Challenges

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Germany can look back on important successes in ist research and innovation policy (R&I policy). For example, since 2005 there have been considerable improvements in the areas of public and private R&D expenditure, in the positioning of German tertiary education and research institutions in terms of attractiveness and excellence, and in the modernisation of the German economy.

These developments are also due to the fact that R&I policy has enjoyed a high level of attention over the last ten years and that considerable resources have been directed into the fields of science, research and innovation. Germany is now significantly closer to its aim of playing a leading role as an innovation location.

At the same time, Roman Herzog's statement still applies: "The world is moving fast; it won't wait for Germany."[1] The challenges have further increased over the past few years. German R&I policy must be further developed consistently if it is to make a contribution to addressing these challenges. The Commission of Experts considers the following developments to be especially important:

Climate change and sustainability

An international convention on climate protection has been reached with the Paris Agreement. Now, top priority must be given to implementing the agreement. Research and innovation can make an essential contribution to reaching the climate targets. The policy goal of decarbonising the economy must therefore also play an important role in the deliberations of the R&I policy-makers and form an integral part of the new Federal Government's science and innovation strategy.

Demographic development

The ageing of society is creating considerable problems for social security systems. It is also aggravating the lack of skilled labour. Research and innovation can provide solutions for an increasingly ageing population in order to secure quality of life into old age and make longer participation in working life possible.

Equitable participation

R&I policy, too, is confronted with the question of whether innovation processes increasingly generate inequality. Especially in the course of the digital revolution, profound changes are to be expected which, from the citizens' point of view, involve the risk of losing jobs or prosperity. Unless the population is suitably incorporated in decision-making and able to participate equitably, science and innovation might also face growing scepticism.

Energy supply

R&I policy will play an important role in designing the future energy supply. For example, dependence on non-renewable energies must be further reduced. The aim must be to find an economically sensible path towards the almost exclusive use of renewable energy.

Mobility

In the mobility sector, a profound change is taking place from a strong focus on automobiles to multimodal systems of mobility services. The automotive

sector is particularly important to the economy in Germany. The introduction of electromobility, accelerated digitisation, and the emergence of new competitors has put industry under considerable pressure. Innovations are necessary to maintain and expand the competitive position of German companies.

Digital change

Germany is not yet properly prepared for digital change. Funding schemes still do not yet sufficiently take information and communication technologies into account. R&I policy must focus more on start-ups as new innovative players. In addition to assisting and supporting established economic sectors with digital change, the development of new strengths must also be promoted. Training in the competent use of digital applications and responsible handling of personal data will play a key role.

European Research Area

R&I policy must continue to attach great importance to the further development of the European Research Area. The continuation of cooperation with the UK must be secured after Brexit, above all in the field of student and academic exchange.

New innovation pathways

Innovation processes are changing. Increasingly, basic research is leading directly to application and translation possibilities. Start-ups have become key economic players in some areas. New forms of organisation, such as crowd concepts, competition formats and real-life laboratories, are growing alongside traditional, hierarchically organised R&I processes. R&I policy in Germany should do more to embrace these new developments.

Agile state

At present, technological and economic opportunities and the political environment are changing at high speed. German R&I policy needs to be highly flexible to be able to respond quickly to these developments. The modification of structures and processes as a result of digitisation and the launch of innovation processes cannot and should not be excluded from ministries or the public administration. An agile government will be needed in the future.

Targets for the year 2025

It will be impossible to adequately meet the above (and further) challenges without a further strengthening of science, research and innovation. The Commission of Experts recommends that German research and innovation policy should formulate clear targets as a basis for measuring and evaluating further progress. In particular, the Commission makes the following proposals to the Federal Government:

Spend 3.5 percent of GDP on R&D

Private and public engagement in the field of research and development should continue to grow up to 2025. It would be a visible sign of such engagement if the Federal Republic of Germany were to reach the 3.5 percent target by 2025. National R&D intensity is currently close to 3.0 percent.

Establish at least three German universities among the world's 30 leaders

Federal and Länder governments should specifically promote German universities and other tertiary education institutions in order to sustainably improve the international image and standing of Germany's science system abroad. A visible expression of such a development would be for three or more German tertiary education institutions to be among the leading 30 universities in the Times Higher Education Ranking by 2025. Only one German university is currently among the world's 30 leading tertiary education institutions.

Double venture capital's share of gross domestic product to 0.06 percent

By 2025, venture capital should make up more than 0.06 percent of GDP – i.e. more than double the present figure (0.027 percent).

Catch up with the five leading nations in the field of digital infrastructure

The Federal Republic of Germany should strive to have one of the world's leading broadband infrastructures by 2025. R&I policy should begin by abandoning the pursuit of a static goal and agreeing on a flexible, dynamically adjusting target. It would be a visible sign of a positive development if Germany became one of the five OECD nations with a leading digital infrastructure by 2025. Compared to other countries, Germany is currently lagging behind according to almost all indicators of high-performance broadband development faster than 50 Mbit/s.

Double the share of funding in the field of digitisation

The Federal Government must also respond to the challenge of digitisation with a sustainable increase in research funding and technology transfer in this area. Its aim should be to sustainably develop new scientific, technical and economic strengths in order to be among the world's leading economies in this field by 2025. The Federal Government's share of funding in the field of digitisation flow should be rapidly doubled.

Take on a pioneering role in e-government

In e-government, Germany should be recognised in Europe as a successful model of digital government and administration by 2025. Hesitant positioning on the part of German R&I policy is no longer the way forward – the challenges are too big for that. The successes achieved up to now should encourage German R&I policy to believe it can achieve major changes if it sets itself ambitious targets.