A 1 Implementation of the High-Tech Strategy 2025

In 2018, expenditure on research and development (R&D) accounted for 3.13 percent of gross domestic product (GDP),[1] i.e. Germany's R&D intensity rose again. That is an important step towards reaching the target formulated in the High-Tech Strategy 2025 (Hightech-Strategie 2025, HTS 2025) of spending 3.5 percent of GDP on R&D by 2025.[2]

In 2019, the introduction of tax incentives for R&D, signalled in the HTS 2025, and the establishment of the Federal Agency for Disruptive Innovation, created two new instruments of R&I policy. In the same year, the Federal Government set up the Next Generation Cluster Initiative (Zukunftscluster-Initiative), thus launching a new, major cluster programme after the Leading-Edge Cluster Competition had expired. In its newly adopted Blockchain Strategy, the Federal Government identifies measures designed to help tap the potential of blockchain technology; and in its ‚Interim Report: AI Strategy, One Year On' (Zwischenbericht ein Jahr KI-Strategie), it presents its activities in the field of artificial intelligence (AI). The pricing of carbon dioxide (CO_2), as envisaged in the Climate Protection Programme 2030, aims to also provide incentives for climate-friendly innovation.

Introduction of R&D funding through tax incentives

The Law on Tax Incentives for R&D (Forschungszulagengesetz) was passed by the Bundestag and Bundesrat in 2019 and came into force at the beginning of 2020.[3] Hence, the instrument of offering tax incentives for R&D is now also available in Germany, as had long been called for by the Commission of Experts.[4]

Companies that conduct their own R&D and companies that award R&D contracts to third parties are eligible for tax-based R&D funding.[5] The Commission of Experts welcomes the fact that R&D contracts are attributed to the companies that award the contracts. On the one hand, this is particularly important for SMEs that have little in the way of in-house R&D resources. On the other hand, the transfer of knowledge and technology from science to business is further boosted when R&D contracts are awarded to tertiary education institutions and non-university research institutions.

In cases where a company conducts its own R&D projects, the eligible costs result from the costs of the R&D personnel employed.[6] In cases where R&D contracts are awarded, the pro-rata contract value is recognized.[7] The basis of assessment corresponds to the eligible expenses of the respective financial year up to a maximum of €2 million.[8] The tax-based R&D funding amounts to 25 percent of this assessment basis, i.e. up to a maximum of €500,000 per financial year. Consequently, companies whose eligible expenses are below €2 million benefit more from the research subsidy relatively than companies whose eligible expenses exceed this threshold. The planned evaluation of the research subsidy will have to show whether its design can develop the desired incentive effect.

The tax-based R&D funding can be claimed after the end of the financial year in which the eligible expenditure was incurred. It is credited against income or corporation tax[9] in such a way that the research subsidy for a given year can be credited against the next income or corporation tax – irrespective of the assessment period. The Commission of Experts' assessment of this is positive. For start-ups and SMEs in particular, the sooner tax-based R&D funding has an impact on liquidity, the greater the incentive effect.

Furthermore, for start-ups it is important that they also benefit from tax-based R&D funding if their tax debt is low or non-existent. If the tax-based R&D funding to be credited exceeds the assessed income or corporation tax, it is paid out.

Federal Agency for Disruptive Innovation founded

In its 2018 annual report, the Commission of Experts advocated the establishment of a Federal Agency for Disruptive Innovation.[10] The Federal Government announced in the HTS 2025 that it would set up an agency of this kind.[11] A corresponding key issues paper was already adopted by the cabinet in August 2018.[12]

In the summer of 2019, the founding director of the Federal Agency for Disruptive Innovation was named, and Leipzig was selected as the agency's location. The establishment of the Federal Agency for Disruptive Innovation (SprinD GmbH) then followed in autumn 2019.[13] Policy-makers have an opportunity to influence the entrepreneurial decisions of SprinD GmbH via the shareholders' meeting and the supervisory board. In this context, the political representatives are called upon to strike an appropriate balance between the responsible use of taxpayers' money and entrepreneurial risk. The Commission of Experts strongly believes that the management should be given a maximum degree of independence from political control and departmental thinking and, above all, should itself determine the thematic focus of SprinD GmbH.

Next Generation Cluster Initiative launched

In summer 2019, the Federal Ministry for Education and Research (Bundesministerium für Bildung und Forschung, BMBF) launched the Next Generation Cluster Initiative to promote the development of regional clusters in innovative fields with high growth potential.[14] The aim is to take certain state-of-the-art technologies, scientific methods and instruments from research into application as quickly as possible.[15] The initiative is designed as a multi-stage, competitive procedure and makes provision for several rounds of competition. In what is known as the conception phase, the innovation networks are each funded with up to €250,000. The innovation networks selected for the implementation phase can be funded with up to five million euros per year respectively for up to nine years. Although the funding policy does not exclude any topics or fields of application, it does specify fields of action that are regarded as priorities.[16] The Commission of Experts supports the initiative's general objective, but criticizes the fact that the funding guideline was not formulated in a way that is completely open to all topics and technologies.

Federal Government's Blockchain Strategy adopted

In September 2019, the Federal Cabinet adopted the Federal Government's Blockchain Strategy (Blockchain-Strategie der Bundesregierung).[17] The aim is to use the opportunities offered by blockchain technologies and to mobilize their potential for digital transformation.[18] The Federal Government drew up its Blockchain Strategy on the basis of a consultation process and plans to continue the dialogue with the private business sector, civil society and experts.[19] The Commission of Experts welcomes the fact that the Federal Government is systematically seeking the expertise of the stakeholders in its Blockchain Strategy in order to identify the kind of framework conditions that can hinder the development and scaling of blockchain applications.

In its Blockchain Strategy, the Federal Government formulates five fields of action,[20] allocates measures to them, and designates responsibilities. The Commission of Experts calls on the Federal Government to back up the measures listed with milestones and transparently document the achievement of the milestones.

Implementation of the AI Strategy has begun

The Federal Government's AI Strategy (Strategie Künstliche Intelligenz der Bundesregierung) was adopted by the Federal Cabinet in November 2018.[21] In November 2019, the Federal Government published the ‚Interim Report: AI Strategy, One Year On', listing measures that are being implemented or planned.[22] The key measures of the AI strategy include the further development of the German Competence Centres for AI (Kompetenzzentren für KI-Forschung), the creation of 100 new professorships, the development of a data infrastructure, and support for the transfer of knowledge and technology.

In addition to the German Research Centre for Artificial Intelligence (Deutsches Forschungszentrum für Künstliche Intelligenz, DFKI), the BMBF is currently funding five other German Competence Centres for AI.[23] In its AI Strategy, the Federal Government has announced its intention to further develop the existing German Competence Centres for AI on a supraregional basis and expand them into a national network.[24] Funding for the existing centres is to be doubled by the year 2022.[25] In the long term, the Federal Government plans to stabilize the funding

of the centres together with the Länder in which they are located.[26] With regard to the performance and international visibility of Germany's AI locations, the Commission of Experts welcomes the fact that the Federal Government's focus is on strengthening and internationally networking existing centres and not on setting up new ones.

In line with its AI Strategy, the Federal Government aims to ensure that AI has a broad and stable base at tertiary education institutions by creating at least 100 additional professorships.[27] In order to attract leading scientists and scholars from abroad, thirty Alexander von Humboldt Professorships in the AI field have been advertised.[28] In addition, the establishment of new AI professorships is to be promoted by expanding the German Competence Centres for AI.[29] Furthermore, the Federal Government intends to ensure scientific expertise in the AI field by strengthening the promotion of young researchers.[30] The Commission of Experts expressly supports this project.

Together with partners from the business and science communities, the Federal Government intends to create a networked and open data infrastructure with its GAIA-X project presented in October 2019.[31] It aims to make available data and services for AI applications while guaranteeing digital sovereignty.[32] The Commission of Experts supports the project's objectives, since improved data availability for German and European actors will create new innovation potential in the AI field. However, the Commission of Experts also points out that the effects intended can only be achieved if GAIA-X is implemented quickly, has a critical minimum capacity and guarantees a high degree of user-friendliness.[33]

In 2019, the Federal Government conducted an innovation competition called ‚Artificial Intelligence as a Driver for Economically Relevant Ecosystems' and launched a pilot innovation competition entitled ‚Energy-efficient AI System'.[34] Alongside these two application-related innovation competitions, the Federal Government is implementing further measures to promote the transfer of knowledge and technology in the AI sector. These include the use of so-called AI trainers and the development of the AI Map (KI-Landkarte).[35] The Commission of Experts calls on the Federal Government to further promote the transfer of knowledge and technology in the AI field.

Climate Package under way

In its 2019 Report, the Commission of Experts pointed out that innovative technologies and business models can make a decisive contribution to the Energy Transition. Many technologies considered important by experts have already reached market maturity. However, their diffusion is inhibited by the fact that negative external effects of CO_2 emissions are not being internalized.[36] The Fuel Emissions Trading Act was adopted as part of the implementation of the Climate Protection Programme 2030 presented by the Federal Government in October 2019 – also known as the Climate Package. It provides for the introduction of tradeable emission allowances for the heating and transport sectors in 2021.[37] In the years 2021 to 2025, the allowances will be sold at a fixed price, from 2026 onwards by auction. In this context, pricing will take place within a fixed price corridor in 2026. The Fuel Emissions Trading Act provides for a gradual increase in the fixed price for emission allowances from €10 to €35 per allowance in the years 2021 to 2025, and for a price corridor between €35 and €60 per emission allowance in 2026.[38] In addition to adjustments to tax law, the compromise reached by the Mediation Committee of the Bundestag and Bundesrat on the tax measures in the Climate Protection Programme 2030 includes a redefinition of the prices for emission allowances.[39] Accordingly, the emission price is to gradually rise from €25 to €55 per emission allowance in the period from 2021 to 2025 and will be between €55 and €65 in 2026. In the opinion of the Commission of Experts, the CO_2 prices currently provided for in the Fuel Emissions Trading Act are not high enough to sustainably promote the use of climate-friendly technologies and business models. It believes that the emission prices proposed by the Mediation Committee are more likely to have the desired effect.

In order to ensure social acceptance of CO_2 pricing, the Commission of Experts advocates mitigating disproportionate energy-cost burdens for low-income households by making a flat-rate reimbursement.[40] However, compensating measures should not impair the effectiveness of CO_2 pricing. The Commission of Experts therefore considers it counter-productive to increase the commuter allowance and grant a mobility premium for the period 2021 to 2026 as provided for in the ‚Act for the Implementation of the Climate Protection Programme 2030 in Tax Law'.[41]