

REPORT ON RESEARCH,
INNOVATION AND TECHNOLOGICAL
PERFORMANCE IN GERMANY

COMMISSION OF EXPERTS
FOR RESEARCH
AND INNOVATION



REPORT

2023 2024 2025

2026 2027 2028

2029 2030 2031

EXECUTIVE SUMMARY

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Executive Summary

A Current Developments and Challenges

A0 R&I policy at a turning point in history

In its 2021 and 2022 reports, the Commission of Experts emphatically emphasized the crucial importance of research and innovation (R&I) for mastering the major transformations, such as the energy transition, the mobility transition and the digitalization of the economy and society. The complex R&I policy tasks associated with these transformations are further complicated by the Covid-19 crisis and the war in Ukraine. Germany's scope for action to support and orchestrate the forthcoming major transformations with R&I policy and to actively tackle them with the help of innovative solutions is being massively restricted as a result. Whether the Federal Government will succeed in mastering the current crises and transformation challenges also depends on whether agile policy action is enabled by means of adequate decision-making processes and governance structures. Equally, German R&I policy requires long-term orientation, strategic planning and clear priorities. A new era is also needed in R&I policy.

A1 Creating agile governance structures

A new, agile policy style and a governance structure to match are needed to advance the major transformations swiftly and in a socially acceptable manner, while at the same time safeguarding the competitiveness of the German economy and its companies. Silo mentality within the Federal Government must be overcome and cooperation between the ministries improved. In this context, the Commission of Experts recommends establishing a government committee for innovation and transformation incorporated in the Federal Chancellery. In addition, interdepartmental mission teams should be formed quickly and the ministries involved should be integrated at state secretary level. Moreover, the project-executing agency system should be reformed by bundling R&I programmes mission-related with the respective project-executing agencies and by steering the use of funding in a more outcome-oriented manner.

A2 Tackling the grand societal challenges

The Commission of Experts is of the opinion that the Federal Government should vigorously pursue the policy approach of New Mission Orientation. Within the six missions of the Future Strategy for Research and Innovation, which are very broadly conceived, several action-guiding missions should be agreed upon in each case and underpinned by measurable transformation goals. Roadmaps should be developed for each of these action-guiding missions, which coordinate and structure the activities of the various ministries in terms of content and timing. In light of the war in Ukraine, there is a risk that the goals of energy security and climate protection will be pitted against each other. The Commission of Experts maintains that the expansion of renewable energy and the increase in energy efficiency contribute to both energy security and climate protection in the long term.

A3 Catching up and avoiding technological gaps

The ongoing transformations will not be mastered without innovative technologies. Key enabling technologies are of particular importance in this context. Germany, and to some extent Europe, are not at the forefront of these technologies in an international comparison. More dynamic developments can be observed especially in Asia. To avoid losing touch in the key enabling technologies, Germany and its European partners must accelerate the development and advancement of the corresponding competencies as well as the regulatory framework and infrastructure. It is also important to reduce dependence on China and to initiate a fundamental reform of digitalization governance in Germany. In parallel, the strict separation of military and civilian research that exists in Germany should be abandoned to facilitate synergies.

A4 Removing barriers to innovation

The current situation of overlapping crises is putting a strain on many companies and exposing them to high levels of uncertainty. This raises the risk of research-based companies cutting back on longer-term investments in R&I or even withdrawing from the market altogether. The main objective of R&I policy must therefore be to provide effective incentives for the continuation of R&I activities and for the establishment of new innovative companies. At the same time, existing regulations and lengthy administrative procedures prevent and slow down innovation processes. The Federal Government can therefore promote R&I activities not only by providing financial support, but also by improving the framework conditions to create new incentives for innovation, for example in the data economy and in public procurement, and to reduce barriers to innovation.

A5 Securing the skilled labour base

In the years ahead, the pressure to secure the skilled labour base in Germany, already noticeable today, will continue to increase. Due to the demographic ageing of society, the working age population will shrink significantly, meaning that growth- and innovation-impeding shortages of skilled workers are likely to intensify and become more prevalent. It is therefore necessary to make better use of the existing skilled labour base and to attract foreign skilled workers. As a result of the structural change taking place alongside demographic change, increased efforts in education and training are also needed. In addition, the ability to plan the careers of researchers in the doctoral and postdoc phases should be improved.

A6 Key recommendations for action

- Establish a government committee for innovation and transformation
- Integrate state secretaries in mission teams
- Reform the project-executing agency system
- Create mission-related roadmaps
- Avoid unintended knowledge outflow to China
- Relaunch governance for administrative digitalization
- Create synergies between military and civilian research
- Make greater use of real-world laboratories and evaluate them systematically
- Set clear rules for data economy
- Improve scientific career planning

B Core Topics 2023

B 1 Innovation in an ageing society

Demographic ageing threatens the preservation of Germany's innovation capacity. In the future, it will therefore be of increasing importance that older people can contribute to innovation as employees and through business start-ups. To make the best possible use of the innovation potential of older people, the Commission of Experts recommends that:

- Older employees should be given attractive options for retiring later at their own request.
- The Commission of Experts does not see any particular need for protection when retirees enter into a new employment relationship. For this reason, a fixed-term contract without an objective reason should always be an option, even multiple times.
- The initiation and start-up funding of regional and sector-related platforms should be considered to support SMEs in the recruitment of senior experts.
- Older entrepreneurs should be systematically included in existing formats of start-up promotion. Stereotypes of 'young' entrepreneurs should be eliminated when addressing those interested in establishing a business.

Demographic ageing also affects social cohesion in an increasingly digital society, where a minimum level of digital literacy is a prerequisite for social participation. Moreover, the social security systems are confronted with mounting financing problems as a result of demographic ageing. The Commission of Experts therefore makes the following recommendations:

- The conditions for older people's digital participation must be improved. In addition to expanding the broadband network, systematic measures for increasing the digital competence of older people are of vital importance.
- The digitalization of public services should be actively advanced. This should be combined with comprehensive support services for older users that focus on the attainment of digital skills.
- To optimally leverage digital innovations in the health and care system, professionals working in health and care need basic and job-specific digital competences. Therefore, developments in medical technology should be systematically integrated into the curricula of nursing training.
- The steps adopted in the coalition agreement on innovation-promoting reforms, such as those of the Federal Joint Committee (G-BA), should be implemented without delay.

B 2 Markets for technology

Technological knowledge is traded on markets for technology in the form of intellectual property rights (IP rights, e.g. patents). Markets for technology enable better exploitation of IP rights and thereby create incentives to invest in research and development. However, the functioning of markets for technology is limited by several obstacles. Actors in markets for technology often find it difficult to find suitable trading partners or to reliably assess the value of an IP right. The Commission of Experts recommends the following measures to leverage the potential of innovation and value creation associated with greater participation in technology trade and improved functioning of markets for technology:

- To reduce search and transaction costs and enable better matches, R&I policy should drive the further development of the patent offices' (German Patent and Trade Mark Office and European Patent Office) public and freely accessible databases, for example with the help of AI-assisted methods.
- In addition, the deal database envisioned in the Federal Government's Startup Strategy should be established at the patent offices.
- The Federal Government should initiate and promote an information campaign to provide potential market participants with more information about these databases.
- To improve transparency about ownership of IP rights and thus reduce search costs for potential buyers, greater incentives should be provided for reporting transfers of ownership centrally and quickly to the German Patent and Trade Mark Office (Deutsches Patent- und Markenamt, DPMA).
- Financial incentives in the form of a reduced renewal fee for patents should be provided for the non-binding declaration of willingness to license.
- Low-threshold information and advisory services are particularly important for small and medium-sized enterprises. Existing initiatives to promote the patenting and exploitation of inventions, such as the support programme WIPANO – Knowledge and Technology Transfer via Patents and Standards, should be continued and expanded.
- To facilitate rapid technology transfer, contractual standards should be established that take into account the interests of all actors involved in technology trade.
- To promote the transfer and economic utilization of research results, technology transfer and exploitation of patented inventions should be further professionalized and made more entrepreneurial and competitive.

B3 German aerospace between old and new space

Space flight has changed rapidly worldwide in recent decades. Having been mainly state-managed until the 2000s, a strongly private-sector driven space economy is currently developing. Still, the state plays an important role – not least because of the high strategic relevance of space flight for the economy and society as well as the preservation of technological sovereignty. However, the space industry in Germany and Europe operates in an environment determined by pronounced national and supranational interests, a complex funding landscape and, in Germany, uncertainty about the future regulatory framework. Given the increasing importance of space flight, the Commission of Experts recommends the following measures:

- The Federal Government must swiftly adopt and implement a new space strategy.
- The Federal Government must create suitable structures for interdepartmental cooperation in the implementation and further development of the space strategy.
- Germany should adopt a national space law that regulates the approval and monitoring of space activities, the registration of space objects, and the liability in the event of damage.
- The infrastructure required to implement this space law should be integrated into the German Space Agency. The German Space Agency, in turn, should be disaffiliated from the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR) and set up as an independent actor.
- Cooperation between civilian and military actors in the provision and operation of space infrastructure should be intensified and synergies created through joint use.
- The Federal Government should consider entering into anchor tenancy contracts for clearly specified but technologically open contracts with companies in the space industry and in coordination with the space agencies.
- Technological sovereignty in the field of space must be thought of in European terms to keep efficiency losses to a minimum.
- The Federal Government should lobby the EU to ensure that the critical space infrastructure used in the European network is effectively protected.
- The possibility of relaxing the principle of geographical return of ESA funds in favour of efficiency criteria should be examined.

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