’s RD&I capacity**, the capacity to integrate RD&I into the national policies and to set the demand for RD&I together with a supporting environment for it. More attention should be paid to building the **networks and cooperation platforms** for the participants of the Estonian ‘innovation system’ and to strengthening business-academia connections. The national **smart specialisation governance system** as an important part of the RD&I governance and innovation ecosystems will be re-designed and integrated into the **governance system of the national RDI and entrepreneurship strategy**.

## For the Investment for Jobs and Growth goal:

Table 1		
Policy objective	Specific objective or dedicated priority*	Justification (summary)
PO1	i) enhancing research and innovation capacities and the uptake of advanced technologies;	<p>The interventions focus on increasing the use and effect of the RD&amp;I results and spreading innovation further in the society contributing to the development of the national smart specialisation areas. The following challenges will be addressed within three directions:</p> <ol style="list-style-type: none"> <li>1. Private sector's innovation capacity and RD&amp;I demand <ul style="list-style-type: none"> <li>- The capacity of Estonian businesses to adapt and introduce new knowledge and technologies is currently inadequate.</li> <li>- Estonian innovation system capacities and performance are still inadequate to develop and activate absorptive capacity and therefore the R&amp;D function in companies. Estonian companies are small and there are few companies engaged in research and development, the research development institutions capabilities and capacity for innovation are limited.</li> <li>- Companies and public sector lack people with skills and experience in RD&amp;I and product development.</li> <li>- The level of productivity and the position of Estonian companies in global value chains is too low.</li> </ul> </li> <li>2. Ensuring relevant and flexible RD&amp;I supply <ul style="list-style-type: none"> <li>- R&amp;D and higher education institutions' capacity to serve the demand driven needs of the society and businesses is low, including in terms of the quality of knowledge transfer services.</li> <li>- Societal challenges linked to UN sustainable development goals and smart specialization should be better integrated into the Estonian RD&amp;I system. There are very few thematically focused RD&amp;I activities where R&amp;D and higher education institutions and businesses work together to build advantages within the emerging new markets and technologies.</li> <li>- There is a gap between top-level research capacities, the needs of the society and structure of economy. The use and availability of research infrastructure services and research outputs of the centres of excellence outside the academia is limited.</li> </ul> </li> <li>3. Well-functioning knowledge transfer system <ul style="list-style-type: none"> <li>- The interaction and connections between academia, private and public sector are limited, local 'knowledge networks' and cooperation platforms are underdeveloped, the potential of engagement in international 'knowledge market' has not been fulfilled.</li> <li>- Public sector's capacity to integrate RD&amp;I into the national policies, including the government's important role as a forerunner in applying innovative solutions and as the creator of the demand for innovation, is limited.</li> <li>- The availability and awareness of research data and outputs is modest, civil society and businesses engagement in RD&amp;I processes is limited.</li> </ul> </li> </ol> <p><b>Impact of these interventions:</b></p> <ul style="list-style-type: none"> <li>- increasing the capacity of research and development will improve the quality and extent of the R&amp;D services, increase the uptake of new technologies, business and service models leading to improved value chain, higher productivity and more efficient and effective products and services;</li> <li>- strengthening innovation performance and fostering productivity growth will increase sustainability, growth and overall well-being of the Estonian society, for every citizen through improved products and services, higher incomes and sustainable and greener environment.</li> </ul>

## 2.1 Smarter Estonia

### 2.1.1. Specific objective

**(i) enhancing research and innovation capacities and the uptake of advanced technologies.**

#### Interventions of the Funds

#### The related types of actions

The overall intervention logic follows a systematic approach based on the CR Annex D, country-specific recommendations of the European Semester investment guidelines and international peer review of the Estonian RD&I system. It is supporting the implementation of the new national Research, Development, Innovation and Entrepreneurship strategy for the period of 2021-2035.

The interventions focus on increasing the use and effect of the RD&I results and spreading innovation further in the society in consistence with the smart specialisation areas. The intervention logic involves three directions:

1. expanding private sector's innovation capacity and RD&I demand;
2. securing relevant and flexible RD&I supply for the private sector;
3. bridging the demand and supply side by the knowledge transfer mechanisms.

1. Supporting the capability and motivation of the business sector to invest in RD&I

The interventions include the support for increasing the RD&I role in the companies' business models and by developing company management culture that promotes innovation, raising the companies' awareness about the benefits and possibilities of RD&I activities (e.g. by counselling, consultations, study visits, shadowing, mentoring, etc.); capacity building activities and support for the staff, including attracting of (foreign) top-level specialists. An applied research and experimental development programme will be implemented based on the needs of the companies (R&D activities that can be applied in business). The interventions also involve support for investments with higher added value and based on RD&I capability (development centres, expanding the existing investments to development activities, start-ups), by offering R&D shares and using the potential of technology development centres; promoting and supporting companies involvement in international R&D programmes, partnerships, networks (e.g. network of DIH centres and EDIH network), organisations (e.g. CERN, ESA, EUROSTARS, etc.) and value chains in strategic common interest; support for scaling the technologies developed in Estonia (including the uptake of near-market solutions for green technologies and innovation allowing to follow the European Green Deal and transfer to a low carbon and circular economy) to international markets and endorsement of investments that support companies in the transferring process. Also, activities strengthening the role of the state as the active user of R&D activities and forerunner of innovation demand will be supported, including innovative public procurements, public sector-driven developmental activities for companies, design of public services, partnership between public and private sector, demo projects and the infrastructure and information technological solutions necessary for all this.

2. Relevant and flexible RD&I supply for addressing demand driven societal and business needs

- 2.1. Supporting the development of research-based services and institutional knowledge transfer capacity, including commercialization capacities of R&D and higher education institutions (ASTRA+)

The interventions involve a complex and flexible 'work package' for the R&D and higher education institutions to increase their capacity and skills to engage in business-university cooperation and to improve the accessibility to research results. The interventions will support the development and implementation of 'entrepreneurial' model for the institutions, including the development of research-based services, the increase of competences of the academic and administrative staff in the area of knowledge transfer processes, including the commercialization of research results (i.e. study trips, traineeships at the top level research commercialization institutions and RTOs of the top international universities), the development of efficient research and knowledge transfer management system and services, institutional changes to enhance cooperation with businesses (e.g. open and flexible academic career model to support researchers' movement between the sectors) and joint activities between the R&D and higher education institutions (e.g. joint development of services), etc. The interventions will also involve the development of user-

friendly formats to improve access to the research results and data to potential users following the principles of Open Science. This complementary support to increasing the visibility and availability of research data and research results for the business sector and other potential users will further increase the impact and unveil the full potential of knowledge transfer activities at the R&D and higher education institutions. Activities include the development of national repositories and Open Science systems and linking them with European Open Science Cloud (EOSC) as well as the development of user portal of the research information system ETIS to increase the visibility and access to the research activities and outputs.

## 2.2. Implementing thematical R&D programmes to promote the co-creation and cooperation of the academic, private and public sector within smart specialisation areas

The activities focus on building critical mass of the researchers and research capacity within the smart specialisation areas where clear economic or social potential has been identified, but where the capacity to address specific research topics and providing market-oriented research solutions are not sufficient to satisfy the entrepreneurial demand. R&D activities, national and international cooperation (including participation in EU partnerships), preparing (future) RD&I specialists/young researchers and developers, who could take up RD activities in companies, attracting top-level researchers, the commercialisation and communication of research results and other activities necessary for the development of the focus areas will be supported within these programmes. Entrepreneurial discovery process and co-creation are the strong basis of these programmes.

## 2.3. Offering top-level knowledge and research infrastructure services for the benefit of demand driven needs of society and businesses

The focus of interventions will shift from the top-level research capacity building towards promoting collaboration and service provision to public and private sector. The interventions involve two important directions for the action: 1) making the research output and activities of the research centres of excellence available and usable for addressing demand driven needs of the private and public sector in Estonia and 2) opening the research infrastructure for private and public use. The interventions are designed to deliver significant economic and societal impact via linking frontier research with needs of business sector and society in consistence with smart specialisation activities. The supported activities include transfer of knowledge and technology through licences, expertise and know-how to companies, preparing new generation of (future) R&D specialists oriented towards business sector, research activities based on business sector needs and potential, engaging businesses and civil society in interactive RD&I processes to enforce informed exploitation of research outputs, etc. The interventions regarding the research infrastructure involve support for developing market-relevant R&D services for the private and public sector based on the existing infrastructure.

## 3. Knowledge transfer mechanisms, including more active role of the public sector in the knowledge transfer process

### 3.1. Building the 'knowledge networks' and business-academia links through the movement of employees between the academic, private and public sector

The interventions involve supporting movement of different types of employees between the academia, private and public sector, including support for short- and longer-term mobility of researchers and other RD&I experts, for implementation of entrepreneurial PhD programmes (involving PhD students in the business sector), promoting entrepreneurial professorships, cooperation and networking platforms and match-making activities, etc.

### 3.2. Support for the internationalisation of R&D: connecting to the international knowledge market

The interventions involve support for research institutions and enterprises to participate in international R&D networks to be linked with the state of the art research and technology in the field and to be able to offer high-level expertise in solving R&D tasks. The activities include supporting participation in EU programmes, partnerships and projects, incl. European Horizon 2020, supporting necessary preparations for international research projects and establishing consortia; support for the international research marketing activities, research mobility, attracting top-level (future) researchers and specialists to Estonia, support for ERA chairs, Seal of Excellence projects, etc.

### 3.3. Strengthening the RD&I absorption capacity in the society and building RD&I-favourable policy environment

The interventions help to increase public demand for RD&I and develop tools and methods to better integrate RD&I into the national policies. There is a growing need to use new solutions for solving societal challenges or development needs as described in "Eesti 2035" strategy and national RDI and entrepreneurship strategy. Therewith, we emphasize interdisciplinarity, e.g. besides most up-to-date technologies also cultural and creative competences is a valuable innovation resource that should be not omitted.

Support will be provided for development of tools and methods for R&D&I in public sector, for example development of guidelines and concepts, development of toolboxes with pretested instruments and case-studies, organization of events and trainings, networking and knowledge sharing, building interministerial task forces, innovation units.

Funding for research and development projects, experiments, development of prototypes and new solutions and other innovation projects as well as feasibility studies and analyses supporting implementation of focus areas of Estonian smart specialization strategy (as defined in national RDI and entrepreneurship strategy). Also, improvement of service design and using R&D&I for it will be supported. All the projects will be well communicated and used as case samples to popularise public sector innovation.

### **The main target groups**

Both new and existing companies, who are interested in developing knowledge and technology intensive business models; who already are active in RDI activities, but need additional resources and knowledge to reach the aims; who are currently not yet working on improving their economic results with the help of applied research and experimental development; who have the potential to increase the volume of R&D activities carried out for their business purpose; exporting companies with ambition and capability to rise in the global value chains; energy-intensive industries who contribute considerably into reaching the aim of climate neutrality. R&D institutions, higher education institutions, researchers, research teams, PhD students/young researchers, academic and supportive staff, knowledge transfer units at the R&D and higher education institutions, businesses and private sector's associations, ministries and other public sector bodies involved in RDI, centres of excellence, owners of the research infrastructures.

### **Actions safeguarding equality, inclusion and non-discrimination**

In the preparation and implementation of interventions, the possible impact on equality, inclusion and non-discrimination will be taken into account and safeguarding actions taken where relevant. No special measures are planned in the field of RD, in order to support specific groups (e.g. targeted measures and activities based on gender). However, the actions will involve the following: requirements and conditions for the applicants will ensure non-discriminative access, gender balance will be taken into account in composition of the committees and selection bodies, non-discriminative principles and procedures for evaluation and selection will be established.

### **Indication of the specific territories targeted, including the planned use of territorial tools**

Across Estonia

### **The interregional, cross-border and transnational actions**

The interregional and transnational actions will be mainly covered by two interventions:

- Implementing thematical R&D programmes to promote the co-creation and cooperation of the academic, private and public sector within smart specialisation areas, where among other activities international networking and involvement in projects, programmes and partnership (including EU partnerships) necessary for the development of the focus areas are supported.

- Support for the internationalisation of R&D: connecting to the international knowledge market is fully dedicated to international cooperation activities, including participation in international RD&I networks, partnerships, EIT KIC-s, joint programmes, European Horizon 2020, support for Seal of Excellence projects, ERA chairs, etc.

However, the element of international cooperation activities is also involved in other interventions, e.g.

- Supporting the increase of the research impact and institutional knowledge transfer capacity of R&D and higher education institutions (ASTRA+), where among other activities involvement in international knowledge transfer and cooperation networks, study visits and gaining professional experience at top-level knowledge transfer centres abroad, etc is supported.

- Offering top-level knowledge and research infrastructure services for the benefit of demand driven needs of society and businesses, where among other activities involvement in international (innovation and knowledge transfer) networks and activities is supported.

## **The planned use of financial instruments**

*N/A*

### **2.1.5. Indicators**

*TBC*