Organisation for Economic Co-operation and Development

Survey response for Germany

OECD database of governance of public research policy

This document contains detailed responses for Germany to the survey on governance of public research policy across the OECD. It provides additional background information to the OECD database of governance of public research policy as described in Borowiecki, M. and C. Paunov (2018), "How is research policy across the OECD organised? Insights from a new policy database", *OECD Science, Technology and Industry Policy Papers*, No. 55, OECD Publishing, Paris, https://doi.org/10.1787/235c9806-en. The data was compiled by the OECD Working Party on Innovation and Technology Policy (TIP). Data quality was validated by delegates to OECD TIP Working Party the in the period between March 2017 and May 2018. Additional references that were used to fill out the questionnaire are indicated.

The data is made freely available online for download at https://stip.oecd.org/resgov.

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Abbreviations and acronyms

BMBF	Federal Ministry of Education and Research Bundesministerium für Bildung und Forschung
DFG	Deutsche Forschungsgemeinschaft
EFI	Expert Commission for Research and Innovation Expertenkommission Forschung und Innovation
ERC	European Research Council
GWK	Joint Conference for Science and Humanities Gemeinsame Wissenschaftskonferenz
HEIs	Higher Education Institutions
HGF	Helmholtz Association of German Research Centres Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e. V.
MPG	Max Planck Society Max-Planck-Gesellschaft zur Förderung der Wissenschaften e. V.
NRW	North Rhine-Westphalia
PRIs	Public Research Institutes
WR	Council of Science and Humanities Wissenschaftsrat

Survey of public research policy

Topic 1: Institutions in charge of priority setting, funding and evaluations

Table 1. Questions on institutions in charge of priority setting, funding and evaluations of universities and PRIs

Question	Response
Q.1.1. Who mainly decides on the **scientific, sectoral and/or thematic priorities of budget allocations** for a) HEIs and b) PRIs?	a and b) Institutions themselves decide about scientific, sectoral and thematic orientation of pubic budget allocations for teaching and research at HEIs and PRIs.
c) Which are the main mechanisms in place to decide on **scientific, sectoral and/or thematic priorities of national importance**, e.g. digital transition, sustainability? Please describe who is involved and who decides on the priorities (e.g., government, research and innovation councils, sector-specific platforms including industry and science, etc.). *(This question does not refer to who sets overall science, technology and industry priorities. This is usually done by parliaments and government. The question refers to decisions taken after budgets to different ministries/agencies have been approved. Scientific priorities refer to scientific disciplines, e.g. biotechnology; sectoral priorities refer to industries, e.g. pharmaceuticals; and thematic priorities refer to broader social themes, e.g. digital transition, sustainability, etc.)*	The biggest four PRIs are the Max Planck Society (Max-Planck-Gesellschaft zur Förderung der Wissenschaften e. V., MPG), the Fraunhofer Society (Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V.), the Helmholtz Association of German Research Centres (Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e. V., HGF), and the Leibnitz Society (Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz e. V.). National research and innovation priorities are set out by in the High-Tech Strategy (2006). Since 2007, PRIs commit to the STI objectives as laid out in the High-Tech Strategy in return for increases in institutional funding (Federal Ministry of Education and Research, 2016a). PRIs participate together with the Federal government and the Federal States in the formulation of those objectives and enjoy a considerable degree of strategic autonomy (e.g. they themselves evaluate their performance) (EC/OECD STI Policy Survey 2016, response B12_b, B12_d and C6).
d) From 2005-16, were any significant changes introduced as to how decisions on scientific, sectoral and/or thematic orientation of major programmes are taken (e.g. establishment of agencies that decide on content of programmes)?	c) In Germany, Federal state (Bundesländer) ministries decide about higher education policy. However, institutions enjoy autonomy to use and allocate public funding according to their own priorities. Since 2007, university reforms have increased university autonomy while at the same time the Federal government introduced new national priorities for the German research system (High-Tech Strategy). In most Federal states, performance agreements between ministries and HEIs were introduced to set objectives and targets for public funding for teaching, research, and innovation (EC/OECD STI Policy Survey 2016, responses C6). In Baden Württemberg, for instance, the Ministry of Science, Research and Culture introduced a new funding scheme for HEIs in 2015; the scheme saw increases in institutional funding but also set out targets and objectives for HEIs (Perspektive 2020 Hoschulfinanzierungspakt, Ministry of Science, Research and Culture Baden Württemberg, 2016). The Federal level decides on policy priorities with regard to large infrastructure spending and research excellence schemes which also affect HEIs (Initiative for Excellence) (EC/OECD STI Policy Survey 2016, responses B12_d and H4; Federal Ministry of Education and Research, 2016b).

d) From 2005-16, were any significant changes introduced as to how decisions on scientific, sectoral and/or thematic orientation of major programmes are taken (e.g. establishment of agencies that decide on content of programmes)?	d) *Changes over 2005-2016* High-tech Strategy (2006); Pact for Research and Innovation (2007): PRIs commit to STI objectives as laid out in the High-Tech Strategy of the Federal Government in return for an increase in institutional funding
References: EC/OECD STI Policy Survey 2016 for Germany. Responses B12, C6 and H4. Federal Ministry of Education and Research (2016a), Pakt für Innovation und Forschung, website (German), Available at https://www.bmbf.de/de/pakt-fuer-forschung-und-innovation-546.html (accessed 20 December 2016). Federal Ministry for Education and Science (2017b), Zusammenarbeit zwischen Bund und Ländern, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Rechtliche-Grundlagen-1787.html (Accessed 13 January 2017). Ministry of Science, Research and Culture Baden Württemberg (2016), Hochschulfinanzierung, website (German), Available at https://mwk.baden-wuerttemberg.de/de/hochschulen-studium/hochschulfinanzierung/ (Accessed 19 December 2016).	
Q.1.2. Who allocates **institutional block funding** to a) HEIs and b) PRIs? *(Institutional block funds (or to general university funds) support institutions and are usually transferred directly from the government budget.)* c) Who allocates **project-based funding** of research and/or innovation for HEIs and PRIs? *(Project-based funding provides support for research and innovation activities on the basis of competitive bids.)* d) Is there a transnational body that provides funding to HEIs and PRIs (e.g. the European Research Council)? e) What is the importance of such funding relative to national funding support? f) From 2005-16, were any changes made to way programmes are developed and funding is allocated to HEIs and PRIs (e.g. merger of agencies, devolution of programme management from ministries to agencies)?	a and b) Federal State ministries allocate institutional block funding to HEIs and also to a big degree to PRIs (EC/OECD STI Policy Survey 2016, response B12_d and H4). PRIs receive also parts of their public budget (two thirds) from the Federal Ministry of Education and Research (BMBF) and allocate funds to their research institutes themselves (Federal Ministry of Education and Research, 2016c). MPG, Fraunhofer Society, HGF and Leibniz Society are research performing organisations and research funding organisations at the same time (EC/OECD STI Policy Survey 2016, response B12_d and C6). The relationship between the Federal government and the Federal States is complex and defined in the German constitution (Art. 91b Abs. 1 Grundgesetz). The Federal level exerts influence with regard to supra-regional research and innovation of higher impact, primarily through the Pact for Higher Education (Hochschulpakt 2007; Federal Ministry of Education and Research, 2016d), the Initiative for Excellence (2007; Federal Ministry of Education and Research, 2016a), and the Pact for Research and Innovation (2005; Federal Ministry of Education and Research, 2016e). Research projects at HEIs under the Initiative for Excellence, for instance, are funded to 75% by the Federal level. The performance of the Initiative for Excellence is monitored by the Joint Conference for Science and Humanities (Gemeinsame Wissenschaftskonferenz, GWK) which consist of representatives from the Federal government and the governments of the Federal states. c) With regard to project-based funding, the national funding agency DFG develops programmes supporting research and innovation at HEIs and PRIs and allocates budget to them. DFG is funded to 58% by the Federal level and to 42% by the Federal states (Federal Ministry of Education and Research, 2016b). The BMBF provides grants for innovation. d) In Germany, HEIs and PRIs are eligible for additional funding from the European Research Council (ERC) and the European Commission. e) Even though the amount of transnational funding is relatively low compared to the national funding in total, transnational funding is of high importance for fostering international collaboration or for supporting specific research areas of international relevance. f) *Changes over 2005-2016* Pact for Research and Innovation (2005); Pact for Higher Education (2007); Initiative for Excellence (2007)

References:
EC/OECD STI Policy Survey 2016 for Germany. Response B12, C6 and H4.
Federal Ministry of Education and Research (2016a), Exzellenzinitiative, website (German), Available at http://www.bundesbericht-forschung-innovation.de/de/Exzellenzinitiative-1790.html (accessed 20 December 2016).
Federal Ministry of Education and Research (2016b), FuE-fördernde Akteure, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Weitere-FuE-fordernde-Akteure-1656.html (Accessed 13 January 2017).
Federal Ministry of Education and Research (2016c), Grundfinanzierung der Forschungseinrichtungen, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Grundfinanzierung-der-Forschungseinrichtungen-1789.html (Accessed 13 January 2017).
Federal Ministry of Education and Research (2016d), Hochschulpakt 2020, website (German), Available at http://www.bundesbericht-forschung-innovation.de/de/Hochschulpakt-2020-1792.html (accessed 20 December 2016).
Federal Ministry of Education and Research (2016e), Pakt für Innovation und Forschung, website (German), Available at https://www.bmbf.de/de/pakt-fuer-forschung-und-innovation-546.html (accessed 20 December 2016).
Ministry of Science, Research and Culture Baden Württemberg (2016), Hochschulfinanzierung, website (German), Available at https://mwk.baden-wuerttemberg.de/de/hochschulen-studium/hochschulfinanzierung/ (Accessed 19 December 2016).

Q.1.3. Do **performance contracts** determine funding of a) HEIs?
Institutional block funds can be partly or wholly distributed based on performance. (Performance contracts define goals agreed between ministry/agency and HEIs/PRIs and link it to future block funding of HEIs and PRIs.)

b) What is the share of HEI budget subject to performance contract?

c) Do performance contracts include quantitative indicators for monitoring and evaluation?
d) What are the main indicators used in performance contracts? Which, if any, performance aside from research and education is set out in performance contracts?

e) Do HEIs participate in the formulation of main priorities and criteria used in performance contracts?

f) Do the same priorities and criteria set in performance contracts apply to all HEIs?

a) Most of the Federal states exercise a performance oriented distribution of funding, the so-called "leistungsorientierte Mittelvergabe", which includes performance agreements (EC/OECD STI Policy Survey 2016, response C6).

b to f) Differences across Federal States exist. They range from 2% of university funding in Brandenburg to 23% in North Rhine-Westphalia.

North Rhine Westphalia
In North Rhine-Westphalia, for instance, 23% of HEI funds are allocated based on a system that takes into account performance indicators of HEIs (de Boer et al., 2015, pp. 73-79). Performance agreements were introduced in 1999. The performance agreements bind future funding of HEI to performance criteria with regard to teaching, research and innovation. Public funding is allocated based on indicators that capture teaching quality, research outcomes and valorisation/commercialisation, e.g. share of industry funded R&D at HEIs (de Boer et al., 2015, pp. 77).

In 2013, an evaluation of performance agreements in NRW concluded that they have had a rather modest an impact on actual performance because the volume of the performance-based funding is limited. The evaluation also reported that the effects of these agreements were primarily of strategic nature. Universities used performance agreements for the establishment and implementation of institutional strategies; they contributed to changes in the internal allocation of funds and that institutions have started to establish internal allocation procedures that use similar regulations or instruments (Smitten and Jäger, 2013).

g) Are any other mechanisms in place to allocate funding to HEIs and PRIs? h) From 2005-16, were any changes made to funding of HEIs and PRIs? *(In case performance contracts are in place that bind funding of PRIs, please provide information about them.)*	g and h) Beyond performance agreements between Federal State ministries and HEIs, there have been several agreements between the federal level and the federal states, e.g. Higher Education Pact 2020. The Higher Education Pact 2020 aims to support higher education institutions in tackling the increasing number of students that are expected to enter university until 2020. In return for additional funds, HEIs are expected to increase enrolment number in particular in science, technology, engineering and mathematics (STEM) subjects (EC/OECD STI Policy Survey 2016, response H4). PRIs are not bound by performance agreements. However, the Pact for Research and Innovation (2005) and the Academic Freedom Act (2012) introduced incentives for PRIs to align their research and innovation with national priorities as set out in the High Tech Strategy in 2006 (Federal Ministry of Education and Research, 2016). In return for increases in institutional funding until 2020, the institutions commit to the STI objectives laid out in the High-Tech Strategy (EC/OECD STI Policy Survey 2016, responses B12_d, C4 and C6).

References:

EC/OECD STI Policy Survey 2016 for Germany. Responses B12, C4, C6 and H4.

De Boer et al. (2015), Performance-based funding and performance agreements in fourteen higher education systems: Report for the Ministry of Education, Culture and Science, p. 73-79, Center for Higher Education Policy Studies, Enschede, the Netherlands.

Federal Ministry of Education and Research (2016), Pakt für Innovation und Forschung, website (German), Available at https://www.bmbf.de/de/pakt-fuer-forschung-und-innovation-546.html (accessed 20 December 2016).

German Rectors Conference (2012), Zielvereinbarungen (ZV) bzw. Hochschulverträge im Länder- und Hochschulvergleich, website (German), Available at https://www.hrk.de/fileadmin/redaktion/hrk/02-Dokumente/02-06-Hochschulsystem/Hochschulfinanzierung/Zielvereinbarungen_der_Laender.pdf (Accessed 16 January 2017).

Landesrektorenkonferenz Baden-Württemberg (2015), Perspektive 2020: Hochschulfinanzierungsvertrag Baden-Württemberg 2015-2020, p. 10, Available at http://www.lrk-bw.de/images/PDF/Anlage_zu_PM_003_Hochschulfinanzierungsvertrag.pdf (Accessed 19 December 2016).

Ministry of Science, Research and Culture Brandenburg (2014), Hochschulverträge/Zielvereinbarungen an Brandenburger Hochschulen, website (German), Available at: http://www.mwfk.brandenburg.de/sixcms/detail.php/504121 (Accessed 16 January 2017).

Ministry of Innovation, Science and Research North Rhine-Westphalia (2017), Grundfinanzierung, website (German), Available at: http://www.wissenschaft.nrw.de/hochschule/finanzierung/grundfinanzierung/ (Accessed 13 January 2017)

Smitten, S. and Jäger, M. (2013), Stellungnahme Hochschulsteuerung durch Leistungsorientierte Mittelvergabe in NRW: Stellungnahme zur öffentlichen Anhörung des Ausschusses für Innovation, Wissenschaft und Forschung des Landes Nordrhein-Westfalen am 3. Juli 2013, Hochschul Informations System GmbH.

Q.1.4. Who decides on the following key **evaluation** criteria of HEIs and PRIs? Who is responsible for setting criteria to use when evaluating performance of a) HEIs? Who is responsible for b) evaluating and c) monitoring HEIs' performance? Who is responsible for setting criteria to use when evaluating performance of d) PRIs? Who is responsible for e) evaluating and f) monitoring PRIs' performance? h) From 2005-16, was any institution created for evaluating HEIs and PRIs or were any changes made to criteria applied for evaluations of HEIs and PRIs?	a, c and e) In terms of evaluation of HEIs, Federal state ministries define performance criteria to be used for evaluations. *Baden Württemberg* In Baden Württemberg, for instance, a joint working party consisting of representatives from the Ministry of Science, Research and Culture and HEIs is currently drafting performance criteria to be used for HEIs until 2017. They should include indicators on teaching quality and capacities, research outcomes and quality, young scientists, gender equality, and knowledge and technology transfer (Landesrektorenkonferenz Baden-Württemberg, 2015). b, d and f) PRIs evaluate their performance themselves. Criteria are defined by the Joint Conference for Science and Humanities (Gemeinsame Wissenschaftskonferenz, GWK) where both the Federal government and the Federal States are represented (EC/OECD STI Policy Survey 2016, responses B12_d and C4). h) *Changes over 2005-2016* The GWK was established in 2008 and succeeded the former Commission for the Planning of Formation and Research Promotion (Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung); it monitors the performance of PRIs on the basis of institutional self-reporting. The policy objectives to be addressed by PRIs are defined in the Pact for Research and Innovation and include the dynamic development of the research system, linkages within the research system, deepening of international and European cooperation, strengthening of exchange between science and industry, and competition for the best scientists. A national monitoring system is to be developed jointly by the Federal level and the Federal states that should complement institutional monitoring systems (GWK, 2015, p. 6).
References: EC/OECD STI Policy Survey 2016 for Germany. Response B12 and C4. Landesrektorenkonferenz Baden-Württemberg (2015) Perspektive 2020: Hochschulfinanzierungsvertrag Baden-Württemberg 2015-2020, Available at http://www.lrk-bw.de/images/PDF/Anlage_zu_PM_003_Hochschulfinanzierungsvertrag.pdf, p. 10. (Accessed 19 December 2016). GWK (2015), Pakt für Wissenschaft und Forschung Monitoring Bericht 2015, p. 6, Available at http://www.gwk-bonn.de/fileadmin/Papers/GWK-Heft-42-PFI-Monitoring-Bericht-2015.pdf (Accessed 20 December 2016).	
Q.1.5. Which **recent reforms** to institutions that are in charge of priority setting, budget allocations, and evaluations of HEIs and PRIs were particularly important?	Pact for Research and Innovation (2005); Pact for Higher Education (2007); Initiative for Excellence (2007) The Initiative for Excellence provided around 4.6 billion EUR funding for research excellence for selected HEIs. The projects funded include graduate schools and clusters of research excellence at HEIs. An evaluation study by an independent international scientific committee in 2014 suggests that the effects of the initiative on research outcomes have been positive. Those clusters of excellence that were funded produced research of high impact. However, the additionally effects were not studied. In terms of governance, the initiative supported a stronger differentiation between universities. The Initiative for Excellence showed rather ambiguous effects on teaching (Internationale Expertenkommission Exzellenzinitiative, 2014, p. 2).

References:
Federal Ministry of Education and Research (2016a), Exzellenzinitiative, website (German), Available at http://www.bundesbericht-forschung-innovation.de/de/Exzellenzinitiative-1790.html (accessed 20 December 2016).
Federal Ministry of Education and Research (2016b), Hochschulpakt 2020, website (German), Available at http://www.bundesbericht-forschung-innovation.de/de/Hochschulpakt-2020-1792.html (accessed 20 December 2016).
Federal Ministry of Education and Research (2016c), Pakt für Innovation und Forschung, website (German), Available at https://www.bmbf.de/de/pakt-fuer-forschung-und-innovation-546.html (accessed 20 December 2016).
Internationale Expertenkommission Exzellenzinitiative (2014), Internationale Expertenkommission zur Evaluation der Exzellenzinitiative: Endbericht, Institut für Innovation und Technik, Berlin, p. 2, Available at: https://www.uni-heidelberg.de/md/journal/2016/02/endbericht_internationale_expertenkommission_exzellenzinitiative.pdf (Accessed 17 January 2017).

Topic 2: Policy co-ordination mechanisms

Table 2. Questions on research and innovation councils

Question	Response
Q.2.1. a) Is there a **Research and Innovation Council**, i.e. non-temporary public body that takes decisions concerning HEI and PRI policy, and that has explicit mandates by law or in its statutes to either? – provide policy advice (i.e. produce reports); – and/or oversee policy evaluation; – and/or coordinate policy areas relevant to public research (e.g. across ministries and agencies); – and/or set policy priorities (i.e. strategy development, policy guidelines); – and/or joint policy planning (e.g. joint cross-ministry preparation of budgetary allocations)? b) What is the name of the main research and/or innovation Council/Committee? Are there any other research Councils/Committees? c) Are there any other research Councils/Committees?	a and b) Germany has three main research and innovation councils: The Innovation Dialogue, the Council of Science and Humanities, and the Expert Commission for Research and Innovation *Innovation Dialogue* The Innovation Dialogue was established in 2010 and provides independent policy advice on framework conditions for research, science and technological development. *Expert Commission for Research and Innovation* The Expert Commission for Research and Innovation was created in 2007. The Council is responsible for policy coordination, drafting national strategies in the field of innovation policies, policy advice and policy evaluation. *Council of Science and Humanities* The Council of Science and Humanities was founded in 1957. Its mandate includes policy coordination within government, policy advice to government, preparation of strategic priorities, and evaluation of policy implementation. c) Other councils are the Joint Science Conference (Gemeinsame Wissenschaftskonferenz, GWK) and the Committee of the Federal Government and the Federal States for Research and Technology (Bund-Länder-Ausschuss Forschung und Technologie)

References:
Schwaag, S., Wise, E., and Arnold, E. (2015), National Research and Innovation Councils as an Instrument of Innovation Governance: Characteristics and Challenges, Vinnova Analysis VA 2015:07, VINNOVA, Stockholm, Sweden, Available at: http://www.vinnova.se/upload/EPiStorePDF/va_15_07T.pdf (Accessed 13 January 2017).

Q.2.2. With reference to Q.2.1, does the Council's **mandate** explicitly include a) policy coordination; b) preparation of strategic priorities; c) decision-making on budgetary allocations; d) evaluation of policies' implementation (including their enforcement); e) and provision of policy advice?	a to e) *Innovation Dialogue* The Innovation Dialogue provides independent policy advice on framework conditions for research, science and technological development. The council is responsible for policy coordination between the German Chancellery, the Ministry of Education and Research and the Ministry of Economy and Energy with particular focus on linking innovation to information and communication technologies (ICT) and digitalization. *Expert Commission for Research and Innovation* The Expert Commission for Research and Innovation's mandate is to provide the government with policy advice and evaluation of research and innovation policy. A key task is to provide a comprehensive analysis of the strengths and weaknesses of the German innovation system in an international comparison. The Commission reports directly to the Chancellor Angela Merkel. *Council of Science and Humanities* The Council of Science and Humanities provides policy advice to the Federal government and the Federal state governments on higher education and research policy. It further evaluates policies with regard to scientific institutions (universities, universities of applied sciences and non-university research institutions), especially their structure and performance, development and financing. It coordinates across independent experts from academia and policy actors. It is an important instrument of cooperative federalism including both representatives from the Federal government and the Federal states, maintaining a continuous dialogue between the scientific community and policymakers on central issues concerning the science system.
Q.2.3. With reference to Q.2.1, **who formally participates** in the Council? a) Head of State, b) ministers, c) government officials (civil servants and other representatives of ministries, agencies and implementing bodies), d) funding agency representatives, e) local and regional government representatives, f) HEI representatives, g) PRI representatives, h) private sector, i) civil society, and/or j) foreign experts	a to j) *Innovation Dialogue* The Innovation Dialogue consists of the Chancellor, the Minister of Education and Research, the Minister of Economy and Energy, the Chief of Staff of the German Chancellery and Minister of Special Affairs, high-level representatives from industry, academia, research institutes and labour unions, as well as independent experts. *Expert Commission for Research and Innovation* The Expert Commission for Research and Innovation consists of independent experts from academia, including foreign experts. They report directly to the German Chancellor. The experts may not belong to government or a legislative body at national or federal level; they may not be representatives of industry associations, labour unions or employer organisations. *Council of Science and Humanities* The Council of Science and Humanities' members are academics and government representatives (from federal and state governments) at state secretary level, and representatives of civil society.

Q.2.4. With reference to Q.2.1.b., does the Council have its own a) **staff** and/or its own b) **budget**? If so, please indicate the number of staff and the amount of annual budget available. c) From 2005-16, were any **reforms** made to the mandate of the Council, its functions, the composition of the Council, the budget and/or the Council's secretariat? Was the Council created during the time period?	a and b) *Innovation Dialogue* The Innovation Dialogue has a secretariat that consists of a staff of four people. It is funded by the Ministry of Education and Research. *Expert Commission for Research and Innovation* The Expert Commission for Research and Innovation has its own staff. In 2016, it had a yearly budget of USD 608,000 (EUR 550,000) allocated by the Ministry of Education and Research. *Council of Science and Humanities* The Council of Science and Humanities has its own staff. It is jointly funded by the Federal Government and the governments of the 16 Federal states. c) *Changes over 2005-2016* The Expert Commission for Research and Innovation was established in 2007 and the Innovation Council was established in 2010. The co-existence of the Innovation Dialogue, the Expert Commission for Research and Innovation, and the Council of Science and Humanities – in addition to several other councils – creates a complex system of consultation, coordination and advice. The specialised mechanisms for policy coordination, i.e. the co-existence of numerous expert and high-level councils for policy coordination and evidence-based policy advice distinguish Germany from other countries; this is also reflected in the amount of reReferences allocated for research and innovation councils and the high-level policy representation in councils (e.g. the German Chancellor participates in the Innovation Dialogue) (Schwaag, Wise, and Arnold, 2015, p. 49).

Table 3. Questions on national STI strategies

Question	Response
Q.2.5. a) Is there a national non-sectoral **STI strategy** or plan? b) What is the name of the main national STI strategy or plan?	a and b) The High-Tech Strategy is the main STI strategy in Germany. It was passed in 2006 and revised in 2014 (EC/OECD STI Policy Survey 2016, responses A2 and B1).
References: EC/OECD STI Policy Survey 2016 for Germany. Responses A2 and B1.	
Q.2.6. Does the national STI strategy or plan address any of the following priorities? a) Specific themes and/or **societal challenges** (e.g. Industry 4.0; "green innovation"; health; environment; demographic change and wellbeing; efficient energy; climate action) - Which of the following themes and/or societal challenges are addressed? – Demographic change (i.e. ageing populations, etc.) – Digital economy (e.g. big data, digitalisation, industry 4.0) – Green economy (e.g. natural reReferences, energy, environment, climate change) – Health (e.g. Bioeconomy, life science) – Mobility (e.g. transport, smart integrated transport systems, e-mobility) – Smart cities (e.g. sustainable urban systems urban development) b) Specific **scientific disciplines** and **technologies** (e.g. ICT; nanotechnologies; biotechnology) - Which of the following scientific research, technologies and economic fields are addressed? – Agriculture and agricultural technologies – Energy and energy technologies (e.g. energy storage, environmental technologies) – Health and life sciences (e.g. biotechnology, medical technologies) – ICT (e.g. artificial intelligence, digital platforms, data privacy) – Nanotechnology and advanced manufacturing (e.g. robotics, autonomous systems) c) Specific **regions** (e.g. smart specialisation strategies) d) **Supranational** or transnational objectives set by transnational institutions (for instance related to European Horizon 2020) e) **Quantitative targets** for monitoring and evaluation (e.g. setting as targets a certain level of R&D spending for public research etc.) f) From 2005-16, was any STI strategy introduced or were any changes made existing STI strategies?	a) The High-Tech Strategy addresses societal challenges and makes reference to Horizon 2020 objectives, among others, demographic change, the digital economy, the green economy, health, and mobility. It further addresses innovative work, production and services and civil security (EC/OECD STI Policy Survey 2016, responses A2 and B1). b) The High-Tech Strategy identifies specific scientific, economic and thematic fields to support, including energy and energy technologies, ICT, health and life sciences, and nanotechnology and advanced manufacturing. In detail, the fields addressed are software systems and knowledge technologies (Industry 4.0, Big Data), communication systems, digital technologies, digital media, electronics and electronic systems, new materials, nanotechnology, photonic, human-machine interaction; Bioeconomy, sustainability research, biodiversity, resource efficiency, sustainable agriculture, urban development, energy technologies, nuclear waste management, fusion research; new quality of work (Dialog Arbeiten 4.0), production of the future, services of the future; individualised medicine, preventive medicine; transport infrastructure, automotive technologies, e-mobility, aerospace, maritime technologies; IT security, and defence (Federal Ministry for Education and Science, 2016a). c) With regard to specific regions, a number of Smart Specialisation Strategies are in place addressing "Entrepreneurial Regions"; e.g. Brandenburg, Baden Württemberg, Nordrhein-Westfalen. In Baden Württemberg, for instance, they address ICT, new materials, energy technologies, biotechnology and medicine technology (EC/OECD STI Policy Survey 2016, responses F3; Federal Ministry for Education and Science, 2016b). d) The High-Tech Strategy does not include transnational objectives. e) The High-Tech Strategy includes the quantitative target of increasing gross expenditures on R&D (GERD) to 3% of GDP by 2020 (EC/OECD STI Policy Survey 2016, responses A2 and B1). f) *Changes over 2005-2016* The High-tech Strategy was updated in 2014.

References: EC/OECD STI Policy Survey 2016 for Germany. Responses A2, B1 and F3. Federal Ministry for Education and Science (2016a), Forschungsschwerpunkte, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Forschungsschwerpunkte-1663.html (Accessed 13 January 2017). Federal Ministry for Education and Science (2016b), Das Wissenschaftssystem in Baden-Württemberg, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Baden-Wurttemberg-1673.html (Accessed 13 January 2017)	
Q.2.7. What **reforms** to policy co-ordination regarding STI strategies and plans have had particular impact on public research policy?	High-tech Strategy (2006); Pact for Research and Innovation (Pakt für Forschung und Innovation, 2005) addressing funding of PRIs; Pact for Higher Education (Hochschulpakt, 2007): increase enrolment and graduates in science, technology, engineering and mathematics; Initiative for Excellence (2007): promote cutting-edge research at leading universities.
References: EC/OECD STI Policy Survey 2016 for Germany. Responses A2, B1, B12, C4 and H4.	

Table 4. Questions on inter-agency programming and role of agencies

Question	Response
Q.2.8. Does **inter-agency joint programming** contribute to the co-ordination of HEI and PRI policy? *(Inter-agency joint programming refers to formal arrangements that result in joint action by implementing agencies, such as e.g. sectoral funding programmes or other joint policy instrument initiatives between funding agencies.)*	In the EC/OECD STI Policy Survey 2016, Germany stated that inter-agency programming is not in place.
References: EC/OECD STI Policy Survey 2016 for Germany. Response B6.	
Q.2.9. a) Is co-ordination within the **mandate of agencies**? b) From 2005-16, were any changes made to the mandates of agencies tasked with regards to inter-agency programming? Were new agencies created with the task to coordinate programming during the time period?	a) The DFG as the main public agency supporting research at HEIs and PRIs; it does not provide policy coordination. Policy coordination is mainly done by the Council of Science and Humanities (Wissenschaftsrat), the Joint Science Conference (Gemeinsame Wissenschaftskonferenz), and the Committee of the Federal Government and the Federal States for Research and Technology (Bund-Länder-Ausschuss Forschung und Technologie). b) No major changes made.
References: Federal Ministry for Education and Science (2016), Struktur und Akteure, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Struktur-und-Akteure-1650.html (Accessed 13 January 2017). Deutsche Forschungsgemeinschaft (2016), Mission Statement, website (German), Available at: http://www.dfg.de/en/dfg_profile/mission/index.html (Accessed 13 January 2017).	
Q.2.10. What **reforms** of the institutional context have had impacts on public research policy?	No major reforms made,

Topic 3: Stakeholders consultation and institutional autonomy

Table 5. Questions on stakeholder consultation

Question	Response
Q.3.1. a) Do the following stakeholders participate as formal members in **Research and Innovation Councils**? *(i.e. Formal membership as provided by statutes of Council)* – Private Sector – Civil society (citizens/ NGOs/ foundations) – HEIs/PRIs and/or their associations b) Do stakeholders participate as formal members in **council/governing boards of HEIs**? *(i.e. Formal membership as provided by statutes of Council)* – Private Sector – Civil society (citizens/ NGOs/ foundations)	a) *Innovation Dialogue* The Innovation Dialogue consists of the Chancellor, the Minister of Education and Research, the Minister of Economy and Energy, the Chief of Staff of the German Chancellery and Minister of Special Affairs, high-level representatives from industry, academia, research institutes and labour unions, as well as independent experts. *Expert Commission for Research and Innovation* The Expert Commission for Research and Innovation consists of independent experts from academia, including foreign experts. They report directly to the German Chancellor. *The Council of Science and Humanities* The Council of Science and Humanities' members are academics, government representatives (from federal and state governments) at state secretary level, and representatives of civil society. b) Regarding stakeholders in governing boards or councils of HEIs, differences exist between the Federal states. *Brandenburg* In Brandenburg, for instance, external stakeholders are not represented in university councils. *Baden Württemberg* In Baden Württemberg, external stakeholders are appointed by the State Ministry of Science, Research, and the Arts. The Council of the University Freiburg includes the following stakeholders: Private large firms (Boehringer Ingelheim GmbH, Weil Engineering GmbH, Alfred Ritter GmbH & Co. KG), funding agencies (DFG, German Academic Exchange Service – Deutscher Akademischer Austauschdienst, DAAD), civil society (broadcaster WDR/ARTE); the Council of the University Heidelberg includes the following stakeholders: Private large firms (B. Braun Melsungen AG, BASF) civil society (Jewish Community of Frankfurt, Expert Council of German Foundations on Integration and Migration). *North Rhine-Westphalia* In North Rhine-Westphalia, external members are appointed by a special selection committee which comprises representatives of the university, the board itself and the state ministry. The Board of Governors of the RWTH Aachen University includes the following external stakeholders: Private large firms (Daimler AG, Siemens AG), funding agencies (DAAD); The Advisory Board of the University Bonn consists of the following external stakeholders: Private large firms (Deutsche Post AG), funding agencies (DFG), other public bodies (Federal Court of Auditors, Landschaftsverband Rheinland), civil society (broadcaster WDR, Tonhalle Orchestra Zurich).

References: RWTH University Aachen (2016), Board of Governors, website, Available at https://www.rwth-aachen.de/cms/root/Die-RWTH/Einrichtungen/Organisation/~pwn/Hochschulrat/lidx/1/ (accessed 20 December 2016). Schwaag, S., Wise, E., and Arnold, E. (2015), National Research and Innovation Councils as an Instrument of Innovation Governance: Characteristics and Challenges, Vinnova Analysis VA 2015:07, VINNOVA, Stockholm, Sweden, Available at: http://www.vinnova.se/upload/EPiStorePDF/va_15_07T.pdf (Accessed 13 January 2017). University Bonn (2016), Member of the Advisory Board, website, Available at https://www.uni-bonn.de/institutions/university-council/members (accessed 20 December 2016). University Freiburg (2016), University Council, website, Available at https://www.uni-freiburg.de/universitaet-en/zentrale-universitaere-gremien-en/der-universitaetsrat (accessed 20 December 2016). University Heidelberg (2016), University Council, website (German), Available at http://www.uni-heidelberg.de/universitaetsrat/ (accessed 20 December 2016).	
Q.3.2. a) Are there **online consultation** platforms in place to request inputs regarding HEI and PRI policy? b) Which aspects do these online platforms address (e.g. e.g. open data, open science)? c) From 2005-16, were any reforms made to widen inclusion of stakeholders and/or to improve consultations, including online platforms?	a and b) Platforms for online consultation are not in place. c) No major changes made.
Q.3.3. Which **reforms** to consultation processes have proven particularly important?	No major reforms made.

Table 6. Questions on autonomy of universities and PRIs

Question	Response
Q.3.4. Who decides about **allocations of institutional block funding** for teaching, research and innovation activities at a) HEIs and b) PRIs? *(National/regional level: If HEIs face national constraints on using block funds, i.e. funds cannot be moved between categories such as teaching, research, infrastructure, operational costs, etc. This option also applies if the ministry pre-allocates budgets for universities to cost items, and HEIs are unable to distribute their funds between these.* *Institutions themselves: If HEIs are entirely free to use their block grants.)*	a and b) In Germany, HEIs (Estermann et al., 2015) and PRIs (Federal Ministry of Education and Research, 2016a; 2016b) themselves allocate funds internally to teaching, research and innovation. Regarding HEIs, university autonomy reforms starting in 2006 have increased HEIs autonomy in this regard. In North Rhine-Westphalia, for instance, the 2006 University Freedom Act (Hochschulfreiheitsgesetz) enhanced institutional autonomy to encourage institutions to develop distinctive profiles. Since 2014 (Hochschulzukunftsgesetz) HEIs have to define development plans that include how their teaching and research profiles contribute to national STI objectives.

References:

Data on institutional autonomy is based on a survey conducted by the European University Association between 2010 and 2011 across 26 European countries. The answers were provided by Secretaries General of national rectors' conferences and can be found in the report by the European University Association (Estermann et al., 2015).

EC/OECD STI Policy Survey 2016 for Germany. Responses B12 and C6.

Estermann, T., Nokkala, T., and Steinel, M. (2015). University Autonomy in Europe II The Scorecard. Brussels: European University Association, Available at: http://www.eua.be/Libraries/publications/University_Autonomy_in_Europe_II_-_The_Scorecard.pdf?sfvrsn=2, (accessed 19 September 2016).

European University Association (2016). University Autonomy in Europe, website, Available at: http://www.university-autonomy.eu/, (accessed 19 September 2016).

Federal Ministry of Education and Research (2016a), Grundfinanzierung der Forschungseinrichtungen, website (German), Available at: http://www.bundesbericht-forschung-innovation.de/de/Grundfinanzierung-der-Forschungseinrichtungen-1789.html (Accessed 13 January 2017).

Federal Ministry of Education and Research (2016b), Pakt für Innovation und Forschung, website (German), Available at https://www.bmbf.de/de/pakt-fuer-forschung-und-innovation-546.html (accessed 20 December 2016).

Q.3.5. Who decides about **recruitment** of academic staff at a) HEIs and b) PRIs? *(National/regional level: If recruitment needs to be confirmed by an external national/regional authority; if the number of posts is regulated by an external authority; or if candidates require prior accreditation. This option also applies if there are national/regional laws or guidelines regarding the selection procedure or basic qualifications for senior academic staff.* *Institutions themselves: If HEIs are free to hire academic staff. This option also applies to cases where laws or guidelines require the institutions to publish open positions or the composition of the selection committees which are not a constraint on the hiring decision itself.)* Who decides about **salaries** of academic staff at c) HEIs and d) PRIs? *(National/regional level: If salary bands are negotiated with other parties, if national civil servant or public sector status/law applies; or if external authority sets salary bands.* *Institutions themselves: If HEIs are free to set salaries, except minimum wage.)* Who decides about **reassignments** and **promotions** of academic staff at e) HEIs and f) PRIs? *(National/regional level: If promotions are only possible in case of an open post at a higher level; if a promotion committee whose composition is regulated by law has to approve the promotion; if there are requirements on minimum years of service in academia; if automatic promotions apply after certain years in office, or if there are promotion quotas.* *Institutions themselves: If HEIs can promote and reassign staff freely.)*	a) Since reforms starting in 2006, universities are responsible for recruitment of their staff. They can decide how they employ academic staff, e.g. on the basis of short term contracts or long-term fixed contracts. b) PRIs are free to decide about recruitment. c) Salary bands for academic staff at HEIs are prescribed at the national level. d) Regarding PRIs, the 2009 and 2012 Academic Freedom Acts for PRIs (Wissenschaftsfreiheitsgesetz, EC/OECD STI Policy Survey 2016 for Germany, responses B12, C4, and C6) introduced the possibility for PRIs to pay variable salaries. PRIs are still bound by public sector salary bands but they can add a performance-related variable pay scheme to remain international competitive (BMBF, 2009, p. 1). e) With regard to promotions and dismissals at HEIs, academic staff is either civil servants or public sector employees and therefore enjoy special protection from dismissal. In Brandenburg, career advancement for both academic and administrative staff is only possible if a post is available at a higher level. In North Rhine-Westphalia, promotion is automatic and based on the number of years served in the previous position. For those who still hold civil servant status, promotion is based on age. f) PRIs are free to decide about reassignments and promotions of staff.
References: BMBF (2009), Wissenschaftsfreiheitsgesetz, website (German), Available at: https://www.bmbf.de/files/Seiten_aus_120502_barrierefrei_Entwurf_WissFG_Internet.pdf (Accessed 18 January 2017). EC/OECD STI Policy Survey 2016 for Germany. Responses B12, C4, and C6. Estermann, T., Nokkala, T., and Steinel, M. (2015). University Autonomy in Europe II The Scorecard. Brussels: European University Association, Available at: http://www.eua.be/Libraries/publications/University_Autonomy_in_Europe_II_-_The_Scorecard.pdf?sfvrsn=2, (accessed 19 September 2016). European University Association (2016). University Autonomy in Europe, website, Available at: http://www.university-autonomy.eu/, (accessed 19 September 2016).	

Q.3.6. Who decides about the **creation of academic departments** (such as research centres in specific fields) and functional units (e.g. **technology transfer offices**) at a) HEIs and b) PRIs? *(National/regional level: If there are national guidelines or laws on the competencies, names, or governing bodies of internal structures, such as departments or if prior accreditation is required for the opening, closure, restructuring of departments, faculties, technology offices, etc.* *Institutions themselves: If HEIs are free to determine internal structures, including the opening, closure, restructuring of departments, faculties, technology offices, etc.)* Who decides about the creation of legal entities (e.g**. spin-offs**) and **industry partnerships** at c) HEIs and d) PRIs? *(National/regional level: If there are restrictions on legal entities, including opening, closure, and restructuring thereof; if restrictions apply on profit and scope of activity of non-profit organisations, for-profit spin-offs, joint R&D, etc.* *Institutions themselves: If HEIs are free to create non-profit organisations, for-profit spin-offs, joint R&D, etc.)*	a and c) HEIs (Estermann et al., 2015) and PRIs (OECD, 2013, p. 34) themselves decide about internal academic structures and the creation of legal entities (spin-offs) and joint R&D partnership with industry. b and d) Regarding PRIs, the 2009 and 2012 Academic Freedom Acts for PRIs (EC/OECD STI Policy Survey 2016 for Germany, responses B12, C4, and C6) strengthened spin-off activity at PRIs and PRIs shareholding rights in spin-offs (BMBF, 2009, p. 1).
References: BMBF (2009), Wissenschaftsfreiheitsgesetz, website (German), Available at: https://www.bmbf.de/files/Seiten_aus_120502_barrierefrei_Entwurf_WissFG_Internet.pdf (Accessed 18 January 2017). EC/OECD STI Policy Survey 2016 for Germany. Responses B12, C4, and C6. Estermann, T., Nokkala, T., and Steinel, M. (2015). University Autonomy in Europe II The Scorecard. Brussels: European University Association, Available at: http://www.eua.be/Libraries/publications/University_Autonomy_in_Europe_II_-_The_Scorecard.pdf?sfvrsn=2, (accessed 19 September 2016). European University Association (2016). University Autonomy in Europe, website, Available at: http://www.university-autonomy.eu/, (accessed 19 September 2016). OECD (2013), Commercialising Public Research: New Trends and Strategies, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264193321-en	
Q.3.7. Who earns what **share of revenues** stemming from IP (patents, trademarks, design rights, etc.) created from publicly funded research at a) HEIs and b) PRIs? – HEI – Research unit / laboratory within HEI – Researchers c) From 2005-16, were any reforms introduced that affected the institutional autonomy of HEIs and PRIs?	a and b) At HEIs and PRIs, researchers usually receive between 10 and 30% of revenues (Karlsruhe Institute of Technology, 2011). Institutions decide themselves about the final revenue shares as regulated by the Law on Inventions by Employees 2009 (Gesetz über Arbeitnehmererfindungen). c) University autonomy reforms between 2006 and 2016, Academic Freedom Acts (2009 and 2012) introduced changes to university and PRIs autonomy with regard to governance, human resource policies, industry relations and budget. Since 2009, for instance, PRIs can decide about salaries and shares in spin-off themselves.
References: BMBF (2009), Wissenschaftsfreiheitsgesetz, website (German), Available at: https://www.bmbf.de/files/Seiten_aus_120502_barrierefrei_Entwurf_WissFG_Internet.pdf (Accessed 18 January 2017). EC/OECD STI Policy Survey 2016 for Germany. Responses B12, C4, and C6. Federal Ministry of Justice and Consumer Protection (2009), Gesetz über Arbeitnehmererfindungen, website (German), Available at: http://www.gesetze-im-internet.de/bundesrecht/arbnerfg/gesamt.pdf (Accessed 18 January 2017). Karlsuhe Institute of Technology (2011), Intellectual Property Management: Wichtige Informationen für Professoren, Angestellte und Doktoranden, website (German), Available at: http://www.innovation.kit.edu/downloads/Erfinderleitfaden.pdf (Accessed 18 January 2017). OECD (2013), Commercialising Public Research: New Trends and Strategies, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264193321-en	
Q.3.8. Which **reforms** to institutional autonomy have been important to enhance the impacts of public research?	University autonomy reforms between 2006 and 2016, e.g. Baden Württemberg: University funding reform with an increase of institutional funding (2015); Academic Freedom Acts 2009 and 2012 (Wissenschaftsfreiheitsgesetz)

References:
EC/OECD STI Policy Survey 2016 for Germany. Responses B12, C4, and C6.
BMBF (2009), Wissenschaftsfreiheitsgesetz, website (German), Available at: https://www.bmbf.de/files/Seiten_aus_120502_barrierefrei_Entwurf_WissFG_Internet.pdf (Accessed 18 January 2017).
OECD (2013), Commercialising Public Research: New Trends and Strategies, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264193321-en