

Transfer Strategy of Brandenburg

Improving cooperation
between science,
industry, politics and
civil society



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Summary

The state government adopted the Transfer Strategy of Brandenburg on September 5, 2017. This laid the strategic foundation to further strengthen the transfer of knowledge and technology in the state of Brandenburg.

The strategy is to ensure the best possible conditions for strengthening knowledge and technology transfer long-term through the cooperation of science with business, politics and civil society in Brandenburg. The Transfer Strategy of Brandenburg focuses on nourishing universities in their institutional role as partners for transfer. It also addresses external research institutions, that make an important contribution to the county's development as well.

The Transfer Strategy of Brandenburg complements the state's strategy for regional innovation. It also represents a strategic building block in conjunction with other policies of the state, such as the Startup and Business Succession Strategy, the strategy to foster skilled labour as well as Brandenburg's Sustainability Strategy.

The Transfer Strategy has four objectives, *one* is to recognise the importance of research institutions in regional development, *second*, to strengthen a culture of transfer, particularly of knowledge, within scientific institutions, *third*, to improve the performance of scientific institutions, specifically for regional development in business, politics and civil society, and *fourth*, to optimise transfer policies and regulations. Therefore, the Transfer Strategy's focus is on the following three fields of action:

- (1) Optimising structures for transfer
- (2) Improving transparency, cooperation and communication
- (3) Adapting and optimising funding policies for transfer

Looking at the initial situation of Brandenburg and its small-scale economic structure, it is apparent that scientific institutions are particularly important for regional development. Universities and research institutions in Brandenburg already exhibit significant transfer activities into the industry. At the same time, the exchange with politics and civil society plays an increasingly important role. To illustrate their range, the Transfer Strategy lists several examples of transfer activities of scientific institutions.

The state government has various measures at their disposal to promote transfer (in particular the ministries MWFK, MWE and MASGF). The Ministry of Science, Research and Cultural Affairs (MWFK) pooled all its transfer-related measures in the 'Brandenburg Transfer Offensive' in 2015. Significant new measures in 2015/16 included the event series 'Transfer Offensive on Site' and the 'Transfer Audit' sessions at all universities. Findings from both these initiatives laid a crucial foundation for developing the Transfer Strategy of Brandenburg.

A broader understanding of transfer is fundamental to the Transfer Strategy of Brandenburg. According to this understanding, both knowledge and technology transfer is a discursive process through which scientific findings, services and technologies are conveyed, exchanged, applied and developed further in projects and with people. This requires close interaction between universities and research institutions and players from the industry (SMEs particularly), politics and civil society, ministries of the state as well as intermediaries (i.e. WFBB or the business promotion bank ILB).

The expanded transfer concept spans the dimensions of *communication of knowledge generated through research*, *scientific consultation*, and the *application of science*. Based on the broader understanding of transfer, each scientific institution can establish a specific transfer profile and emphasise different priorities in their transfer activities respectively. An example in form of a radar chart is included to show how such a transfer profile may look like.

Overall, the broader understanding of transfer shall make research-based knowledge accessible and applicable to all sections of society.

The Transfer Strategy details the planned measures with regards to the three fields of action. These range from securing skilled labour by better integrating university graduates into the region over improving scientific institutions' communications to hiring scientific staff for transfer tasks as well as direct support in order to strengthen transfer.



Members of the Brandenburg state government with representatives of universities and other research institutions, cabinet meeting on September, 5, 2017 at the University of Potsdam

In a first step, measures already defined in the various fields of action of the Transfer Strategy will be implemented by and with the various transfer partners. At the same time, evaluations called for in the strategy will be carried out.

With the broader understanding of transfer, the success of transfer activities can no longer be evaluated based on classic indicators such as third-party funds and spin-offs alone. Hence, the MWFK will work together with other participating ministries, universities and external research institutions to broaden criteria for success of transfer activities accordingly.

After four years, progress made in implementing these measures will be evaluated.

1. Introduction

The government of the State of Brandenburg aims to further strengthen the transfer of knowledge and technology during its sixth parliamentary term. As stated in the coalition agreement:¹ “Universities and research institutions shall cooperate more closely in order to qualify research and teaching further. In addition, they shall work more closely with companies to secure competitive advantages and jobs. The coalition stands for integrated policies of science, innovation and economics.”

A well working innovation system with a successful transfer of knowledge and technology established through effective and efficient exchanges between science, business, politics and civil society, is a key factor for prosperity and employment. In recent years, universities and research institutions have intensified their cooperation outside of science in order to advance the society’s development based on knowledge and to meet the higher expectations of politics and society for science. For these developments to unfold, appropriate regulations and subsidy policies must be put in place.²

Science and research form both the basis of knowledge acquisition and the cornerstones of Brandenburg’s strength: they are a crucial factor in the region’s sustainable development. As a modern, innovative and industrial state, Brandenburg relies on the strength of its scientific institutions and their close networks in the region in order to succeed in the national and international competition for ideas, products and applications.

The Transfer Strategy of Brandenburg aims to ensure the best possible science policies to strengthen knowledge and technology transfer through the cooperation between science and industry, politics and civil society in Brandenburg long-term. It focuses on nourishing universities as institutions in their role as partners for



Transfer Offensive on Site series at the University of Potsdam

transfer. It also addresses external research institutions, which greatly contribute to the region’s development as well³. Here, different institutional structures and scientific priorities must be taken into account.⁴ The Transfer Strategy factors in both the structures and structural conditions specific to Brandenburg.

1 Coalition Agreement for 6th parliamentary term, p. 31; 10.10.2014.

2 Position paper of the German Council of Science and Humanities (“Wissenschaftsrat”), “Knowledge and Technology Transfer as Institutional Strategy”, 2016; available in German www.wissenschaftsrat.de/download/archiv/5665-16.pdf.

3 External research institutions of supraregional importance and state-wide interest according to article 91b Germany’s Basic Law, will be supported institutionally with specific financing ratios. Joint funding through the state as well as the federal administration is received in particular by large scientific and research organisations such as Helmholtz Association, Max Planck Society and Fraunhofer Society, all of which are separate legal entities as registered associations (e.V.). Furthermore, member institutions of the Leibniz Association are included despite them being non-profit organisations.

4 Due to its federal constitution, the German research and development system is characterised by a diverse structure with various actors, in particular universities, research institutions and companies as well as a broad spectrum of research areas. This enables a high degree of specialization in core areas. See “Bundesbericht Forschung und Innovation” 2016, p. 51 by the Federal Ministry of Education and Research (BMBF); in German www.bundesbericht-forschung-innovation.de/.



The present Transfer Strategy complements the state's Regional Innovation Strategy⁵, which focuses on supporting companies and key players in fields with potential for growth in Brandenburg. These are organised in clusters created to ultimately foster the power of innovation. At the same time, the Transfer Strategy forms a strategic building block of other policies such as the Startup and Business Succession Strategy⁶, the government's Strategy for Skilled Labour⁷ as well as the Sustainability Strategy for Brandenburg.⁸

As key players, universities as well as external research institutions in Brandenburg were involved in developing the Transfer Strategy.

5 Joint Innovation Strategy of the States of Berlin and Brandenburg (innoBB), www.innobb.de/sites/default/files/joint-innovation-strategy-of-the-states-berlin-and-brandenburg-innobb-1069.pdf.

6 GUS "Startup and business succession strategy", available in German www.mwe.brandenburg.de

7 BIF "Brandenburg Innovation Experts", available in German www.masgf.brandenburg.de.

8 LNHS "Sustainability strategy Brandenburg", available in German www.mlul.brandenburg.de.

2. Objectives and content of the Transfer Strategy



Reflecting telescope from 1913 in the historical observatory at the Leibniz Institute für Astrophysics Potsdam

In implementing the mandate set out in the coalition agreement and based on the initial situation described in Chapter 3 with the need for action deriving from it, the Transfer Strategy of Brandenburg aims to achieve the following objectives:

- (1) Recognizing the importance of research institutions in regional development,
- (2) strengthening a culture of transfer, particularly of knowledge within scientific institutions,
- (3) improving the performance of scientific institutions, specifically for regional development in business, politics and civil society,
- (4) optimising transfer policies and regulations.

Achieving these objectives requires a broader understanding of transfer such as described in Chapter 4 and that will be applied in future. The Transfer Strategy focuses on three fields of action:

1. Optimising structures for transfer
2. Improving transparency, cooperation and communication
3. Adapting and optimising funding policies for transfer

Chapter 5 details these fields of action by outlining the activities and measures planned. They shall help to strengthen the conditions for transfer for the universities as well as for the external research institutions as key players in the transfer process.

3. Initial situation in Brandenburg

The State of Brandenburg is characterised by a small-scale economic structure: 99.8% of all enterprises classify as small and medium-sized enterprises (SMEs); these account for 82.6% of employment covered by social insurance⁹. SMEs especially have limited capacities for their own research and development (R&D) and face particular challenges when it comes to digitization. Cooperation with science allows them to access the relevant scientific knowledge they require. The following considerations must be taking into account that – apart from relating on topics – proximity to scientific institutions is a key factor for transfer activities of SMEs due to their limited resources. In this context, Brandenburg's scientific institutions play a very significant role when it comes to innovation in their immediate vicinity and ultimately to regional development.

Brandenburg counts three universities, one film university and four universities of applied sciences, or technical colleges, that make up its higher education sector.¹⁰ Moreover, Brandenburg has a successful research landscape on both the national and international scale, characterised by scientific quality, diversity and

Started by the Leibniz Research Alliance „Food and Nutrition“, the innovative „Initiative Agriculture 4.0“ has been developed together with ATB, IHP, ZALF, DIfE, IGZ and PIK as partners. They aim to link social interests as well as demands on quality of agricultural products from society and consumers directly with the means of production.

www.leibniz-lebensmittel-und-ernaehrung.de/en/knowledge-transfer/archive/2016/statement-paper-of-initiative-agriculture-40/

performance. Brandenburg is home to three institutes of the Max Planck Society (MPG), four institutes or branch offices of the Helmholtz Association (HGF), ten institutes or locations of the Leibniz Association, two institutions and a working group of the Fraunhofer Society and a number of other research institutes.¹¹ Also Berlin has a distinct research landscape with a high concentration of universities and research institutions.¹² This provides Brandenburg's economy with a wide range of potential partners for cooperation.

Universities and research institutions in Brandenburg already show significant transfer into the economy. A diverse range of offers to promote startups and cooperation with the industry has emerged and grown. Third-party funding through local businesses has essentially remained constant in recent years.

Transfer activities of scientific institutions for the region, which go beyond direct cooperation projects with companies, have not been considered in statistics to date. Also, they are not yet apparent enough to the wider public. This particularly applies to social innovations applicable to civil society.



Minister Martina Münch during the Transfer Offensive on Site series at Brandenburg University of Technology Cottbus-Senftenberg (BTU)

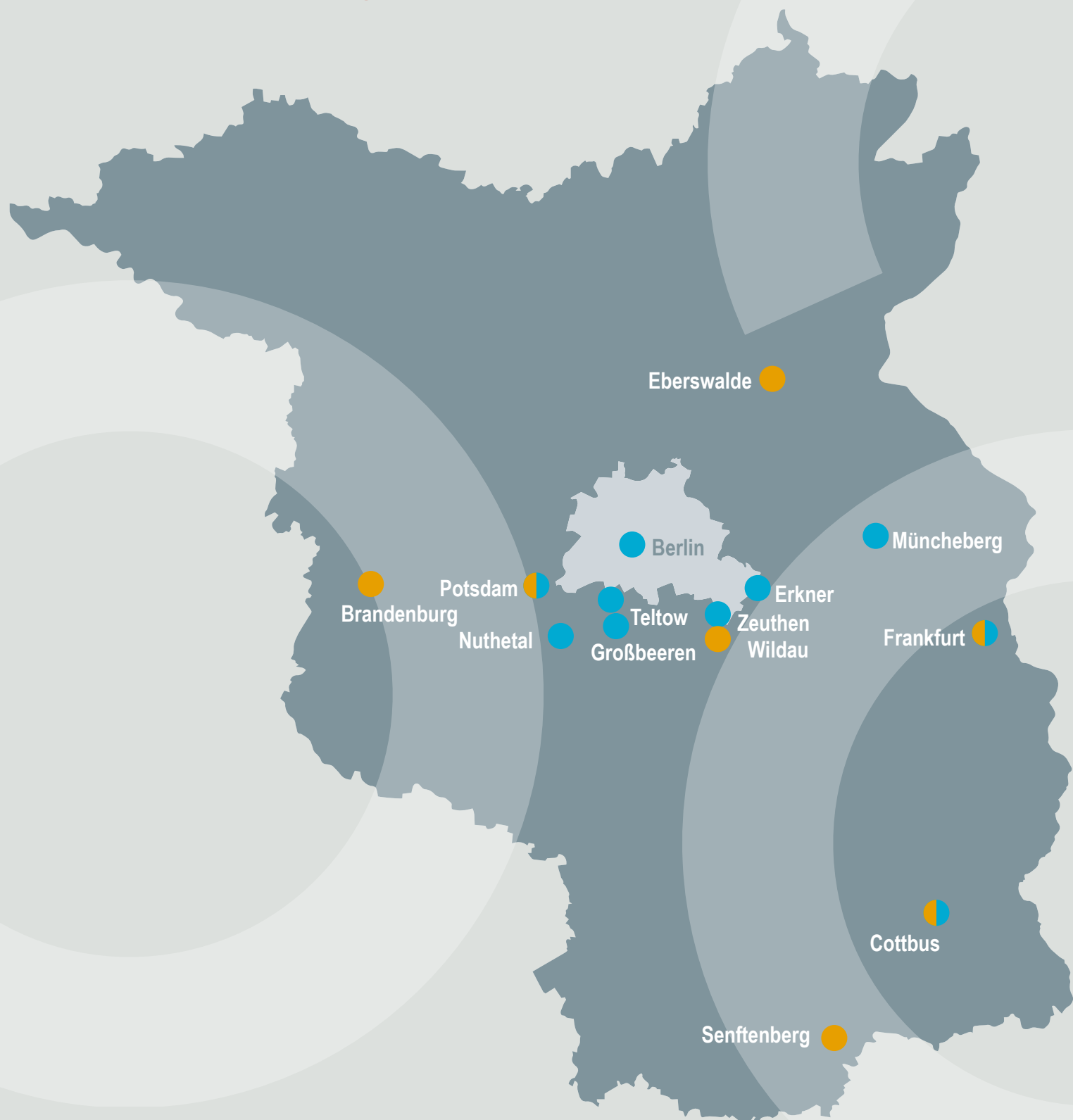
⁹ www.statistik-berlin-brandenburg.de/produkte/faltblatt_brochure/FB_Unternehmen_DE_2015_BB.pdf (in German).

¹⁰ Overview in German: www.mwfk.brandenburg.de.

¹¹ See footnote 10.

¹² Overview in German: www.berlin-sciences.com/wissenschaftsstandort-berlin.

State of Brandenburg



Public
Universities



External Research
Institutions



Public Universities

Brandenburg University of Technology Cottbus-Senftenberg (BTU)

www.b-tu.de

European University Viadrina (EUV)

www.europa-uni.de

University of Applied Sciences Potsdam (FHP)

www.fh-potsdam.de

Film University Babelsberg Konrad Wolf (FBKW)

www.filmuniversitaet.de

Eberswalde University for Sustainable Development (HNEE)

www.hnee.de

Brandenburg University of Applied Sciences (THB)

www.th-brandenburg.de

Technical University of Applied Sciences Wildau (THWi)

www.th-wildau.de

University of Potsdam (UP)

www.uni-potsdam.de



External Research Institutions

Alfred Wegner Institute | Helmholtz centre for polar and marine research (AWI)

www.awi.de

Berlin-Brandenburg Academy of Sciences and Humanities (BBAW)

www.bbaw.de

“Deutsches Elektronen-Synchrotron” (German accelerator centre) (DESY)

www.desy.de

German Institute of Human Nutrition Potsdam-Rehbruecke (DIfE)

www.dife.de

Fraunhofer Institute for Applied Polymer Research (IAP)

www.iap.fraunhofer.de

Fraunhofer Institute for Cell Therapy and Immunology – Dept. of Bioanalytics and Bioprocesses (IZI-BB)

www.izi.fraunhofer.de

Fraunhofer Institute for Photonic Microsystems – Dept. of Integrated Silicon Systems (IPMS-ISS)

www.ipms.fraunhofer.de

German Research Centre for Geosciences (GFZ)

www.gfz-potsdam.de

Helmholtz-Zentrum Geesthacht | Centre for Materials and Coastal Research (HZG)

www.hzg.de

Leibniz Institute Innovations | High Performance Microelectronics (IHP)

www.ihp-microelectronics.com

Institute for Advanced Sustainability Studies (IASS)

www.iass-potsdam.de

Leibniz Centre for Agricultural Landscape Research (ZALF)

www.zalf.de

Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB)

www.atb-potsdam.de

Leibniz Institute for Astrophysics Potsdam (AIP)

www.aip.de

Leibniz Institute of Vegetable and Ornamental Crops (IGZ)

www.igzev.de

Leibniz Institute for Research on Society and Space (IRS)

www.leibniz-irs.de

Max Planck Institute for Gravitational Physics (Albert Einstein Institute) (MPI-AEI)

www.aei.mpg.de

Max Planck Institute of Colloids and Interfaces (MPI-KG)

www.mpikg.mpg.de

Max Planck Institute of Molecular Plant Physiology (MPI-MP)

www.mpimp-golm.mpg.de

Potsdam Institute for Climate Impact Research (PIK)

www.pik-potsdam.de

Senckenberg German Entomological Institute (SDEI)

www.senckenberg.de

Centre for Contemporary History (ZZF)

www.zzf-potsdam.de

The majority of Brandenburg's universities emerged or were reactivated during the early nineties after Germany's reunification, some having an older tradition. The young universities' founding mandate and consequently the range of subjects and self-proclaimed image follow specific profiles, that are to varying degrees compatible with the regional economic structure. Accordingly, different universities have different thematic priorities for transfer. Here follow a few examples that reflect the diversity and range of the current transfer spectrum in Brandenburg:

→ **University for Sustainable Development Eberswalde (HNEE) closely works with Brandenburg's organic farming businesses and food economy.**

The network „InnoForum Ökolandbau Brandenburg“ (German for: organic farming Brandenburg) has grown over years and is coordinated by the HNEE. Apart from joint events such as summer courses, excursions etc., the partners work in research cooperation and ask questions emerging from real-life.

www.innoforum-brandenburg.de (in German)

→ **Cooperation with media companies is important for the Film University Babelsberg Konrad Wolf.**

dwerft is a collaborative IT research project for film and TV technologies and is led by the Film University together with the Hasso Plattner Institute and nine more companies.

www.filmuniversitaet.de/de/forschung/schwerpunkte-projekte/4-technologische-entwicklung/dwerft.html (in German)

→ **The European University Viadrina is working closely with partners in Poland.**

European University Viadrina is part of a network of German and Polish business development agencies working to turn Frankfurt (Oder) into a transnational logistics hub.

www.europa-uni.de/de/struktur/verwaltung/transfer-stelle (in German)

→ **But also transfer into society is taking an ever more prominent role.**

In so-called *Open Collaborative Innovation* processes, citizens take part in activities of the THWi as they form a citizen panel.

www.th-wildau.de/forschungsgruppen/fg-innovation/projekte/buergerpanel.html

First steps have been taken to further develop and optimise transfer activities and structures in higher education. Hence this topic is part of all university contracts for the 2014–2018 term. Moreover, the state awards universities with about 3.6 million euros annually, labelled as “third-party funds from the commercial sector” according to the new allocation model adopted in 2015. This provided an additional financial incentive to step up cooperation with the business community.

Transfer at external research institutions

Knowledge and technology transfer are at the core of the strategy of the four non-university research institutions mentioned previously. Accordingly transfer is embedded in their strategy, mission or position statements and included in the research institutions' statements regarding the continuation of the PFI in third iteration (German for: Pact for Research and Innovation). Therein is agreed that research organisations will continuously further their specific knowledge and technology transfer activities based on their general transfer strategies.



“InnoForum Ökolandbau Brandenburg” (German for: organic farming) at University for Sustainable Development Eberswalde (HNEE)



Open Collaborative Innovation processes at Technical University of Applied Sciences Wildau (THWi)

Progress being made is part of the pact's¹³ annual monitoring report. The Fraunhofer Society, which attracts the highest share of external funding from the business sector due to its mission, managed to increase this income again in 2016. Also in global rankings of innovative companies and research institutions, the research organisations, in particular Fraunhofer Society, again held top positions in 2016¹⁴.

Fraunhofer IAP and its competence centre for energy- and resource-efficient lightweight construction in the Berlin-Brandenburg region is available as a partner for businesses in all areas of lightweight construction based on polymers. Brandenburg-based SMEs can thus create value chains and expand their position in the market through innovations.

www.iap.fraunhofer.de/en/for_clients.html
www.iap.fraunhofer.de/en/fraunhofer-iap.html

The transfer of knowledge and technology and the exchange of findings from research with society is one goal of the PFI III policy by the Federal Government and the states ("Länder"). It has also gained importance in Brandenburg's research institutions in recent years. Both universities as well as other research organisations in the State of Brandenburg have developed and implemented a whole series of measures and innovative formats in

this regard. They aim to promote young scientists and to encourage interest and enthusiasm for science and research in children and young people.

DESY through its *School Lab in Zeuthen* not only furthers the education and qualification of young people, but also regards the professional development of teachers through knowledge transfer a significant contribution to the promotion and recruitment of young talent, or junior staff.

www.physik-begreifen-zeuthen.desy.de/index_eng.html

With their *Starry Night in Babelsberg series*, the AIP regularly organises observations of the night sky through its reflector telescopes at their historical observatory built in 1913.

www.aip.de/en/calendar/public-events?

With their *online portal* called Contemporary History Digital, the ZZF develops its own digital research infrastructure for contemporary history. It has advanced to one of the most important online sources for such data.

www.zzf-potsdam.de/en/zeitgeschichte-digital

¹³ www.gwk-bonn.de/themen/wissenschaftspakte/pakt-fuer-forschung-und-innovation.

¹⁴ PFI „Pact for research and innovation“: Monitoring report 2017, p. 13 with further references; in German.



School Lab at DESY in Zeuthen

The state government's promotion of transfer

The MWFK supports transfer activities indirectly as part of university funding policies and university contracts as well as through two European Regional Development Fund (ERDF) programmes: StaF, that aims to foster scientific research in technology and its application, and InfraFEI, a scheme promoting research, development and innovation.

Locations for research have been fostered systematically recently, in particular through investing in research infrastructures as a basis for innovative research results. Examples are the completion of the third stage of expansion of the biomedical engineering unit of Helmholtz-Zentrum Geesthacht's Teltow outlet as well as the expansion of the research and innovation location Wildau, and lastly the Fraunhofer Conference Center in Potsdam-Golm, which is jointly used by Fraunhofer IAP and the department of Fraunhofer IZI based in Potsdam. Moreover, successful cooperation between research institutions and universities based on location, or co-location rather, such as the extensive expansion of the so-called Science Campus Nutrition by the German Institute of Human Nutrition (DIfE) and the University of Potsdam in Potsdam-Rehbrücke are being promoted.

The Brandenburg Ministry for Economic Affairs and Energy (MWE) supports the transfer offices at universities as well as individual transfer projects dealing with specific topics. Examples are the Innovation Center of Modern Industry in Brandenburg (IMI) supported by the Brandenburg University of Technology (BTU) and the competence centre for energy- and resource-efficient lightweight construction at the Fraunhofer Institute for Applied Polymer Research (IAP). Additionally, the MWE offers support to R&D programmes aimed at businesses, such as the Brandenburg Innovation Vouchers and ProFIT, a programme for promoting research, innovation and technology. The Ministry for Labour, Social Affairs, Health, Women and Family (MASGF) and the MWE are supporting startup incubators at all state universities through Brandenburg's Operational Programme (OP) as part of the European Social Fund (ESF) in the 2014-2020 funding period. In addition, the MASGF supports – also within the same OP ESF scheme and funding period 2014–2020 – the projects “Innovationen brauchen Mut” (German for: Innovations take courage) and “Fach- und Arbeitskräfte in Brandenburg” (German for: Skilled labour and workforce in Brandenburg). Both initiatives are run by Brandenburg Invest (WFBB). Furthermore, under the OP ESF in the funding period 2014–2020, the

guideline “Brandenburger Innovationsfachkräfte” (BIF; German for: Brandenburg Innovation Experts) contributes to the implementation of Brandenburg’s skilled labour strategy.

The concept is based on the Regional Innovation Strategy of Brandenburg (innoBB plus). It focuses on five transnational clusters as laid out in the joint innovation strategy with Berlin and adds another 4 clusters specific to Brandenburg and aims for the state’s regionalisation.

The government’s ministerial working group called “Integrierte Standortentwicklung – Stärkung der Wachstumskräfte durch räumliche und sektorale Fokussierung von Landesmitteln auf die Regionalen Wachstumskerne im Land Brandenburg” (German for: Integrated Location Development – Driving growth through spatial and sectoral focussing of state resources on regional cores of growth in the State of Brandenburg) coordinates the government’s activities for regional growth, i.e. those that regard knowledge and technology transfer, skilled labour, and implementing the cluster strategy. The aim is to promote the state’s economic development and attraction. Here, transfer and cooperation between local partners and scientific institutions play an important role.

In 2015, the MWFK bundled its transfer-related measures in a so-called transfer offensive. Significant new measures included the event series “Transfer Offensive On-site” with on-site appointments at universities as well as the “Transfer Audit” initiative. An overview of these activities is provided below.

Event series ‘Transfer Offensive On-site’

The MWFK carried out the event series Transfer Offensive On-site at all campuses of Brandenburg’s universities between June 2015 and September 2016 together with each university. The aim was to first present to a small group of decision-makers those transfer activities, which had been meaningful in the respective region, and to also discuss future perspectives for transfer in the region with those present. The exemplary transfer measures provided an insight into the various transfer activities on site. In the discussions and debates, informative starting points for the further development of transfer in the respective region emerged.

Transfer Audit

The Transfer Audit for Brandenburg Universities was a joint project by the MWFK and the so-called Stifterverband, a joint initiative by companies and foundations concerned with science in Germany. At the same time as the nationwide pilot, a separate pilot was carried out in Brandenburg from June 2015 to September 2016. All of Brandenburg’s universities took part in this state-wide audit.

The Transfer Audit by the Stifterverband is an instrument for development that supports universities in developing their institutional strategy for cooperation with external partners through a process of collegial consultation. The procedure is based on each university’s own objectives for transfer activities and is neither a performance evaluation nor certification. Instead it serves the university to receive the best possible support in formulating and achieving its goals. The Transfer Audit offers universities the opportunity to win an overview of previous activities and otherwise separate developments in the area of transfer, to then review and focus them, and to generate insights and action-oriented measures for their institutional strategy in dialogue with experts.

All universities have received their audit reports from the Stifterverband in the meantime. Their findings were used for either the initial or further development of their transfer strategy. In addition to the transfer audit, the cooperation included recommendations for policy makers to further develop regulations and funding policies promoting cooperation and transfer.

The insights gathered during the debates as part of the Transfer Offensive On-site events and the Transfer Audit were crucial in outlining the present Transfer Strategy’s content. Overall, it became apparent that the current understanding of transfer requires an expansion in order to accurately reflect the scientific institutions’ diverse transfer activities as well as their effects on the economy, politics and civil society.

4. Broader understanding of transfer

The government of the State of Brandenburg regards the transfer of knowledge and technology a general social duty and an essential element of regional development. This task is decisively shaped by a large number of players from science, industry, politics and civil society and their intense mutual exchange.

Haus Brandenburg is a joint design initiative by Potsdam's University of Applied Sciences (FH;P) and Deutsche Manufakturenstraße, an organisation that unites manufacturers in Germany. The project started in early 2017 to bring together Brandenburg-based craftsmen, manufacturers and designers. Together they are to create products with a regional touch.

www.fh-potsdam.de/forschen/projekte/projekt-detail-ansicht/project-action/haus-brandenburg/ (in German)



Design initiative "Haus Brandenburg" at the University of Applied Sciences Potsdam

Transfer is a process that cannot be accomplished by one scientific institution alone. The decisive factor for the transfer of knowledge and technology is the structured and broad cooperation between those players generating knowledge as well as those acting in the economic, political and civic spheres in Brandenburg.

The process in which the scientific institutions and all other players take part through interaction and other various formats, must be recognized and supported in its entirety if the transfer of knowledge and technology is to be successful. Only then is it possible to tap into the full potential of transfer from science, when taking an integrated view of research and teaching in the long-term.

Three dimensions of knowledge and technology transfer

The broader understanding of transfer includes the dimensions of *communication of knowledge generated through research, scientific consultation, and the application of science*¹⁶. Universities and research institutions may emphasize them to varying degrees and according to their professional profiles and transfer strategies based on these. At the same time, all together these activities represent what is required for the successful transfer of scientifically generated knowledge into different sectors of society.

Knowledge and technology transfer is a discursive process, in which knowledge generated through research in the form of findings¹⁵, services and technologies is communicated, exchanged, applied, and developed through both projects and people. Thus, knowledge and technology transfer does not only refer to transferring knowledge and technologies from science into the private sector. Rather it means gathering different partners who together initiate a transfer of knowledge, innovations ready for application as well as learning for mutual development.

¹⁵ This includes knowledge that has been generated in a scientific and/or artistic manner.

¹⁶ Compare position paper of the German Council of Science and Humanities, in German www.wissenschaftsrat.de/download/archiv/5665-16.pdf

The *communication of knowledge generated through research* can be used for the purpose of imparting knowledge, conveying information, continuing education as well as social discourses, or the understanding of scientific work as well as knowledge transfer into society. Science communication is thus an essential component of knowledge and technology transfer. It can come in traditional formats, i.e. lectures, exhibitions or contributions in old media such as newspapers, radio and television. The advent of digital media however, has expanded the range of channels and formats significantly. The same is true for patterns of work, communication, and information in society as a target group. As a result, scientific institutions must communicate in a new manner, both qualitatively and quantitatively. In addition to public relations, ultimately individual as well as young scientists must take on the role of communicators.

The webpage called Research & Practice in Dialogue is a channel, where scholars from IRS engage with practitioners. They seek to provide impulses for planners and other players based on their research and in turn receive feedback from practitioners and gather new ideas for research projects.

www.leibniz-irs.de/en/knowledge-transfer/research-practice-in-dialogue/

The AWI's German Arctic Office, or Office for Information and Cooperation in the Arctic, is the first overarching competence centre of its kind. It serves as platform for information and cooperation between stakeholders invested in Arctic science, politics and industry in Germany.

www.arctic-office.de/en/

Another important transfer activity is the so-called brain transfer, which takes on the form of internships and dissertations within the universities' realm. By opening up to new audiences and training graduates for the region as well as offering a wide range of continuing education offers, universities can position themselves within civil society and in their region as central sites of research and open, accessible knowledge transfer.

For care givers and executives in geriatric care, the Brandenburg University of Technology (BTU) has developed continuing education formats in nursing science as well as modules for organisational and personal development. These become implemented into compulsory training programmes of facilities.

www.b-tu.de/weiterbildung (in German)

The integrated degree programme Optics/ Optical Equipment Technology at the TH Brandenburg establishes a close connection between students and companies from the start. The combination of academic aspirations and the practical relevance of in-company training builds a bridge to the local job market and help companies to strengthen their innovation and secure the next generation of qualified workers.

Moreover, the agency "Duales Studium Land Brandenburg" based at the TH Brandenburg, advises prospective students on the wide range of integrated degree courses offered at the universities in the state, while acting as contact for companies at the same time.

www.th-brandenburg.de und www.duales-studium-brandenburg.de (in German)

Scientific consulting services can take various forms. There are oral or written statements, the expert opinion, strategy concepts, draft programmes or, membership in committees such as scientific advisory councils. Here, scientists act as independent experts lending insights from objective research. In the field of consulting, various examples of cooperation between scientific institutions and players from politics and society exist already. This initiates a significant transfer of knowledge from science into various parts of society.

The feasibility study 'Welterbe Grünes Band' (World Heritage Green Belt) by the Leibniz Centre for Agricultural Landscape Research (ZALF) and its transfer society agrathaer GmbH was a commission by the Federal Agency for Nature Conservation (BfN) and the Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU). The study drafted various scenarios for the perception of the former Iron Curtain as a cultural and natural heritage of the Cold War in Europe and the possibility of its recognition as UNESCO World Heritage.

www.zalf.de/en/transfer and www.bfn.de/fileadmin/BfN/internationalernaturschutz/Dokumente/BfN_Machbarkeitsstudie_Welterbe_Gruenes_Band.pdf (in German)

The area of *application of science*, or applied research, focuses on the traditional transfer of knowledge and technology but moves beyond it. An example is its role in the development of clusters as laid out in the Innovation Strategy innoBB plus. There are various other ways of exploitation that range from the establishment of research cooperation with companies outside the clusters or with public institutions over to spin-offs. Applied research further includes the registration of intellectual property rights, i.e. in the form of invention disclosures or patents with the opportunity of licensing, sales or as a foundation for startups. However, insights from research may also be applied by other transfer agents using infrastructure at scientific institutions.

By founding the IHP Solutions GmbH in August 2015 in Frankfurt (Oder), the IHP has institutionalised its knowledge and technology transfer activities, thus making them future-safe. These structures enabled IHP to further extend the transfer and application of innovative research results dealing with wireless and broadband communication, resulting in real-life applications.

www.ihp-solutions.com

Using an Innovation Voucher, the University of Potsdam cooperated with a local SME via its subsidiary UP Transfer. For a project, they jointly launched a multicopter that takes pictures of orchards with a multispectral camera. The aim: to forecast yields for individual areas and to advise on their management. Together with several companies based in the metropolitan area, a novel processing technology for the early detection of hypertrophication, i.e. when water becomes overly enriched with nutrients that induce algae growth, was developed afterwards.

www.potsdam-transfer.de (link in German)

In the last few years, several spin-offs from the Max Planck Institutes in Potsdam-Golm have transferred results of basic research into products, and also created jobs in the region.

www.mpikg.mpg.de/en; www.mpimp-golm.mpg.de/2168/en and www.max-planck-innovation.de/en/

GFZ has an entire unit dedicated to technology transfer. They support scientists and academics not only in the utilisation of their research results but also advises on spin-offs. There have been eight spin-offs from GFZ in the last few years.

www.gfz-potsdam.de/en/centre/technology-transfer/

In addition to this traditional understanding of market-driven knowledge and technology transfer, various other activities are now coming into focus due to the broader understanding of transfer that is open to more transfer partners and formats. A wider concept of transfer thus looks at scientific institutions and their diverse services in generating and conveying findings from research and thus gives new room for the recognition of transfer services as well as the potential to optimise existing structures of knowledge transfer and application.

Various research institutions in Brandenburg work on the Intergovernmental Panel on Climate Change (IPCC). Until 2015, their working group on climate protection was led by researchers from PIK for example. The IASS is active here too. Their project "Paradise reloaded – the 'creation' in the Anthropocene" sees the IASS display the development of the human-nature relation in an artistic discourse to reach a wider audience.

www.pik-potsdam.de and www.iass-potsdam.de/en

Specific transfer profiles of scientific institutions

Successful transfer often requires first pooling findings from research across different disciplines. Interdisciplinary research activities must take place within the institutions already, and they must feature transdisciplinary connections with external partners as well. Their findings must then be edited in a way that guarantees their comprehension in each scientific discipline as well as conveying the research itself.

To meet these high requirements for successful transfer, each university and research institution should support and emphasize their respective research capabilities through targeted communication, advisory activities and applied research in different parts of society and particularly within their region. Hence, a wider understanding of transfer is the basis for the institution-specific priorities in their transfer profiles. It allows the institutions to foster their connections based on topics and region and to also approach potential new partners with clear proposals for the implementation and initiation of new transfer projects based on their own transfer strategies.

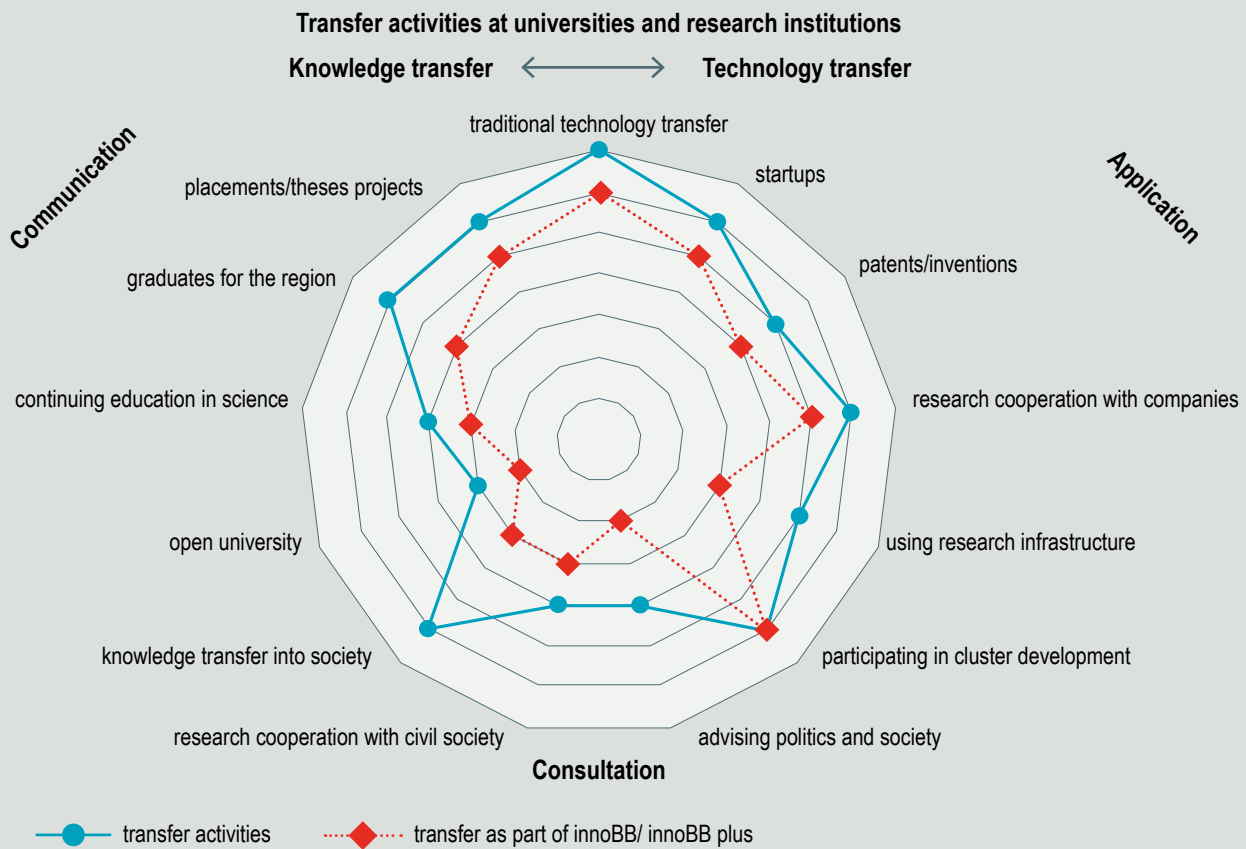


Figure: A prime example of the focus of transfer activities of scientific institutions

A consistent set of actions along these three dimensions of knowledge and technology transfer that is taking into account different target groups, results in the individual profile of each institution. This profile should focus on the research capabilities of each university or external research institution. An overview of typical transfer activities of a scientific institution is shown as an example above. The scientific institutions have already been asked to assess the priorities and characteristics of their own transfer activities, specifically with regards to their share in innoBB or innoBB plus.

Knowledge and technology transfer through close interaction between different players

Successful cooperation involving the transfer of new knowledge must take into account the participating partners' different backgrounds and exploitation interests as well as their capacities. This requires the translation of scientific findings into methods, ideas and linguistic styles, which can be understood outside of specialized dis-

ciplines and which all partners can access at any time. Conversely, non-scientific partners must show a willingness to engage with knowledge based on research and its emergence during the transfer process.

An extended concept of transfer thus increases the demands on the various institutions involved in transfer. It requires a discursive and consolidating exchange about new research questions, which already takes into consideration the manner in which the answers will be communicated. Such an exchange must be integrated and lead right to the institution's executive management. This concept also requires the willingness of transfer partners from business, politics and civil society to adjust to the specific manner in which research generates new knowledge, that is without the guarantee of desired results.

Key players for knowledge and technology transfer in Brandenburg are the state's *universities and external research institutions*. They have been applying research and technologies they developed in various forms of cooperation to different parts of society. Due to the nature of Brandenburg's specific economic structure, numerous SMEs but also larger companies that structurally define Brandenburg are important players and target group for both knowledge and technology transfer. In close cooperation with local scientific institutions, significant contributions can be made for working successfully on both sides; ideally, this fosters sustainable economic growth, whilst stimulating research activities.

This can build on the Joint Innovation Strategy Berlin-Brandenburg adopted in 2011, which includes five joint clusters (innoBB) and four Brandenburg-specific clusters (innoBB plus). Coordinated cooperation in the various clusters is one of the successful and crucial cornerstones of transfer activities across the state. Players from science and business contribute their subject-specific expertise here.

The universities and other research institutions as main organisations for the generation of new knowledge and technologies based on research have an additional function in the broader understanding of transfer: They too are responsible for knowledge to be methodically generated and applied to broad social contexts in *politics and civil society*. Transfer complements research and teaching and does not compete with these tasks as in fact, transfer of knowledge into society has always been a core competence of research institutions. With the wider concept of transfer, the scientific institutions are given greater opportunities for testing various innovative transfer projects and formats. The public perception of their services should significantly increase in return. At the same time, efforts are underway to consolidate the structures of those involved in knowledge and technology transfer.

In this context, the ministries of the state, above all the MWFK, MWE and MASGF as major players in Brandenburg's knowledge and technology transfer have an important task to do. Together they empower the different players to enter into and to maintain a structured exchange during their cooperation. In this way, the reciprocal imparting of knowledge and its transfer and generation can be put into practice successfully. Public and

private transfer partners receive support from intermediary organisations such as the WFBB and the business promotion bank of Brandenburg (ILB) for this purpose.

Making knowledge from research accessible and applicable to all parts of society

Knowledge transfer of socially relevant research results and research processes as one of the main competencies of universities and other research institutions strengthens their regional acceptance and roots. Disseminating knowledge in society through application, consultancy and communication overcomes the limitations of a discourse that could otherwise only be accessed by a few and thus makes knowledge available to larger audiences and more users. In this way, a greater acceptance of the internal processes and structures at play when generating new knowledge through research can and should be achieved. A transfer concept which includes a social dimension therefore considers transfer from science not just in light of commercial exploitation. The expanded concept of transfer rather recognizes science as embedded in society and each institution's regional environment, thus taking into account the different processes and forms of exchange among transfer partners. In future, the State of Brandenburg will use this broader understanding of transfer of knowledge based on research as a guide, whereby the Regional Innovation Strategy innoBB plus will continue to apply to business-driven transfer. All players outside science shall benefit from the dissemination and application of modern, scientifically generated knowledge. After all, knowledge and technology transfer substantially contribute to the creation of added value with social relevance as it encourages cooperation rooted in knowledge. In order to strengthen the transfer process according to the broader definition presented here, it is necessary to take an integrated perspective when looking at the overall picture and also at the different fields of action and measures. These are described in detail in the following chapter.

5. Fields of action and measures to strengthen transfer of knowledge and technology in Brandenburg

5.1 Optimising structures for transfer

1. Define and position transfer structures and their function within the context of a broader understanding of transfer

By participating in the Stifterverband's audit process and the on-site visits during the transfer offensive, the universities reflected on their internal processes and structures and analysed their existing strengths and weaknesses. Based on these actions, the state supported the universities in developing their individual transfer strategy to suit their respective focus and priorities, all while applying the broader understanding of transfer. The implementation of these transfer strategies, which have become available in the meantime, will further advance the process of sharpening the profile of each university.

The scientific institutions are aware of the subject of knowledge and technology transfer and consider transfer to be a unique and socially significant task. Transfer, combined with research and teaching, should be an integral part of the structures of higher education institutions, and be embedded long-term.

Based on the universities individual transfer strategies, the structures required for supporting transfer profiling at universities must be defined and designed. The state government emphasises the universities' responsibility to create adequate structures of transfer in order to ensure its success in the longterm. Nevertheless, the state government will continue to support the universities in this task through appropriate measures.

→ Facilitating funding for transfer offices at universities

Transfer offices, which were previously funded under the ERDF-WTT Directive, are tasked with business-driven transfer in conjunction with the master plans for the clusters as part of the Regional Innovation Strategy innoBB plus. The improvement of business-related technology and knowledge transfer in selected clusters of innoBB plus is the core objective of Priority Axis 1 of the ERDF Operational Pro-

gramme 2014–2020 of the State of Brandenburg. Intensifying the communication and cooperation between science and industry is promoted through various programmes by the MWFK and MWE. Professional structures within universities that are able to sensitise researchers relevant to transfer, to accompany activities in the clusters, and to refer interested companies to the university, are crucial for this to succeed. By intensifying sustainable networking structures in the clusters, cooperation between science and industry should be improved, and also encourage other scientists to embark on joint industry projects. The results and impact monitoring (EWM) of the innoBB plus clusters which includes data on scientific activities and project partners since 2016 will clarify this further.

In the past, the MWE has funded transfer offices at universities with a budget of EUR 60,000, which could be topped up to EUR 120,000 based on increased expenditure. However, justifying and verifying that increase in cost involved complicated reporting, which tied in staff otherwise required for transfer activities. In order to simplify the funding procedure, the intention is to dispense with the previous verification procedure from 2018 onwards and to grant funding of up to EUR 150,000 in general.

An evaluation of success is planned via innoBB's so-called EWM monitoring method, which takes into account the dynamics in knowledge and technology transfer. For example, it records the number of collaborative projects between science and research institutions with companies, or the number of science and research institutions acting as project partners in projects with the industry.

→ Expanding transfer structures based on the broader understanding of transfer

The universities may define which role transfer agencies funded through the MWE may play within their internal structures themselves. According to the broader understanding of transfer, these agencies represent a key element of the universities' transfer structures even though they can only assume responsibility for defined subtasks during initiation, pro-

cessing and communication of the university's transfer activities. Therefore, the universities are asked to ensure that an integrated overall structure charged with transfer tasks closely ties into other university structures. The MWFK will review how to expand and further support transfer structures, i.e. by including them in university contracts from 2018.

In case external research institutions plan to expand their transfer structures based on said broader understanding of transfer, the MWFK will consider lending their support.

→ Defining the role of external transfer agencies

Transfer companies that have been outsourced and form legal entities undertake tasks of both knowledge and technology transfer at some universities and external research institutions as well. Such tasks include the implementation of cooperation projects with companies or offers of continuing education for example.

The state government will confer with universities on the function and tasks of external structures for transfer. The extent of opportunities to perceivably assign transfer services to each university and to possibly express these in statistical parameters is to be investigated as well. In order to do so, universities will clarify the various tasks and divisions between internal and external structures and define specifications internally.

At the external research institutions, new, institution-specific proposals will be identified and driven forward accordingly in respective committees.

2. Strengthen transfer activities with regards to Intellectual Property (IP) rights

Patents are an important element of classic transfer, not only for licensing or selling to a company, but also as a basis for spin-offs. But other intellectual property rights may be relevant to scientific institutions (i.e. utility models/innovation patents, trademarks, etc.) as well as dealing with copyright.

Eight Brandenburg universities have joined forces in the Utilisation Offensive Brandenburg (VOBB) to secure and exploit inventions from research. Two research institutes of the Leibniz Association are currently members of VOBB as well. In addition, the external research institutions operate an institute-specific management of intellectual property rights, which is also taken into account when evaluating the facilities. In some cases, the institutes are supported by patent and exploitation structures based at the research organisations' main offices.

Through project funding as well as university contracts, the state government complements the federal government's support (SIGNO, since 2016: WIPANO) for VOBB. In addition, measures to sensitise, inform and motivate scientists dealing with research results worthy of protection are being promoted since 2016.

In recent years, Brandenburg's universities have submitted about 40 invention disclosures a year for VOBB to further examine. However, the benefits of patents and other intellectual property rights for the regional economy are considered limited due to its fragmented structure, thus limiting the positive economic effect of intensifying IP activities. Instead, introducing the regional economy to the use of patents from science would be meaningful. Overall, there is a greater potential for strategic develop-



Ophthalmic optics and optical instrument technology at Brandenburg University of Applied Sciences (THB)

ment and support, especially at technical universities, to increase the number of invention disclosures and patent applications as well as their exploitation. The following measures are to serve this purpose:

→ **Developing and implementing specific IP utilisation strategies**

Universities are to review the relevance of intellectual property rights protection and how to deal with them and to develop corresponding – if not already existing – university-specific IP utilisation strategies. University internal processes (i.e. establishing a rating commission) for the review, evaluation, and decision on invention disclosure or IP applications are an important prerequisite for this. Here, it is recommended to focus on the strategic and qualitative development of university-specific patent portfolios.

→ **Optimising structures to secure and utilise IPs**

The state government will continue to support the protection and exploitation of inventions based on research. The universities and research institutions affiliated with VOB are to review their structures for IP security and their efficiency over the next few years to then further optimise and establish sustainable structures.

→ **Validating innovation potential of research**

Significant innovations for business and society from science presuppose that a bridge between research and the utilisation or application of research results is built in the sense of validation. In this context, the state government will review whether it can co-finance federal programmes for systematic validation of research results and development of possible applications, as is done by other federal states.

3. Startup activities within the realm of scientific institutions

In addition to the state government's startup and business succession strategy, this Transfer Strategy only refers to a few actions that focus on startups and founding activities within the scientific realm.

With about 22 startup projects under supervision and 4 spin-offs per 1,000 students (2012), Brandenburg universities are ranked at the top next to Saxony and Schleswig-Holstein. By now, Brandenburg universities see an average of about 150 business startups a year.

Nevertheless, the State of Brandenburg still has catching up to do when it comes to startups with a focus on knowledge and technology (only about 1 per 10,000 employees in 2012 in nationwide comparison)¹⁷.

The non-university research institutions also offer services specifically for those interested in founding a business. Some of these offers are embedded in comprehensive strategies of the research organisations and supported by structures based at their main offices. In recent years, research institutions created a number of startups focused on knowledge and technology. This potential is to be tapped into further for regional economic development in future.

The following actions aim to increase the number of startups focussed on knowledge and technology as well as to convince more founders from scientific institutions to remain in the region.

→ **Sensitising and supporting startup projects with a focus on knowledge and technology**

The WFBB-based and ESF co-funded project Ibm for "Innovations take Courage" supports research institutions in founding businesses with an emphasis on knowledge and technology. In addition, the scientific institutions can call on WFBB's range of services for founders.

For innovative startups from universities and research institutions, the funding schemes EXIST, a business startup grant, and EXIST for research transfer, set up by the Federal Ministry for Economic Affairs and Energy (BMWi) are of great importance. In order to facilitate their use for universities, the services for startups already promoted by the MASGF and MWE will receive additional funding through the ESF from 2018 to 2020.

→ **Providing suitable facilities for startups of scientific institutions**

The state government welcomes the fact that the starting conditions for founders at universities and those research institutions prone to startups, exist or are being expanded.

¹⁷ "Ländercheck: The university as Incubator", May 2014, Stifterverband, available in German: www.laendercheck-wissenschaft.de/gruendungsfoerderung/beratung_und_ausgruendungen/index.html.

Where necessary, the state government strives to provide suitable premises for already established startups in the scientific environment together with the districts or municipalities and in coordination with the scientific institutions. Care must be taken to ensure that such incubator centres know the specific needs of local startups focused on knowledge and technology so that they may provide adequate infrastructure.

→ **Establishing complementary incentive systems for startups to remain in the region**

The state government will examine whether additional incentives should be offered in order to promote stronger ties to founders from science so that they may remain in the region.

4. Securing skilled labour / strengthening ties between graduates and the region

In the context of the Brandenburg strategy for skilled labour which aims to secure qualified workers for Brandenburg's economy, the Transfer Strategy creates synergies that are crucial to support the state's skilled labour policy actively. In the continuation of the strategy for skilled labour in the 2014-2019 legislative term, five key issues have been identified as priorities for action, so that the demand for qualified workers can be met in the short and medium term. Particularly suited to the Transfer Strategy are the key topics "Specialists and clusters" and "Expanding integrated degree programmes as required".

When forming the clusters and implementing the master plans, measures targeting specialists must be developed in order to promote these clusters optimally. The demand for highly-skilled personnel in companies prone to clusters is growing steadily and is a decisive factor for their success. Therefore, various points of contact for graduates and companies as well as incentives to place graduates with companies should be set up – especially when preparing for a potential business succession. With the ESF funded scheme BIF in the 2014-2020 funding period, the state promotes the employment of young highly-qualified people in small and medium-sized enterprises. Furthermore, companies are to be made aware and advised in order to establish longer-term human resources planning. With the consultancy services offered by the regional offices for qualified workers at WFBB, companies currently have access to a comprehensive range of information and services.

→ **Promoting integrated degree programmes ("dual studies") and extending offers**

This legislative period has seen the expansion of the range of integrated degree programmes, which combine academic studies with vocational training at a company, at Brandenburg universities with the state government's support. Likewise, a coordinating office for Brandenburg, the Brandenburg "Agentur Duales Studium" (German for: Agency dual studies) has been set up at the Technical University (TH) to advise both prospective students and companies. Both the agency as well as new university courses of that kind shall become more widely known in future. Therefore, the MWKF is to organise various regional forums. Both the courses' consolidation and their expansion in coordination with the chambers of commerce and companies is a joint effort of the universities and the state government.

→ **Further develop the BIF funding scheme**

The state government is reviewing whether the funding programme "Brandenburger Innovationsfachkräfte BIF" (Brandenburg Innovation Experts) can be developed further with funds from the European Structural Funds (ESF) in the funding period 2014–2020. The aim is to support companies in winning graduates and to thus initiate innovation more efficiently in future. Currently, this programme supports so-called innovation assistants and scholarships as well as the employment of student trainees.

→ **Connecting graduates and companies in the region ever closer**

An important task for policymakers is to create appropriate policies to promote job opportunities for graduates, particularly in rural areas. In future, the WFBB's labour department is to work more closely with universities and particularly their career centres. An inclusion of the chambers of commerce is being considered. The objective is to create easily accessible and customised offers. The ESF-funded "Fachkräfteportal" (German for: skilled workers portal) at the WFBB offers a comprehensive range of information addressed to young professionals to find a job at a Brandenburg-based company.

In addition, the "Deutschlandstipendium" (German for: Germany grant) provides companies with a valuable tool to get access to future specialists early on.



Industrial Engineering and Management at TU of Applied Sciences Wildau (THWi)



Aviation Engineering/Aviation Logistics at TU of Applied Sciences Wildau (THWi)

5.2 Field of action: improving transparency, cooperation and communication

Concerted communication both within and from scientific institutions to the outside world is crucial to make existing as well as potential transfer activities visible and well-known and to thus contribute to the appreciation and expansion of transfer.

The professional communication of socially relevant research results in a manner that is comprehensible even to the laymen, helps to reach the relevant groups for transfer activities and to establish a dialogue via various communication channels and formats. Firmly established and clear communication channels and structures increase the perception of knowledge and technology transfer already existing at scientific institutions. This also facilitates finding matching partners for transfer.

The scientific institutions benefit from professional visible communication with designated points of contact both internally and externally, as they can strengthen their transfer activities this way. It also sees them position their research and transfer profile in the region and beyond. One element of this was the transfer offensive carried out on site at the universities. Particularly with regard to external representation and communication, some ins-

titutions appear to have potential for expansion – be it online or through direct contact. This is especially true in view of the broader transfer term.

This potential does not only refer to the scientific institutions' representation in communications. Also the importance of newly founded companies for the region's economic development has to be communicated both within the institutions and to the outside world. This could increase the regard for startups and founders in the region, for example through their involvement in events and networks.

Cooperation based on mutual trust between all transfer partners is essential for the successful exchange of knowledge and technologies between institutions and individuals. Transparency via the communication channels of the various organisations involved in transfer – scientific institutions, ministries, intermediaries, companies and social players – facilitates the continuous exchange of information based on trust and the public perception of research results.

1. Improving transparency and cooperation

→ Building a transfer profile internally

Establishing a clearly defined point of contact both internally and externally in academic institutions is considered helpful in order to be able to receive, assign and process transfer requests and offers in a concise manner. Firmly embedding this touch point

into internal structures in the sense of a hub is a necessary prerequisite. At the same time, responsibility must be clearly assigned and known to those within and outside the organisation.

The meetings during the transfer offensive on site made clear that there is potential for optimisation of the universities' internal coordination and communication when it comes to external inquiries from industry and society. Here, universities must ensure competent points of contact and embed them internally and externally in a transparent manner.

→ **Increase networking among scientific institutions**

Based on their transfer strategies, the universities have defined specific priorities or a main focus they wish to build on. Collaboration among each other is to be developed strategically through jointly supported institutions such as BIEM, the Brandenburg Institute for Startups and SMEs, or VOBB. The state government will continue to support these joint activities as required. This process involves external research institutions as they may participate according to their priorities.

→ **Focusing on roles and responsibilities of different ministries and intensifying interdepartmental strategic coordination**

On the part of the state government, the MWFK, MWE and MASGF are key players for knowledge and technology transfer in Brandenburg. They are responsible for a range of promotional offers tailored to different target groups relevant to the scientific institutions. In formulating the Transfer Strategy of Brandenburg, the ministries have already defined first transfer objectives together.

The design of further transfer measures and the Transfer Strategy's successful implementation require continuous coordination and interaction between the various departments with a clear division of responsibilities. Therefore, information and communication flow between the MWFK, MWE, MASGF is to be strengthened in future through regular exchange and coordination in a working group.



Loading a centrifuge at the German Institute of Human Nutrition (DIfE)

→ **Continuing and expanding regular exchanges on transfer between ministries and scientific institutions**

The Jour Fixe meeting, to which MWFK invites the universities' Vice Presidents responsible for transfer, the MWE and since autumn 2016 also MASGF, has proven its worth. It has been taking place regularly for some years now and this established form of communication between the state government's departments and universities will be continued, hosted by MWFK and extended when required.

The inclusion of external research institutions interested in specific transfer topics, or the initiation of a similar regular meeting is being envisaged.

→ **Optimising cooperation between Brandenburg Invest (WFBB) and universities**

The WFBB's cooperation with the universities has intensified considerably in recent years. Joint topics and touch points are the cooperation between business and science in R&D, the cluster development as laid out in innoBB and innoBB plus, the supervision of startups as well as securing skilled labour by means of various support programmes of the state. As a result, collaboration has become increasingly complex over time.

In coordination with the government, the simplification of touch points and number of contact persons in connection with a clear role description and assignments on both sides aims to improve cooperation. Internal competition is to be avoided at the same time.



Pipetting in laminar flow closet at the German Institute of Human Nutrition (DIfE)

In addition, WFBB and the universities agreed to implement cooperation based on existing agreements more purposefully. To this end, the state of cooperation with concrete arrangements for further cooperation at each university shall be reviewed annually. The Brandenburg Regional Rectors' Conference (BLRK) and the WFBB will inform the responsible ministries about the general state of cooperation at least once a year.

To increase communication and transparency overall, WFBB will also participate in the MWFK's Jour Fixe with the Vice Presidents for Research and Transfer.

→ Continue and further develop project "Perspektivwechsel" (change of perspective)

The "Perspektivwechsel" (German for: change of perspective) project has been carried out jointly by the MWFK and the Brandenburg Chambers of Industry and Commerce since 2007. It sees representatives from Brandenburg's science and industry as well as other institutions switch their jobs for one day. This literal change of perspective serves a straightforward initiation of exchange and cooperation between scientists and researchers with regional entrepreneurs. This easy access offer has proven its worth with over 120 pairings having swapped roles so far. The project is to be continued and further developed in terms of the broader concept of transfer. The inclusion of players from cultural and social institutions is being considered.

2. Communication

→ Improving communication between scientific institutions

Scientific institutions already run a variety of transfer activities that take into account the broader concept of transfer today. As a whole however, this is hardly transparent or comprehensible for external partners for potential transfer. This suggests, that in this context, more direct, informal meeting opportunities for potential transfer partners from science, industry, politics and civil society should be set up.

Potential for enhancing transfer activities is also seen in the update and professionalisation of communication and public relations using various communication channels and formats. This requires scientific institutions themselves to review their external representation and, if necessary, to strengthen it and, also to actively support scientists in their own presentation.



Centrifuge

Unless already done, scientists should be provided with even more comprehensive advice and support for professional science communication as well as with the staff this requires. Already during research, they need advice and support in deciding to which target groups particular results from research may be addressed in order to start a dialogue. As part of the professional advice, it is advisable to tune communication and media content both to the specific target group and the research result that is to be transmitted and to support the planning and implementation of the communication process as a whole. These offers should take a clearly defined place in the



institutions' organisational structure so that they act as permanent point of contact for all interested scientists. Moreover, distinct structures and responsibilities help to consistently represent and sharpen individual research and transfer profiles developed as part of the transfer strategies to the outside world.

Scientific institutions should embed professional science communication already in the qualification of young scientists and, if they have not already done so, integrate it into the interdisciplinary qualification of their junior researchers as well.

→ Update and better correlate web pages with regard to the wider transfer term

Representing the scientific institutions optimally is an important step to tap into additional potential for transfer within the context of the broader understanding of transfer. Coordinated interaction between key players in Brandenburg can help to strengthen each other further. The production of cross-references or links between their websites serves this purpose. This applies to websites of scientific institutions as well as to those of ministries and intermediaries.

→ Financial rewards for innovative communications

In a competitive tender in 2018, MWFK plans to select the best concepts and measures of universities and other research institutions for new, innovative forms of communication with companies, social groups and institutions. They will receive startup capital from existing budgets.

5.3 Field of action: Adapting and optimising funding opportunities for transfer

The state government supports transfer at scientific institutions both indirectly through the design of regulations, policies and incentives as well as directly through funding projects. This can regard actual transfer activities between scientific institutions and partners as well as human resources and infrastructures.

Indirect support mainly concerns universities and is carried out by the MWFK through the allocation model of higher education funding and university contracts.

Direct support is currently provided through grant schemes, predominantly funded by EU structural funds of the 2014-2020 funding period. These are subject to the EU Commission's requirements and, as a consequence, to regional implementation or focus. Bear in mind as well that the continuation of these programmes is uncertain once the current 2014-2020 funding period ends.

Measures in this field of action aim to further optimise both indirect and direct opportunities to support transfer either through the state government or the scientific institutions themselves. Also, it is important to strengthen a culture of transfer at scientific institutions by further developing incentives.

Incentives for transfer activities on the part of higher education institutions can be set in various ways: ideally by appreciation and recognition, monetarily by means of their budget or, temporary by freeing time. Higher education institutions are to strengthen transfer activities of their students and staff by creating suitable incentives. The Higher Education Act of Brandenburg already offers various such options, which should be utilised even more in future.

Another important base for the expansion of transfer activities is to further qualify scientific staff for transfer tasks. Universities may consider several instruments for this, and with regards to their autonomy, they need to implement these themselves as well as in cooperation with the state government where necessary. In addition, tapping into structural funds should be facilitated as much as possible.

1. Overarching indirect support to strengthen transfer

→ Allocation model of university funding

One performance criteria of the allocation model adopted in 2015 is "third-party funding from the commercial sector". This criterion, which is to be maintained in future, sets an incentive for universities to cooperate with companies.

→ University Contract

Transfer is already part of all university contracts for the 2014-2018 term. The state government will include it in negotiations of successor treaties. Transfer will be an important performance dimension of university contracts in future and be based on the broader understanding of transfer.

2. Payments for transfer through universities

The Brandenburg Higher Education Act (BbgHG), the Teaching Obligation Bylaw (LehrVV) and the Higher Education Remuneration Bylaw (HLeistBV) already include various incentives for the university to reimburse transfer internally.

The state government encourages higher education institutions to use the instruments listed below even more than before to reward and strengthen transfer activities.

→ Reduction of teaching hours

According to § 8 par. 3 No. 6 LehrVV, teaching hours can be reduced to allow time for "tasks regarding innovation and technology transfer".

→ Career break for transfer projects

According to § 42 par. 4 BbgHG so-called free terms, that is a period of paid leave, can be granted for reasons of "updating one's professional know-how".

→ Extra rewards

According to § 3 par. 2 No. 5 HLeistBV, a distinct commitment to transfer from science, including start-ups and the utilisation of inventions, can be rewarded by granting extra benefits.

Further incentive options for the future are:

→ Startup term

Reserving a semester or term for founding a company could give university teachers an opportunity to engage with knowledge-based startups and to add their expertise. This option already exists in other federal states¹⁸. The state government is reviewing whether to introduce this instrument and to create the legal prerequisites in the medium term.

→ Premiums / prizes for transfer services

Rewards or prizes can express appreciation and recognition for transfer services as well as heighten motivation to engage in future transfer activities. Some of Brandenburg's universities already award such prizes. The state government encourages

¹⁸ Compare Stifterverband, "startup radar" as of 2013: startup terms existed at 7% of universities in Germany www.stifterverband.com/gruendungsradar/2013/hochschulbefragung/gruendungsverankerung/index.html.

universities, if they have not done so, to consider awarding a transfer prize to university teachers, who are particularly active in this field. Increased participation of Brandenburg's research institutions in the state's innovation awards is desirable as well.

3. Scientific staff dedicated to transfer tasks

→ Transfer as appointment criterion

Universities are encouraged to consider transfer services as a criterion next to academic achievements when exercising their right to recruit and select candidates for appointment for professorial chairs.

→ Transfer Chairs for fixed term

The state government is examining the establishment of Chairs with a focus on transfer ("Transfer Chairs") on a temporary basis. In addition to professorships with a focus on research ("Research Chairs"), established in Brandenburg since 2008 – a first nationwide – these Transfer Chairs could be set up according to § 47 (3) BbgHG and possibly established at universities. However, the corresponding legal foundations must first be laid in the BbgHG.

→ Research assistants for new recruits from industry, fixed term

Newly recruited Readers, who change from the commercial sector to academia, could initially be supported by additional employees with fixed term contracts. This is to enable the new university teachers to continue to use their business networks for transfer tasks, while they are getting familiar with research and teaching. The suggestion is to establish employment positions at universities accordingly. The MWFK is reviewing options for funding.

→ Student assistants for transfer tasks

There is just a limited amount of time available to those responsible for transfer at both universities and companies. Here, student assistants could help to organise and carry out transfer activities, thus providing flexibility. The suggestion is to create respective employment positions at universities. The MWFK is reviewing options for funding.

4. Direct actions to strengthen transfer

→ Supporting the establishment of external research institutes

The state government aims to strengthen cooperation structures and strategic alliances ready for transfer within Brandenburg's scientific community. The most recent example is the opening of the Fraunhofer High Performance Center for the Integration of Biological and Physicochemical Material Functions in Potsdam-Golm in the spring of 2017. Together with small and medium-sized companies it is to implement the entire value chain producing functionally integrated products – from basic research over its application and up to prototyping or product developments. This resulted in a future-safe, innovative performance centre with a strong appeal across the entire metropolitan region. The State of Brandenburg recently signed a Memorandum of Understanding with the Fraunhofer Society, thus confirming their commitment to strong research with a focus on application in order to achieve positive effects for technology transfer.

The Fraunhofer Society, an internationally renowned organisation for applied research and development, is an ideal partner for furthering the transfer of research into practical application in the State of Brandenburg. This can take the form of establishing new Fraunhofer project groups or joint research with universities for example. In the coming years, the state government in a coordinated effort with research organisations and universities aims for such expansion.

→ Promoting long-term scientific cooperation with transfer partners

Research institutions and their transfer partners benefit from mutual exchange and different forms of cooperation. Companies for example strengthen their market position and competitiveness with the help of research papers and results as well as qualified staff. In turn, research institutions benefit from feedback from real-life and practical know-how in their research, teaching and transfer – in terms of content, personnel and finances. The same applies to cooperation with public and civil society institutions. In this case, very different formats come into play, such as integrated degree programmes, endowed professorships, but also research coope-

ration of varying duration and up to joint research laboratories (JointLabs) in the long term. Together with the MWE and the universities, the MWFK will examine how these activities can be expanded to strengthen research institutions, the economy and other institutions within the region.

→ **Promoting locations with potential for innovation**

In coordination with municipalities and rural districts, the state government promotes the development of locations, where a high potential for innovation exists through spatial and topical proximity between scientific institutions, companies as well as public and civic institutions. Corresponding to experience gained from developing the Golm Science Park, the

aim is to create a joint location development strategy involving all ministries and other stakeholders.

→ **Strengthening thematic priorities for structural development**

In addition to spatial innovation support, the provincial government will also focus more on the coordinated promotion of specific thematic priorities based on the strengths of regional transfer players – such as the health campus Brandenburg – which may contribute to the state's structural development long-term. In particular, economic developments in the clusters of innoBB plus, but also political and social competencies and challenges are taken into account. The state government will agree on a ministerial procedure for the identification of such thematic priorities.



IHP Solutions and Sicoya winning the 2017 Berlin-Brandenburg award for innovation

5. Facilitating the use of existing support schemes and their expansion

→ Active participation of scientific institutions in developing the clusters further

A crucial element of the ERDF subsidy schemes relating to innovation are the clusters or master plans within individual clusters. In order to further develop these clusters by taking into account the scientific institutions' potential and to ensure these funding programmes are being utilised, the scientific institutions are invited to actively participate in the ongoing update of the master plans for clusters relevant to them.

→ European Structural and Investment Funds (ERDF / ESF)

The MWFK, MWE and MASGF will review whether the implementation of transfer promotion schemes they are responsible for can be further facilitated and to use such potential leeway to benefit scientific institutions within the existing legal framework.

→ Utilising scientific institutions' own infrastructure for cooperation / startups

The use of existing infrastructure at scientific facilities in the form of premises or equipment can be conducive to cooperation with SMEs, public institutions and equally helpful for startups. Here, the state government will clarify under which legal requirements companies may use such infrastructure.

→ Geographical expansion of support schemes beyond state borders

When it comes to joint projects with the industry, Brandenburg and Berlin have already agreed on funding regulations as put in place by innoBB. Their further optimisation is to be reviewed. Joint promotion schemes with other federal states (i.e. Saxony) or with Poland, involve distinct limitations and challenges. This concerns transfer activities with the regional economy as well as with public and civic institutions. Ministries responsible will review for which programmes such a geographical expansion may make sense.

→ Clarify the role of Brandenburg Invest (WFBB) and the business promotion bank of Brandenburg (ILB) in the implementation of promotion schemes

WFBB and ILB implement promotion schemes for transfer on behalf of the state government and work closely together. The MWFK, MWE and MASGF will review whether it is possible to simplify administrative processes for programmes they manage by minimising the number of point of contacts. At the same time, a division of roles must be ensured and communicated to all relevant stakeholders in a transparent manner.

→ Opportunities within the national regulatory landscape for the support of structurally weak regions from 2020

Both the federal and state governments in Germany are currently negotiating the introduction of national promotion schemes fostering growth and employment in those regions whose development is lagging behind ("structurally weak regions") from 2020. The will replace the regional policy previously applied to eastern Germany.

Universities and other research institutions with their high innovation potential, may make a crucial contribution to increasing the capacity for innovation of small and medium-sized enterprises in particular. Hence they should receive additional funding within the national system of regional policies for regions that are structurally weak. Starting points are the Joint Federal Government/Länder Scheme for the Improvement of Regional Economic Structures (GRW) as well as specialised programmes by the federal government that focus on innovation.

Areas of funding include research projects focussed on innovation and infrastructure at universities and research institutions as well as joint projects and joint research with companies. These expanded funding opportunities should be specific to regions like Brandenburg, which have below average spending on research and development from the private sector and thus particularly few innovation.

In negotiations with the federal and other state governments, the Brandenburg government will work to develop a German national system for supporting regions that are structurally weak from 2020 onwards.

→ **Review the introduction of complementary regional programmes in the field of research and innovation**

The state government is examining whether state programmes as part of innoBB plus and beyond are reasonable from 2020. It will also review how the broader understanding of transfer may be taken into account. Another starting point would be the decisive promotion of non-technical innovations.

6. Further proceedings and outlook

Based on the broader understanding of transfer, the Transfer Strategy of Brandenburg outlines three fields of action with assigned objectives and describes further actions for implementation.

Initially, those measures that have already been defined in the different fields of action of the Transfer Strategy will be implemented by and together with the various transfer partners. Their implementation contributes to the continuous review and improvement of policies and regulations for various transfer activities in the state. This guarantees that all partners consider knowledge and technology transfer as relevant for the future and that they focus on tapping into its greater societal potential for the whole of Brandenburg. At the same time, required reviews as outlined in the strategy will be completed within the next two years. This includes defining concrete steps for the implementation of guidelines and recommendations outlined in said reviews together with all relevant stakeholders.

The success of transfer activities can no longer be measured solely using classic indicators such as third-party funds and spin-offs when based on the broader understanding of transfer. Evaluation should therefore be extended to include the three dimensions of the broader concept of transfer (communication of knowledge generated through research, scientific consultation, and the application of science). In addition to quantifiable indicators such as third-party funds, research collaborations, transfer activities or publications in non-academic journals, this also requires qualitative indicators that illustrate social innovation initiated by universities and other research institutions in particular.

In an impact analysis, a distinction is to be made between parameters relating to input (resources required for the measure), output (immediate impact of the measure) and outcome as in medium to long-term effects (impact on the target group) as well as overall effect (impact on society).

Success should be measured with as little additional effort as possible. Therefore, data collection systems already in use for existing promotion measures shall be utilised whenever possible when selecting meaningful indicators. Particularly those indicators already being used by universities and research institutions to evaluate their transfer activities should be taken into account. The MWFK will determine suitable success criteria for transfer activities together with the universities, other participating ministries and the external research institutions.

After four years, progress made in implementing the actions is to be reviewed. The evaluation will be based on the Transfer Strategies' objectives described in Chapter 2.

With this Transfer Strategy, the State of Brandenburg wants to promote the transfer of knowledge and technologies generated through research into all sectors of society, namely business, politics and civil society based on the broader understanding of transfer. It reflects the state government's conviction that scientific institutions with their diverse transfer activities are of great importance for a successful regional development.

The fields of action, objectives and measures outlined in this Transfer Strategy focus on strengthening a culture of knowledge transfer and transfer in general at Brandenburg's scientific institutions, while intensifying and facilitating interaction between various transfer partners at the same time. The Transfer Strategy of Brandenburg aims to shape and successfully develop the regulatory framework and exchanges required for knowledge and technology transfer for years to come.

Appendix

AIP	Leibniz Institute for Astrophysics Potsdam
ATB	Leibniz Institute for Agricultural Engineering and Bioeconomy
AWI	Alfred Wegner Institute Helmholtz centre for polar and marine research
BbgHG	„Brandenburgisches Hochschulgesetz“ (Brandenburg Higher Education Act)
BIEM	Brandenburg Institute for Startups and SMEs
BIF	„Brandenburger Innovationsfachkräfte“ (Brandenburg Innovation Experts; ESF scheme)
BLRK	„Brandenburgische Landesrektorenkonferenz“ (Brandenburg Regional Rectors' Conference)
BTU	Brandenburg University of Technology Cottbus-Senftenberg
DESY	„Deutsches Elektronen-Synchrotron“ (German accelerator centre)
DIfE	German Institute of Human Nutrition Potsdam-Rehbruecke
ERDF	European Regional Development Fund
ESF	European Social Fund
EWM	„Ergebnis- und Wirkungsmonitoring“ (Method for measuring results and impacts of the cluster policy in Berlin-Brandenburg)
FBKW	Film University Babelsberg Konrad Wolf
FHP	Fachhochschule Potsdam; University of Applied Sciences
R&D	Research and Development
GRW	Joint Federal Government/Länder Scheme for the Improvement of Regional Economic Structures
GUS	„Gründungs- und Unternehmensnachfolgestrategie für das Land Brandenburg“ (Startup and Business Succession Strategy Brandenburg)
HGF	Helmholtz Association of German Research Centres
HLeistBV	„Hochschulleistungsbezügeverordnung“ (Higher Education Remuneration Bylaw)
HNEE	Eberswalde University for Sustainable Development
HZG	Helmholtz-Zentrum Geesthacht Centre for Materials and Coastal Research
IAP	Fraunhofer Institute for Applied Polymer Research
IASS	Institute for Advanced Sustainability Studies
IbM	„Innovationen brauchen Mut“ (Innovations take courage)
IGZ	Leibniz Institute of Vegetable and Ornamental Crops
IHP	Leibniz Institute Innovations High Performance Microelectronics
IHK	Chamber of Commerce and Industry
ILB	Business Promotion Bank Brandenburg
innoBB	Joint Innovation Strategy of the States Berlin and Brandenburg
innoBB plus	Joint Innovation Strategy of the States Berlin and Brandenburg including clusters specific to Brandenburg
InfraFEI	Promoting research, development and innovation (ERDF programme)

IP	Intellectual Property
IPCC	Intergovernmental Panel on Climate Change
IRS	Leibniz Institute for Research on Society and Space
IZI	Fraunhofer Institute for Cell Therapy and Immunology
LehrVV	„Lehrverpflichtungsverordnung“ (Teaching Hours Directive)
MASGF	Ministry for Labour, Social Affairs, Health, Women and Family
MPG	Max Planck Society for the Advancement of Science
MPI-MP	Max Planck Institute of Molecular Plant Physiology
MPI-KG	Max Planck Institute of Colloids and Interfaces
MWE	Ministry for Economic Affairs of Brandenburg
MWFK	Ministry of Science, Research and Cultural Affairs
OP	Operational Programme (ESF)
PFI	„Pakt für Forschung und Innovation“ (Pact for Research and Innovation)
PIK	Potsdam Institute for Climate Impact Research
ProFIT	„Programm zur Förderung von Forschung, Innovationen und Technologien“ (Programme for promoting research, innovation and technologies, ERDF)
SIGNO	„Schutz von Ideen für die gewerbliche Nutzung“ (Protection of ideas for commercial use, also patent initiative)
StaF	„Stärkung der technologischen und anwendungsnahen Forschung an Wissenschafts- einrichtungen im Land Brandenburg“ (Strengthening research on technology and applications at scientific institutions, ERDF programme)
THWi	Technical University of Applied Sciences Wildau
THB	Brandenburg University of Applied Sciences
WIPANO	„Wissens- und Technologietransfer durch Patente und Normen“ (Knowledge and technology transfer with patents and standards)
VOBB	„Verwertungsoffensive Brandenburg“ (Utilisation offensive)
WFBB	„Wirtschaftsförderung Land Brandenburg“ (Brandenburg Invest)
WTT-Programme	„Förderung des wirtschaftsbezogenen Wissens- und Technologietransfers und von Maßnahmen des Clustermanagements“ (Promoting business-oriented knowledge and technology transfer and cluster management; ERDF programme)
ZALF	Leibniz Centre for Agricultural Landscape Research
ZZF	Centre for Contemporary History
ZZF	Zentrum für Zeithistorische Forschung Potsdam

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Ministry of Science, Research and Cultural Affairs
of the State of Brandenburg (MWFK)
Department: Public Relations / Unit 26 –
Transfer of Knowledge and Technology
Dortustraße 36
14467 Potsdam
Germany
Phone: +49 331 / 866 4566
www.mwfk.brandenburg.de
presse@mwfk.brandenburg.de

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Ministry of Science, Research and Cultural Affairs
of the State of Brandenburg (MWFK)

Department: Public Relations

Unit 26 – Transfer of Knowledge and Technology

Dortustraße 36

14467 Potsdam

Phone: +49 331 / 866 4566

www.mwfk.brandenburg.de

presse@mwfk.brandenburg.de