## Activities of the state in promoting key areas of research and development

*How has Estonia carried out the national research and development programmes foreseen in the Estonian Research and Development and Innovation Strategy 2007-2013 "Knowledge-based Estonia"?*

Report of the National Audit Office to the *Riigikogu,* Tallinn, 7 March 2012

### Summary of audit results

The National Audit Office evaluated whether national research and development programmes and the other related financing measures allow the state to steer the development of the areas of research that are important for Estonia (biotechnology, energy technology, materials technology, environmental protection and technology, health, information and communication technology) and whether they contribute to the achievement of the state's research and development priorities. According to Statistics Estonia, 232.76 million euros (3.64 billion kroons) was spent on research and development in Estonia in 2010, which comprised 1.63% of the gross domestic product. 102.76 million euros was allocated to research and development from the state budget. These costs are probably bigger, but there is no adequate overview of how much money has been allocated to research and development from the state budget.

The goal that the state of Estonia has set itself is to promote the competitiveness of its economy and guarantee sustainable development. This requires Estonia to transfer to knowledge-based economy. i.e. contribute more into research and development, and the education and skills of the workforce. The purpose of research and development is to promote the creation of products and services of higher added value in both the private and public sectors.

Estonia has considerably increased the amounts of money allocated to research and development in recent years, which means that we are increasingly more often 'in the picture' in world science. This is evidenced by the number of publications, which has grown year on year, as well as the success of Estonian researchers in applying for funds from the EU framework programme. However, whilst Estonia has achieved considerable international success, national interests have been left in the background, and Estonia has failed to successfully launch the promotion of key areas of research and development (i.e. information and communication technologies, biotechnologies, material technologies, health care, environmental protection and energy technology) or make research comply specifically with the needs of Estonia. The state has not created the prerequisites for assessing its performance in this area.

- A number of measures aimed at supporting research and development were launched before the interests of the state were focused, which is why the purpose of the support may not always be clear and the money may not be used efficiently and effectively. Broad definition of priorities without specific focus may be helpful in ensuring that the money will be spent on time but broad priorities may occur unaffordable to the state in longer term. 45% of the projects financed by the Estonian Science Fund in 2011 and as many as two-thirds of all areas of targeted financing already fall into the key areas. At the same time, about one-fifth of Estonian researchers with a PhD degree work in these key areas.
- The launch of national research and development programmes was delayed for years, which is why there is less time for their completion than initially planned. Piling up the costs to the end of the financing period may lead to rushing and overburdening researchers with work, which in its turn means that the focus will be on ensuring that all money is spent rather than on the creation of new knowledge and added value.

- The role and objective of existing and future national programmes as measures or financing mechanisms are unclear. The state has not yet been able to take full advantage of them in steering research and development. It is also unclear what activities of the state these national programmes actually cover, or should cover.
- The cooperation between ministers in the development and coordination of national programmes has been inadequate. The role and responsibility of ministries in carrying out programmes are sometimes unclear.
- Evaluation of the results of research and development is not given enough attention when money is distributed. Objectives and indicators are too general, and there are also indicators for which no information is gathered. It is not always possible to create links between the activities supported by the state and the expected results. The initial level in respect of which any progress could be measured has not been determined for several measurable indicators. The auditees claim that it is too early to evaluate the impact of the state's activities on the development of key areas, but they haven't even created the prerequisites required for evaluating the impact of their activities in the future and adding up the funds that were spent.
- The main indicators given in the Estonian Research and Development and Innovation Strategy 2007-2013 "Knowledge-based Estonia" (share of research and development expenses in GDP, share of sales revenue generated by new products and services, use of employees in high-tech and medium-high-tech sectors, and the increase in the productivity of companies) will probably not be met by 2013 if the current development continues. The target levels will probably be achieved regarding the share of researchers and engineers, patents, and the share of the innovation investments of companies. The anticipated number of publications has already been exceeded.

**The National Audit Office's main recommendations to the Minister of Education and Research and the Minister of Economic Affairs and Communications are as follows:**

- More specific goals should be formulated for national programmes (in key areas of research and development) in cooperation with other ministries when the new research and development strategy is prepared and presented to the Estonian Government to clarify the specific interests of Estonia in these area and to make sure that the achievement of the goals could be evaluated. If the state decides to give preference to the development of certain areas, there must be clear reasons and goals for doing so, and it should be possible to evaluate the achievement of these.
  Programmes should contain only such activities of the state that are actually planned to carry out and for which the funds were allocated.
- All ministries dealing with the relevant topics should be involved in the development and implementation of national programmes officially and in a timely manner, and the role and responsibility of the ministries that share the responsibility must be clearly outlined in the national programmes.
- Financing national programmes should be guaranteed in such a manner that the money would not be spent mainly on co-financing existing research subjects, but on approaching new areas of research.
- Excessive fragmentation of the activities between measures and programmes should be avoided. Reducing the number of measures and programmes should be considered in the EU budget period that starts in 2014.
- Systematic reporting about the activities carried out in key areas, the achieved results and the money spent should be guaranteed in order to make it possible to evaluate the achievement of the goals set for the key areas of research and development and their cost.

The **auditees** agreed with most of the suggestions made by the National Audit Office, though added several explanatory comments. Both the Ministry of Education and Research and the Ministry of Economic Affairs and Communications admitted that they have encountered difficulties in promoting the state's key areas and launching national programmes, which were largely caused by the cooperation problems of the ministries, but the planned activities have by now been launched.

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