

Position paper of the German Federal Ministry of Education and Research on research security in light of the *Zeitenwende*

We are experiencing a ***Zeitenwende*** (turning point in history) which is having a wide-ranging impact on our lives. The Russian war of aggression against Ukraine and its serious consequences play a substantial role in this. But our world was already undergoing radical change, with multipolarity, cyber threats and systemic rivalry, particularly with China, all on the rise. All this has significant **consequences** for science and research. The Federal Ministry of Education and Research (BMBF) responded to Russia's attack on Ukraine by suspending all ongoing and planned measures with Russia. At the same time, the BMBF is taking a more critical view of countries like China and Iran.

The *Zeitenwende* requires a **more strategic approach** that dovetails the freedom of science that we cherish with our security policy interests. The Federal Government has created an important framework for this by adopting its **National Security Strategy** and **China Strategy**.

As a first step, the BMBF has drawn up this position paper. In doing so, we have been guided by the concept of research security as defined by the G7 Science Ministers in the Annex to their 2022 Communiqué:

Research security involves the actions that protect our research communities from actors and behaviours that pose economic, strategic, and/or national and international security risks. Particularly relevant are the risks of undue influence, interference, or misappropriation of research; the outright theft of ideas, research outcomes, and intellectual property by states, militaries, and their proxies, as well as by non-state actors and organized criminal activity; and other activities and behaviours that have adverse economic, strategic, and/or national security implications. Risk-targeted research security measures can enhance the foundations of academic freedom, research integrity, open science, transparency, and trusted collaborations for mutual benefit.

The BMBF targets the following **three dimensions** to strengthen research security in Germany.

Firstly, the **existing instruments, structures**

and procedures that are of relevance to research security must be **reviewed** in light of the *Zeitenwende* in terms of whether they still reflect national security interests and, if required, how they can be enhanced to provide effective, risk-appropriate but also proportionate protection.

Secondly, a **broader awareness and knowledge** of the risks and threats that research increasingly faces is to be created and established within the science system. The risks include, in particular, the misuse of research, foreign interference, espionage targeted at staff and above all the leakage of know-how and technologies to other countries.

The BMBF will therefore actively support the review and (further) development of the relevant **guidelines and instruments** by the science community under the latter's responsibility, for example regarding how to deal with security-relevant research or international cooperation – at the level of institutions as well as of researchers involving both incoming and outgoing research mobility. In addition to guidelines, low-threshold, centrally accessible information and support, training and, if appropriate, flanking structures are needed.

Thirdly, there needs to be critical consideration of the – sometimes – strict separation between civilian and military research in Germany so that potential synergies can be leveraged. Countries like Israel or the USA successfully utilize synergies to translate research into technological innovation in a combined civil and military ecosystem. Particularly at a time when international competition for key technologies is determining the future course, the BMBF is seeking to encourage the responsible actors to re-evaluate their policies without any pre-ordained outcome. Furthermore, the BMBF will discuss with other funding providers the extent to which **funding incentives** can be useful to increase cooperation between civilian and military research in appropriate areas.

Such a strategic approach in science and research is the right response to the *Zeitenwende* and the change of thinking that has begun with it. The Federal Government, the *Länder* and the science community must all play their part in this.

With this awareness, the BMBF seeks to complement its previous commitment in this area – for example advisory and support measures, peace and conflict research, and measures to strengthen competence on China – by implementing the non-exhaustive **8 points** set out in this position paper together with the science community and with the involvement of security agencies, the *Länder* and other ministries. The aim is to prevent or significantly lower the risk to national security and the German science system in dealing with security-relevant research and to strengthen security of action in international collaborations.

In this context, we are guided by the following **principles**:

- **The importance of international cooperation:** International collaborations are essential for the international competitiveness of German research and innovation. Even if they involve difficult international partners, international collaborations remain crucial to overcoming the global challenges of our time.
- **The protection of scientific freedom:** Our constitutionally protected freedom of science is one of the main pillars of our liberal democracy and the fundamental basis of international cooperation. The protection of scientific freedom is a prerequisite for the gaining of genuinely new insights and technological progress.
- **Self-regulation:** Academic self-governance is an expression of the constitutionally protected right of the freedom of science and research. We will therefore work closely together with the relevant actors in the science system. The aim is to provide the relevant structures and information to the actors in the science system so that they take responsibility for their own informed decision-making. In this way, we are also

satisfying the principle of subsidiarity.

- **Proportionality:** Building on the guiding principle of “as open as possible, as closed as necessary”, we must ensure that the measures to protect research security are proportionate to the risks and dangers. We also take account of the BMBF’s other research policy objectives and will design research policy measures in such a way that conflicting aims are avoided and synergies are created wherever possible.

Research security aspects will not be equally affected in all research fields. In particular, for the protection of our funding measures we are therefore placing a focus on a risk-oriented approach with different levels of protection which takes account of such aspects as technology readiness levels and the research fields concerned so as not to create any unnecessary hurdles for research and science.

- **Whole-of-government approach:** The breadth of the challenge makes a holistic response at national level necessary through cooperation among the relevant ministries and security agencies. The European and possibly the multilateral dimension (G7) must be considered and involved.
- **Country-independent approach:** The agenda pursues a country-agnostic approach. We generally count on reciprocity in international cooperation.
- **Learning approach:** The individual measures are to be continuously evaluated and enhanced through exchange of experience among all actors within an evidence-based, learning approach.

No.	Description	Rationale
Dimension I: Increasing the efficiency and effectiveness of available instruments, structures and procedures; enhancing and professionalizing self-regulation		
1	Reflection on and, where necessary, revision of the science community's self-regulation instruments in light of the <i>Zeitenwende</i>	
	<p>The instruments of the German science community for dealing with security-relevant questions, in particular the Joint Committee on the Handling of Security-Relevant Research (GA) and the committees for ethics in security-relevant research (KEFs), must contribute efficiently and effectively to meeting the multidimensional challenges in light of the <i>Zeitenwende</i>. For this purpose they will undergo a comprehensive process of reflection and, where necessary, the relevant revision in the near future. The aim is to make existing structures more efficient, for example by trialling and introducing cross-institutional procedures and processes (possibly on a pilot basis) (e.g. through cooperation between research institutions and universities on the control of exports).</p> <p>The actual implementation of this review is to be discussed together with the science community. Possible scenarios range from reflection largely by the science community itself to the commissioning of a study or conducting of stress tests right through to an external evaluation. The central forum for discussion could be the Alliance of Science Organizations in Germany; insofar as a decentralized approach is to be pursued, bilateral discussions with individual science organizations could be held.</p>	<ul style="list-style-type: none"> • <i>In view of the changed geopolitical threats, the existing instruments for self-regulation are increasingly reaching the limits of their effectiveness. The status quo is no longer enough to ensure comprehensive research security.</i> • <i>The first science system actors have reviewed their instruments and taken the first steps to adapt them to the changed geopolitical conditions (Joint Committee on the Handling of Security-Relevant Research of the DFG German Research Foundation and the Leopodina German National Academy of Sciences; also the DFG in relation to its funding instruments). This is a welcome development.</i> • <i>Other actors are also increasingly addressing this issue. For example, the Alliance of Science Organizations is planning to draw up common guidelines for international collaborations.</i> • <i>The BMBF should actively support these steps and in particular seek to ensure as far as possible that these reviews are holistic and coherent, are conducted with the involvement of the relevant security agencies, identify international best practices and assess their transferability to the German science system.</i>
Dimension II: Strengthening knowledge and awareness		
2	Development of common guidelines for research security	
	<p>In order to enhance the sensitivity and self-regulation of the science community with regard to research security-relevant issues and procedures while maintaining the principle of self-administration, the BMBF will support the science community in developing common guidelines for research security as part of the current process being undertaken by the Alliance's organizations.</p>	<ul style="list-style-type: none"> • <i>Because of the importance of the freedom of science, it is up to researchers, universities and science institutions themselves to choose the research goal and the research design and to weigh up the risks of their research in this context. Thus it is all the more important that the science community deals responsibly with this freedom. There is significant variation</i>

		<i>in how different actors in the science community understand, assess and deal with security-relevant research.</i>
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	<p>The subject of common guidelines could be, for example:</p> <ol style="list-style-type: none"> 1. Guidelines for mandatory consideration by researchers of the dual-use relevance of research subjects addressed. They should also examine whether tiered rule systems are useful for different technology readiness levels and research fields. The considerations at EU and international level are to be taken into account. 2. Guidelines for collaborations between German universities/science institutions and international partners, ranging from cooperation in international bodies to the establishment of institutions abroad. 3. Guidelines for all staff of science institutions concerning secrecy obligations in dealing with external staff, particularly with regard to data security. 4. Guidelines for dealing with foreign scholarship-holders and visiting researchers. 5. Guidelines for active and emeritus German researchers concerning cooperation with international partners and work in international bodies, also with regard to civil service law. 6. Guidelines for cooperation between institutions and security agencies, immigration authorities, etc. 7. Guidelines for risk-appropriate regulating control of digital and physical access to institutes, their resources and scientific data by affected institutions on a need-to-know basis in order to avoid unwanted leakage of data and knowledge. 	<ul style="list-style-type: none"> • <i>In 2014, the Joint Committee on the Handling of Security-Relevant Research drew up a catalogue, which it updated in 2022, of key questions for the assessment of security-relevant research by the committees on ethics in security-relevant research (KEFs) established at many institutions. In addition, the DFG recently adopted review and reflection measures for its funding instruments in order to enable researchers to gain an overview of the risks and make it possible to draw conclusions about the appropriateness of carrying out or funding specific projects. At the same time, the Alliance of Science Organizations is planning to draw up common guidelines for international collaborations.</i> • <i>Two countries with whom Germany shares common values – Canada and the Netherlands – have recently drawn up and published national guidelines for research security together with the science community (Netherlands: National knowledge security guidelines, 2022; Canada: National Security Guidelines for Research Partnerships, 2023).</i> • <i>Guidelines will therefore also be drawn up for the German science system which will take these initiatives into account. In this context, a uniform approach for the whole of Germany drawn up together with the science community and the Länder appears desirable, which will balance the general interests of security with the scientific interests of the institutions and researchers. The BMBF sees its role as accompanying the process with constructive support which aims for coherence.</i>

3

Improvement of the information basis for questions of research security; examination of the need for a clearing house

Relevant information and background knowledge on research security are to be made as easily accessible as possible to all researchers and science institutions. This should reduce the effort required to obtain the necessary information and available knowledge should be shared. This could work, for example, by means of a central information platform for questions of research security that compiles databases and other information sources for cases of suspected or high risk (if necessary, in anonymous form). The model for one component of such a platform could be the China Defence Universities Tracker developed by the Australian Strategic Policy Institute (ASPI). Similarly, in January 2024, Canada published a list of foreign institutions with which a collaboration poses a risk to Canada's national security on account of their direct or indirect links to the military, national defence or state security organs.

In this context there is also to be examination of the extent to which possibilities for support which have already been developed and trialled for cooperation with individual countries can be extended to other collaborations. The knowledge base can be further strengthened through, for example, country-specific analyses of threat-posing actors, comparative studies on the research security policies of EU member states and countries sharing the same values as Germany, and research to evaluate the effectiveness of protective measures.

Furthermore, the need is to be examined together with the science community for a central clearing house to serve as an interface between science, ministries and security agencies (cf. the Dutch National Contact Point for Knowledge Security). This can support scientific staff and science institutions in their decision-making in the context of research security and international collaborations. The establishment and operation of the clearing house is to be as unbureaucratic as possible with the possibility of involving the Joint Committee on the Handling of Security-Relevant Research.

- *Researchers and science institutions often lack support with regard to assessing the security relevance of their research, particularly in the context of cooperation with international partners. Specifically, there is a lack of easily accessible guidelines for assessments by researchers, of transparent and efficient advisory and compliance processes of the science institutions, and of blacklists relating to cooperation with foreign science institutions. Researchers want guidance and knowledge that is as specific as possible to provide them with orientation.*

No.	Description	Rationale:
	<p>In addition, there is also to be examination of the establishment of (ideally central) compliance advice offices to advise and support the science institutions in each specific case.</p>	
4	Identification of sensitive technologies; definition of research fields of special interest for the Federal Government	
	<p>Building on the publication of a list of critical technology areas for the EU's economic security by the European Commission (Annex to C(2023) 6689 final of 3.10.2023) and the preliminary work of the interministerial group on emerging technologies, a list of sensitive technologies which are of special interest due, for example, to their potential dual use or their outstanding importance for key sectors of the German economy is to be compiled by the Federal Government. The aim is to work out a common understanding between the different ministries of the research security significance of different technologies and put this into practice in a coherent procedure. This 'living' list will be regularly updated.</p> <p>The list is to serve as an aid to informed review and balanced assessment in individual cases without actually replacing carefully considered decisions in each case which, in view of the complexity of science, remain absolutely essential.</p>	<ul style="list-style-type: none"> • <i>Many institutions base their approach to the question of dual-use relevance in research on the rules controlling the export of goods: the EU Dual-Use Regulation, the German Foreign Trade and Payments Act (Außenwirtschaftsgesetz – AWG) and the German Foreign Trade and Payments Ordinance (Außenwirtschaftsverordnung – AWV). If a good is listed in the annexes to the Dual-Use Regulation, it requires authorization for export to a non-EU country. There are no such concrete rules or points of reference for the examination of dual-use relevance of research work. Furthermore, the export controls do not cover basic scientific research. Moreover, the sectors in the AWV are too broadly defined for use with regard to research.</i> • <i>At the European level, the European Commission has recently published a list of technologies critical for economic security as part of the European Economic Security Strategy. The focus here is on economic concerns; these can, but need not necessarily match the key innovation and science fields of German national research policy. This must be taken into account when drawing up the list.</i>
5	Strengthening the resilience of the science system to information gathering by intelligence services	
	<p>The resilience of the science system to information gathering by foreign intelligence services in particular through human sources and through the compromise and surveillance of digital (communications) infrastructure is to be improved.</p>	<ul style="list-style-type: none"> • <i>In science, direct contacts are made mostly in the context of conferences, joint research projects or exchange programmes. The science community is to be sensitized to the associated risks.</i>

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	<p>For this purpose, those with responsibility in the science system (including scientific, but also technical staff) are to be further sensitized; such awareness-raising can also be the subject of the above-mentioned national guidelines.</p>	<ul style="list-style-type: none"> • <i>Corresponding training activities are to be established by the science institutions.</i> • <i>Collaborative solutions (also involving the use of existing structures at larger institutions) could be sought in particular for small to medium-sized science institutions in order to achieve the most efficient allocation of limited time, money and personnel resources.</i>
6	Creation of transparency concerning any dependencies on the part of science institutions	
	<p>In order to be able to take any necessary countermeasures, the entities responsible for public research institutions and universities need to have knowledge of foreign (third-party) funding and any resulting state of dependency. To this end, funding from third countries is to be disclosed if this exceeds a certain threshold of relevance.</p>	<ul style="list-style-type: none"> • <i>A significant share of the financing of research in the German science system depends on the acquisition of third-party funds. Most third-party funding comes from the Federal Government and the DFG. Smaller shares come from companies, foundations and the EU.</i> • <i>Special attention must be given to third-party funds from foreign funders, because they can provide a gateway for interference and unwanted leakage of know-how and technologies to other countries.</i> • <i>Not disclosing financial links to foreign actors has the potential to undermine trust in research. As a first step, therefore, a transparency requirement is to be established for when predefined limits are exceeded.</i>
Dimension III: Leveraging synergies between civil and military research		
7	Reflection on the appropriateness of civil clauses in the era of the <i>Zeitenwende</i>	
	<p>The possibilities for better integration of military and civil research are to be addressed in a discussion process with the <i>Länder</i> and the Alliance of Science Organizations in Germany / the German Rectors' Conference (HRK). This does not mean that there will be an obligation to conduct research for military purposes.</p> <p>In particular, the process is to involve open-minded discussions about whether the various types of civil clauses are still</p>	<ul style="list-style-type: none"> • <i>Currently two <i>Länder</i> have a civil clause requirement written into their higher education laws. Universities in other <i>Länder</i> have also set themselves civil clauses, often on account of temporarily existing civil clause requirements of the <i>Land</i> funding them. Many university civil clauses use the general formulation "(exclusively) peaceful uses". Others refer more specifically to military or arms-relevant research.</i>

	<p>appropriate in view of the changed geopolitical conditions and how civil clauses can be designed so that they take adequate account of the increasingly difficult differentiation of research in view of multiple possibilities for its use.</p>	<ul style="list-style-type: none"> • <i>Building on the recommendations included in the 2023 annual report of the German Commission of Experts for Research and Innovation (EFI) and in the report published in 2023 by the Scientific Advisory Board at the Federal Economics Ministry entitled “Bundeswehr besser ausrüsten – aber wie?” (Providing better equipment for the Bundeswehr – But how?) and those made by the German National Academy of Science and Engineering (acatech), a discussion process with the Länder and the Alliance of Science Organizations in Germany / the German Rectors’ Conference (HRK) is to assess the extent to which civil clauses are still appropriate or should be revised in light of the Zeitenwende.</i>
<p>8 Strengthening cooperation between civil and military research</p>		
	<p>Exchange and cooperation between civil and military research institutions is to be intensified in order to put knowledge relevant for research security and German research capabilities on a broader footing and to strengthen inter- and transdisciplinary cooperation.</p> <p>The funding instruments available to the Federal Government are to be used for this purpose in areas where this is appropriate. To this end, the BMBF will ask all relevant ministries to examine to what extent a greater emphasis can be placed on collaborative projects between civil and military research institutions in the context of departmental research. (The Interministerial Committee for Science and Research could act as the forum for this.) Furthermore, building on the evaluation of the Bundeswehr Digitalization and Technology Research Centre (dtec.bw) published by the German Science and Humanities Council (Wissenschaftsrat – WR) in July 2023 (“Stellungnahme zum Zentrum für Digitalisierungs- und Technologieforschung der Bundeswehr (dtec.bw)”) there is to be discussion with the Federal Ministry of Defence about opening up its research funding and awarding it on a competitive basis.</p> <p>In addition, the idea of establishing a joint research prize for civil-military research</p>	<ul style="list-style-type: none"> • <i>To date, collaboration between civil and military research has been limited to a few selected fields for reasons of German history. But in the meantime, the geopolitical conditions have changed dramatically. The question of whether this strict separation between civil and military research is still appropriate today can be also be asked in view of the heightened international competition for key technologies. To date, civil researchers in Germany have sometimes shown reluctance in this respect (see the previous point in this regard).</i> • <i>Taking up the recommendations included in the 2023 and 2024 annual reports of the EFI and in the 2023 report by the Scientific Advisory Board at the Federal Economics Ministry (Providing better equipment for the Bundeswehr – But how?) and those made by acatech, this reluctance is to be countered by the funding of concrete civil and military research collaborations. Formats such as “Common Effort & Training” (under the leadership of the Federal Ministry of Defence) already address civil-military cooperation. In this way, this also contributes towards the topic of “civil defence” (lead: Federal Ministry of the Interior) which is gaining relevance both nationally and internationally as well as</i>

<p>could be explored, possibly also sponsored by a civil-society actor (e.g. a foundation). With a view to establishing additional institutional structures, a (further) look should be taken at the replicability of the United States' Defense Advanced Research Projects Agency (DARPA) and Defense Innovation Unit (DIU) in the German science system.</p>	<p><i>to the goal of enhancing resilience as agreed at the NATO summit in mid-2023.</i></p>
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