

A 1 Central guidelines for R&I policy in the new legislative period

R&I policy has shown a positive dynamic in recent years. Against the background of the delayed formation of the government, the future Federal Government should follow this up swiftly and resolutely develop German R&I policy further. In this section, the Commission of Experts formulates the main tasks to be tackled.

Make the most of the opportunities offered by digitalization

- In order to meet the challenges of the digital transformation, it makes sense to broadly promote skills in handling digital technologies in all areas of education and training (cf. chapter A 4).¹ Strengthening digital education in German schools is an urgent task. The long-planned Digital Pact for Schools (DigitalPakt Schule) should finally be launched. Tertiary education institutions across all disciplines should teach students of all subjects not only programming skills and proficiency in software and web development, but also data sciences and methods of machine learning. In this context, the new possibilities offered by Article 91b of the Basic Law should be used in a joint effort by the Federal and Länder governments to implement suitable best-practice approaches in tertiary education institutions.
- Internet and internet-based technologies require new or adapted legal frameworks, e.g. in the fields of copyright, data protection, consumer protection and competition law.² As far as possible, these framework conditions should be adapted at the European level. The aim should be not to protect established business models, but to facilitate access for new market participants by making innovative offers.
- Germany is not competitive when it comes to the provision of broadband services with high-performance networks faster than 50 Mbit/s.³

In the new legislative period, the government should lay down ambitious expansion targets and press ahead with their implementation.

- At the end of the last legislative period, the amendment of Article 91c (5) of the Basic Law made it possible to pass the Law for the Improvement of Online Access to Administration Services (Online-Zugangsgesetz); this cleared the way for the establishment and operation of effective central portals for e-government and public data stocks. The aim in the new legislative period must be to actively make the most of the opportunities thus created.⁴ On the one hand, the quality of services provided by public authorities for citizens and businesses should be improved. On the other hand, start-ups and other companies should be given access to public-sector data in order to open up new potential sources of value creation.

Create innovation incentives for start-ups and SMEs

- Unlike most OECD countries, Germany has not used the instrument of tax incentives for R&D activities up to now.⁵ The effectiveness of tax incentives for R&D activities has been proven in numerous international studies. The promotional effects are particularly marked in the case of SMEs. The Commission of Experts therefore again advises introducing such an instrument and focusing it on SMEs. As regards the specific design of tax incentives for R&D activities, the Commission of Experts recommends a tax credit for R&D personnel expenditure that can be offset against payroll tax.
- Venture capital represents an important source of financing for young, innovative companies.⁶ However, only a limited amount of such capital is available in Germany. At the end of the last legislative period, the framework conditions

for venture-capital financing were improved; in the case of publicly financed funds providing venture capital, the organizational structures were adapted and the financial resources increased.⁷ The new Federal Government should continue along these lines. The focus of policy should be on creating incentives for private players to invest in venture-capital funds and start-ups.⁸ Efforts should continue to design the framework conditions for institutional investors in such a way that investments in venture-capital funds financing innovative growth businesses are supported, and recognized anchor investors can emerge.

- The concerns of start-ups and young companies are not yet sufficiently taken into account in R&D funding.⁹ The Commission of Experts recommends adding a research component to complement the EXIST programme in the new legislative period. Recipients of EXIST start-up grants whose companies are in the start-up phase should be enabled to finance staff that might be required for short-term research needs. In addition, there should be a reduction in the formal hurdles for the participation of young companies that are already established in the market in the specialized programmes of the BMBF, BMWi and other ministries.
- The growth of innovative start-ups is hampered by the lack of a legal form for small businesses that is valid Europe-wide.¹⁰ The new Federal Government should campaign at the European level for the creation of a European limited liability company, and this legal form should be made attractive for foreign investors – transaction costs for holdings should be minimized.

Strengthen the science system further

- In the new legislative period, decisions will have to be made about whether the Higher Education Pact (Hochschulpakt) is to be continued and, if so, in what form.¹¹ The Commission of Experts is in favour of the Federal and Länder governments initiating a follow-up programme to the Higher Education Pact over several legislative periods. The Federal Government should continue to support the Länder in financing teaching and overhead costs. Not only the number of students, but also the student/faculty ratios and other quality-relevant indicators should be taken into account in the allocation of resources. However, federal support must not lead to the Länder

reducing their own contributions to the funding of tertiary education institutions. Furthermore, the universities and universities of applied sciences (cf. chapter A 3) require a substantial improvement in their basic funding.

- In addition, the Commission of Experts advocates a continuation of the Pact for Research and Innovation (Pakt für Forschung und Innovation). When the research-policy goals to be implemented by the non-university research institutions are updated, there should be greater emphasis on the transfer of knowledge and technology. The research institutions should develop and consistently implement a strategy for this.

Make R&I governance more innovation-friendly

- The establishment of the High-Tech Strategy (HTS) successfully strengthened interdepartmental cooperation in the shaping of R&I policy.¹² In the Commission of Experts' view, the HTS should be extended as quickly as possible. In this context, the key challenges – such as sustainability (cf. chapter A 2) or digitalization (cf. chapter A 4) – should be identified, clear target hierarchies formulated and milestones laid down.
- The Commission of Experts advises paying greater attention to important cross-cutting issues such as autonomous systems and artificial intelligence (cf. chapter B 3). The approaches to managing the digital transformation should not relate to individual industries or technological areas, but be comprehensive.
- The Commission of Experts is in favour of setting up an agency to promote radical innovations in the new legislative period.¹³ It thus endorses a proposal drawn up in the summer of 2017 within the framework of the innovation dialogue (Innovationsdialog) between representatives from science, business and civil society.¹⁴ The Commission of Experts believes that the existing research funding structures are unsuitable for creating sufficient incentives for implementing particularly high-risk and visionary projects. In this context, the new agency for the promotion of radical innovations should have considerable freedom and be able to act in its day-to-day business with a maximum degree of independence from political control (cf. also chapter B 2 on the European discussion).

- The new Federal Government should introduce an immigration law covering labour-related migration¹⁵ that facilitates the immigration of people who are professionally qualified but have no academic degree, as well as people who would like to complete an in-company apprenticeship in Germany.¹⁶
- Innovation-oriented procurement can be used as an instrument of strategic R&I policy. The Commission of Experts advocates that the new Federal Government should aim to adapt the legal framework and practice of public procurement by giving ‚priority to the more innovative offer‘. The considerable volume of public procurement should be used more to promote innovation than it has in the past.¹⁷

Targets for the year 2025

Concrete and verifiable targets must be formulated for the further development of the R&I policy. In doing so, the Federal Government should not restrict itself to the narrow time frame of one legislative period. In this context, the Commission of Experts reiterates its proposed targets for the year 2025:¹⁸

- Spend 3.5 percent of GDP on R&D,
- Establish at least three German universities among the world’s 30 leaders,
- Double venture capital’s share of gross domestic product to 0.06 percent,
- Catch up with the five leading nations in the field of digital infrastructure,
- Double the share of funding in the field of digitalization,
- Take on a pioneering role in e-government.