UAS4EUROPE
Innovation Action Plan
For Europe

Presented on Friday, 8 October 2021

In response to Commissioner Mariya Gabriel's initiative on a European Innovation Area (EIA)
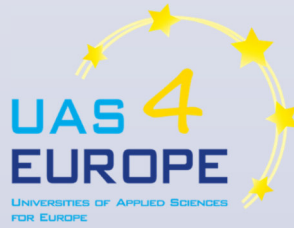
Permanent Representation of the Netherlands to the EU

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1 Background

UAS4EUROPE is an informal network (founded 2016) representing more than 2,000,000 students and 60,000 research staff in over 450 Universities of Applied Sciences from 24 European countries. The network aims to strengthen the voice of Universities of Applied Sciences (UAS) in Europe in the field of applied research and innovation. UAS4EUROPE is a networking platform for exchanging knowledge and for reaching out to European Institutions and other R&I stakeholders to ensure a better integration and visibility of UAS in Europe's research and innovation policies and programmes.

In response to Commissioner Gabriel's initiative on a Renewed European Innovation Agenda, UAS4EUROPE published an open letter to the Commissioner on 29 April 2021, in which the network expresses its support for a European single market for innovation. The letter underlines that Universities of Applied Sciences (UAS) are international key players and regionally embedded innovation drivers and as such indispensable for the success of a European Innovation Area (EIA).

As a reaction to the open letter, the Commissioner invited UAS4EUROPE for consultations on the implementation of the EIA. Subsequently, UAS4EUROPE assembled high-level UAS leaders and entrepreneurs with extensive experience in innovation and knowledge valorisation, who congregated in an expert group for innovation. The result of this work is the UAS4EUROPE Innovation Action Plan, which delivers concrete recommendations on the realisation of the EIA.

The launch of the UAS4EUROPE Innovation Action Plan is only the beginning of a process to build an EIA, to which Universities of Applied Sciences are willing and able to contribute.

The members of the expert group on innovation are the following:

- **Prof. Dr. Emanuele CARPANZANO**, Director of Department of Innovative Technologies, SUPSI (Switzerland)
- **Pedro DOMINGUINHOS**, President, Setubal Polytechnic Institute (Portugal)
- **Adj. prof., Dr. Heidi FAGERHOLM**, Rector and CEO, Oulu University of Applied Science (Finland)
- **Frank KRESIN**, Dean of the Faculty of Digital Media & Creative Industries, Amsterdam University of Applied Sciences (Netherlands)
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- **Prof. Dr. Anett MEHLER-BICHER**, Vice-president for Digitalization and Research, Mainz University of Applied Sciences (Germany)
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2 Objectives and Structure of the Action Plan

The objectives of the Action Plan are to bring forward the potential and the strengths of Universities of Applied Sciences to fully realise the European Innovation Area.

This paper is structured in four sections. The first section describes how the **strengths of Universities of Applied Sciences** can help to boost a successful renewed European Innovation Agenda. In the second part, this paper addresses the overall **European and regional challenges in the innovation space**. Thirdly, it highlights the **opportunities** that arise, if all types of higher education institutions are included in a single market for innovation. Finally, concrete **applied research recommendations** on how to realise the EIA are outlined.

3 Strengths of Universities of Applied Sciences

Universities of Applied Sciences follow a practice-based approach which promotes innovation competencies and an entrepreneurial mindset.

- Through applied research projects involving students, UAS apply a systemic approach to transmitting an entrepreneurial mindset, problem-solving skills and innovation competences.
- UAS educate and train the workforce and create the skills demanded by the labour market and the societies of tomorrow. Through a strong connection with stakeholders and their involvement in the development of study programmes, UAS are uniquely positioned to drive developments and to react to industry needs in a short time frame and thereby contributing to the European Skills Agenda.

- UAS provide life-long learning opportunities to avoid a skills gap development and contribute to innovation cohesion by ensuring that everyone can reach their full potential.

Universities of Applied Sciences respond to transdisciplinary challenges and create lasting regional impact.

- UAS focus on immediate impact-driven applied research activities, improving the innovation capacity of partner SMEs, industry and public administration.
- Thanks to their practice-oriented education, applied research activities and their strong links with their regional stakeholders (including citizens), UAS have a leading position in the promotion, adoption and successful exploitation of the open science paradigm.
- Through their transdisciplinary approach, UAS address multi-dimensional problems of the market.
- Due to their practice-orientation, UAS allow transformative science that adapts its approach and methodology to better address current challenges in society.

Universities of Applied Sciences form the link between fundamental research, market application of new technologies and societal challenges.

- Through their practice-based approach, UAS understand the needs and demands of industrial and societal partners as they understand "their language". Consequently, UAS are excellent in analysing research results for concrete applications and in developing new products and services for the market and society at large.
- By co-creating solutions with regional ecosystem actors, UAS are contributing to the realisation of sustainable development in their regions and beyond. Through their bottom-up approach, they include all actors of the innovation agenda when it comes to the integration of sustainability topics into their study programmes and their research. Furthermore, they fulfil an institutional role model function and are both a stimulus for innovation and a social multiplier with regard to knowledge transfer and sustainable behaviour.
- UAS are predestined partners for co-creation and open innovation.

Due to their regional embeddedness, Universities of Applied Sciences act as important drivers of innovation ecosystems.

- UAS have a clear mandate for regional economic development, serving local industry and SMEs and engaging citizens. They address the immediate innovation needs of these actors, and are therefore well positioned to respond to individual regional challenges through short time-cycle applied research projects.
- UAS are well positioned to raise private & public R&D investment in their respective regional innovation ecosystems and can therefore enhance the innovation capacity.

4 European and Regional Challenges in the Innovation Area

4.1 European Challenges

European Challenges	How UAS strengths can contribute
Competing in the next technology wave	Taking advantage of European strengths in place-based innovation to shape the next technology wave. Driving the green and digital transitions in accordance with European values and the donut economy model.
Connecting innovation to welfare	Including users, but also researchers from all disciplines (including SSH and digital humanism) in the development of new technologies, services to industry and society. Ensuring that innovation fosters sustainability and inclusivity and addresses social needs.
Creating future dynamic economies	Using the UAS model to ensure that all actors (students, researchers, SMEs, industry and citizens) are included and engaged in addressing societal challenges and adopting new technologies. Creating dynamism through a sense of ownership of the challenges and empowerment to seek solutions.
Fostering diversity and inclusivity	Promoting diversity and inclusion in higher education by appealing to societal groups that previously had less access to tertiary education. New educational fields have

	been continuously integrated into UAS, which also attracts new groups of people and makes the overall innovation ecosystem more diverse. At the same time, gender, equality and diversity are subjects of research and thus also topics of teaching. In this context, UAS foster the development of female entrepreneurship.
Addressing the skills gap	Ensuring the quality of the vocational track through the promotion of innovation competencies and an entrepreneurial mindset in the binary higher education system in Europe.

4.2 Regional challenges

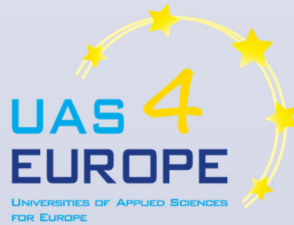| Regional challenges	How UAS strengths can contribute
Mitigating technology transfer weaknesses	Creating societal impact by valorising research outputs of direct and immediate relevance to Europe's economic and societal actors. Increasing the innovation capacity and culture of Europe's economic actors by accompanying them through digital and green transitions. Enhancing Europe's competitiveness through applied research.
Linking fragmented regional innovation ecosystems and promoting innovation cohesion	Acting as clear points of contact within and between innovation ecosystems. Rural regions are often neglected in research and innovation initiatives and approaches. A large part of the European citizens live in small and medium-sized towns and in rural areas. Many UAS are in small and medium-sized cities and are already addressing the need for innovation cohesion.
Promoting citizen science, open science and open innovation policies	Collaborating with citizens and regional public and private actors, thus promoting the citizens' engagement with science. Enabling inclusive knowledge sharing among different actors and particularly SMEs. Contributing to the future adoption, exploitation and diffusion of Open

	Science, Open Education and Open Innovation policies and frameworks.
Broadening participation in European programmes to include all types of applied research actors	Supporting capacity building and peer-learning among actors with constrained resources and limited European networks to facilitate stronger engagement with European initiatives.

5 Recommendations

Due to the good networking structures of UAS (organised in regional, trans-regional, cross-border networks), a higher attention of the Commission towards UAS will lead to disproportionately positive effects on the innovation and resilience capacities of the EU.

1. To **foster a strong European competitiveness in the incipient wave of technologies,** it is paramount that applied research be the transfer mechanism to develop and implement disruptive innovations. Higher Education institutions focusing on practice-oriented applied research should be better integrated into defining programme objectives, focus areas, call-design and evaluation. When applied to programmes developing and diffusing applied technologies, this will enhance the innovation capacities of Europe's private and public sector actors. Additionally, UAS support the digitalization agenda (by intense cooperation with SMEs) and their specific role within the digitalization instruments in place should be recognized; we should develop instruments well-adapted for UAS-municipal collaboration.

2. Innovation needs of SMEs, industry and societal stakeholders require a short time response. Universities of Applied Sciences can respond to these needs by their short cycle applied research projects. Shorter time frame support instruments would increase the ability of UAS to **create impact and strengthen the innovation capacity across borders**.

3. **Enable, empower and connect engaged researchers, entrepreneurs and innovators** from different backgrounds and across sectors, disciplines and generations, who integrate experienced research knowledge, open innovation skills and an entrepreneurial mind-set and who act challenge-based and always strive to transform their ideas, expertise and research into (added) value for society and businesses.

4. To **nurture the innovative entrepreneurs of tomorrow**, we should develop strong synergies between EU programmes addressing value-based entrepreneurship in all its facets, including collaborative, applied research activities in curricula. This could take the form of deeper links between ERASMUS+, COSME's successor programmes for entrepreneurs and the EIT. Building the skills, mindset and culture necessary to foster entrepreneurship are multi-faceted and this should be reflected in the cross-fertilization of existing and future programmes.

5. To **connect the complementary strengths of UAS and traditional research intensive universities**, the integration of UAS in the instruments of EIT KICs and the European Universities Initiative should be reinforced. Addressing the skills gap requires the contribution of all types of higher education institutions.

6. To ensure that **European values are promoted and integrated** in the development of the next wave of technologies, we should foster synergies with Responsible Research and Innovation programmes at the national and regional levels.

7. Support trainings and awareness campaigns to **enhance an exploitation-oriented approach among researchers**. Tight collaboration with industry in cooperative projects and funding schemes in applied R&D demands a thorough IP Management. Especially building capacities in open business models to valorise and the management of intellectual property rights shall be promoted.

8. Support seed-financing funds within the UAS to **bridge the gap between post-research activities and prototype development** up to the point that the IPR/prototypes can be either sold or a sustainable business development be implemented (e.g. within professional spin-off incubator structures).

9. The European UAS sector is heterogeneous in terms of size and volume of R&D activities and corresponding organizational structures. To **fully exploit the innovation potential**, targeted support measures for a basic establishment of Technology Transfer Offices (TTO) or further development of already launched TTOs might be helpful. This includes highly specialized Tech-Transfer experts as well as infrastructure, benchmarking and networking opportunities with TTOs of other Universities. At larger facilities even business angels could support the TTO-teams.

10. To **better connect Europe's innovation ecosystems**, a dedicated EU instrument should serve to establish a network of centres of expertise (supporting SME innovation across borders, challenge-based learning fostering innovative entrepreneurship, while promoting inclusivity and gender principles).

11. Integrate UAS in open science and open innovation initiatives and programmes with a leading role at regional levels in order to benefit from their capacity to collaborate in an open and inclusive way with many different local actors like SMEs, and to educate students and train workers promoting participation, collaboration and knowledge sharing as means to **address future professional challenges** and to **contribute to the development of an inclusive citizen science vision**. International collaboration will be key for a successful EIA implementation and should be a cross-cutting priority.

12. Develop support within the European Innovation Ecosystems (EIE) instrument to better connect actors within applied research across Europe to **seek synergies across national and regional innovation strategies**, including benchmarking activities and scaling UAS-led projects from regional to European levels.
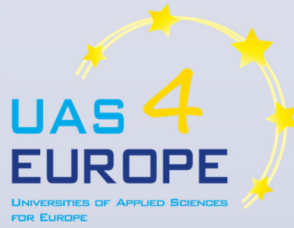
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D.Innova: Concept for the establishment of a German national agency for the promotion of innovation, knowledge and technology transfer

D.Innova is a proposal for an independent, national agency for the promotion of innovation, knowledge and technology transfer and applied research aimed at direct benefits. In

particular, it aims to promote the emergence and **further development of regional innovation ecosystems**. It is based on a holistic concept of innovation, which also includes social, ecological, sustainable and technical innovations. The understanding of innovation has fundamentally changed conceptually in recent years, but, as the German Council of Science and Humanities writes, this has not yet been reflected "in the breadth of the science system with its organisational structures and funding architectures". The **existing funding programmes in Germany do not promote innovation-oriented research** consistently and systematically enough. D.Innova aims to close this gap. As a national innovation agency, it sees itself as an essential extension of the German funding landscape: it is supposed to become an independent and permanent institution of the federal government. Instead of many small initiatives, it is intended to succeed in a targeted departure for the promotion of innovation ecosystems.

If established, D.Innova aims to

- support in particular those innovation-oriented R&D projects that are based on **regional cooperation and networking**. It is intended to facilitate sustainable, long-term, innovation-promoting partnerships between regionally oriented universities, research institutions and companies, but also civil society actors,
- use **application orientation and direct practicability** as essential criteria in its review processes. In doing so, D.Innova is committed to the global sustainability goals and sees them as the basis for sustainable economic structures and socio-ecological innovations,
- to give companies systematic access to national research institutions,
- to make research results further usable for others. In doing so, it particularly promotes projects with exceptionally **high innovation potential**, which are usually associated with a **high level of risk**,
- upgrade regionally oriented universities in their function as **innovation drivers** in local innovation systems,
- promote spin-offs from science,
- assist in the search for an implementation partner, in internationalisation and in the search for start-up funding, and to
- leave it to an **"innovation council"** to decide what is and what is not considered an innovation project.

Digital Innovation Hubs in Austria

With their **expertise and infrastructure**, digital innovation hubs led by Universities of Applied Sciences support Austrian SMEs in digitization. They offer a **wide range of services in the information, training and digital innovation modules** for the benefit of the target group.

The Austrian Federal Ministry for Digital and Economic Affairs (BMDW) and the National Foundation Research | Technology | Development support the establishment of national Digital Innovation Hubs (DIH). A digital innovation hub is a **non-commercially active competence network that supports SMEs in their digitization efforts.** Three DIH are funded in the first and three in the second pilot call:

- Digital Makers Hub [digitalmakershub.at]

- DIH-OST [dih-ost.at]

- DIH-WEST [dih-west.at]

- innov:ATE [dih-innovate.at]

- DIH SÜD [dih-sued.at]

- DIH Arbeitswelt KMU [dih.work]

BRIDGE: A national knowledge valorisation programme from Switzerland and its connection to UAS

BRIDGE is the joint programme of the Swiss National Science Foundation (SNSF) and Innosuisse, the Swiss innovation agency. Until 2017, researchers hoping to develop practical applications for their discoveries were unable to turn to the Swiss National Science Foundation (SNSF), because its core mission is to support research. By the same token, many projects were not yet sufficiently mature to benefit from the support of Innosuisse. It's this gap that BRIDGE fills, **by supporting the intermediate, precompetitive phase between research and innovation.** Thanks to BRIDGE, **both young and experienced researchers can develop innovative products or services with market potential based on their research findings.**

Why is BRIDGE a good practice?

BRIDGE consists of the two funding schemes "Proof of Concept" (PoC) and "Discovery". **PoC, on the one hand, targets young researchers**, including people who just finished their Master's or Bachelor's degree or their PhD, and has a shorter funding period (12 to 18 months). PoC helps young researchers with an idea **to develop their research results into a social or commercial innovation**. In four years, from over 120 PoC projects **more than 60 startups were founded**. Discovery, on the other hand, targets **more experienced researchers and especially research teams** and provides funding for a period of up to four years. Discovery **enables collaborations between UAS and research universities** to realize the innovative potential of scientific results. Today, Discovery accounts for ca. two thirds of BRIDGE's budget and is [open to all disciplines](#) since 2021. After the support by BRIDGE, it can, for instance, always move along to further funding opportunities (e.g. become an Innosuisse project), no matter whether the project was financed by the PoC or the Discovery scheme.

BRIDGE's success [became apparent fast](#): Launched in 2017, both BRIDGE schemes have met with great interest. Young researchers have submitted over 550 Proof of Concept applications in the first four years. Additionally, more than 350 proposals were submitted by experienced researchers to Discovery. This shows the **interest in receiving funding for projects in this precompetitive phase**.

Since **BRIDGE projects usually aim to have a transdisciplinary character** and the project managers collaborate closely with the public and the private sector, **UAS are both popular partners as well as applicants**. UAS project owners often not only already have an **idea how to implement their project** but also the **right network and potential industrial partners to do so**. For BRIDGE, UAS are important actors when it comes to addressing concrete needs of the industry and to finding practice-based solutions. Applicants from UAS **usually have close connections to their regional innovation ecosystem**.

BRIDGE is an example of how a **complete funding portfolio for all market-readiness levels**, which considers both fundamental as well as applied research, can foster innovation and knowledge valorisation.

SUPSI: Involved on different levels within the European Innovation Area – a good practice in knowledge valorisation

The scuola universitaria professionale della Svizzera italiana (SUPSI) is one of the eight UAS in Switzerland. Despite being a small University of Applied Sciences (UAS), compared to larger European universities and research institutions, SUPSI was strongly involved in past international R&I programmes. SUPSI has been an important contributor to previous framework programs up to Horizon 2020, as well as to Eureka initiatives, and is also an academic partner of the [EIT Manufacturing](#) community, contributing to the [EIT Manufacturing Master School](#) programme.

Why is SUPSI's innovation framework a good practice?

Firstly, SUPSI's comparative advantage in participating in European programmes can be traced back to **SUPSI's relatively early start in activities on the European level**, around almost 20 years ago. Compared with the other Swiss UAS', SUPSI has a long tradition in participating in European R&I programmes. Secondly, **SUPSI is a research-intensive UAS.** Currently, the Department for innovative technologies is involved in more than 180 projects and most of the academic staff is strongly active in research. Thirdly, **SUPSI's approach to research promotes the entrepreneurial thinking of their students and researchers**. The SUPSI graduates are heavily involved in SUPSI's research, in collaboration with the industry. At SUPSI, each researcher holds responsibility for their entire project. Through this, the researchers and younger assistants learn scientific management skills as well. Lastly, **SUPSI values lifelong training**, which fosters the innovation capacity of the whole region.

SUPSI's Department of Innovative Technologies pursues a strategy, through which they **prioritise SUPSI's participation in funding programmes and partnerships.** On the one hand, they consistently **focus their activities on specific technologies and sectors**. In particular, SUPSI's projects are concentrated mainly on AI and Manufacturing. Over the years, SUPSI established a strong network of partnerships in these sectors - on all levels of governance. This consistency has proven to be a good practice: roughly one out of three submitted projects receives EU funding. Roughly one third of the SUPSI's department of innovative technologies research budget is provided through EU funds.

On the other hand, **SUPSI strategically identifies whether a project will be effectively pursued on a regional, national or European level.** The TRL in each project plays an

important part in these decisions: depending on the expected time to market period, SUPSI will seek collaboration with the regional industry, with national funding schemes or submit them to European programmes. This ensures that SUPSI's applied research projects are transformed into market-ready products, which contributes to knowledge valorisation within the above mentioned industries. Due to this approach, SUPSI not only became an important and reliable sectoral partner, but is also strongly anchored in regional, national and European networks.

To sum up, there is an interrelationship between SUPSI's strategic and multi-level activities. SUPSI's partners benefit from the UAS' expertise in specific technological domains and industrial sectors, from its rich experience in applied research and in the participation in European R&I programmes. SUPSI, on the other hand, can strategically develop its skills and laboratories with the support of the different collaborations and funding programs.

Austrian Universities of Applied Sciences as Drivers of Innovation

Competing with the best

For Austrian UAS it is a matter to obtain research funds in competition with the best, as they only know this kind of research funding.

Stimulating private sector investment

UAS achieve high efficiency and high leverage when it comes to stimulating private sector investment, especially in the corporate sector. The Austrian UAS generate about 14% of their research revenue from cooperation with the business sector. Every year about 70 start-ups emerge from UAS.

From research to concrete products and services

UAS stand for application-oriented research. If you talk to business and industry, they value UAS as cooperation partners, precisely because they can analyse research results for concrete applications. They have a great deal of understanding and know-how when it comes to developing concrete products and services from research results. In so far UAS perform important transfer services.

Impact in the regions

Applied research at UAS has a direct impact on the population in the regions. The users/applicants are involved from the very beginning and thus they change from users to

designers. Consequently, research and teaching happen in line with the needs and requirements of the regional environment.

Evidence in facts, figures and data

Foundations (start-ups and spin-offs) per year

2020: about 70

2019: about 52

Number of research collaborations (research projects) with companies and SME share of the companies concerned

2020: about 1,660 (Share of SMEs: about 50%)

2019: about 1,600 (Proportion of SMEs: about 60%)

Number of students involved in research at the UAS

2021: about 1,700 FHK, September 2021

2020: about 1,000

Number of UAS graduates working in research

currently: about 450

Number of patents to date

Until 2021: About 105

Research activities and degree programs in the field of "Green Deal" and sustainability

The strong connection of UAS to society is exemplified by the high number of research activities and study programs in the area of "Green Deal" and sustainability. Currently, about 78 UAS study programs are thematically related to the area of "Green Deal" or the areas of environment, sustainability, global challenges. A survey by the FHK has shown that around 240 funded research projects currently being carried out at UAS fall into this area.

	Number of currently active research projects per area	Number of researchers per area	Future planned submissions per area
Clean Energy	42	101	31
Sustainable Industry –	76	104	42

Industry for circular economy			
Building and Renovation	42	46	5
Farm to Fork	22	44	15
Eliminating pollution	11	31	4
Sustainable mobility	43	81	43
Ecosystems and Biodiversity	4	6	1
TOTAL	240	413	141

Baden-Wuerttemberg's Centres of Applied Research and research and innovation networks: Examples how UAS can contribute to EIA

Two different structures are described as examples of existing excellence centres which can be used for transregional and international cooperation as contribution to the European Innovation Area.

1) Centres of Applied Research (ZAFH) in Baden-Wuerttemberg (Germany)

ZAFH are **centres of excellence** within the UAS in Baden Wuerttemberg. Selected on base of scientific assessment process, these centres are formed on topics with high scientific, economic or social impact ranging from Ambient Assisted Living technology, technologies for micro sensors up to research on urban energy systems and resources efficiency. ZAFH are consortia of typically 3 universities on specific topics funded for 6 years with state and EFRE funding.

2) Innovation and research partnerships formed within the BMBF programme FH-Impuls
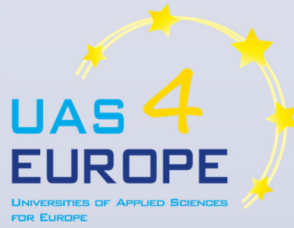
In a very competitive selection process 10 partnerships have been funded by the BMBF at UAS in Germany in 2017. **These partnerships form regional excellence centres with strong interaction in R&D of universities and industry.** A full list and description of these partnerships can be found here. **Such hubs in the regional innovation ecosystems can be made even more effective through the establishment of transregional and even EU-wide higher education and innovation alliances, contribution also to more cohesion amongst EU regional innovation ecosystems.**

Hightech Agenda Bayern: Promoting AI research and innovation (i.a. in UAS) in Bavaria

The Hightech Agenda Bayern was presented in October 2019 as a technology offensive, including an investment volume of 2 billion EUR for the period from 2019 to 2023. The state of Bavaria launched the initiative among others to accelerate research surrounding Artificial Intelligence (AI). The Hightech Agenda Bayern recognizes the role UAS play in this field and incorporates them in the initiative and its funding scheme. The offensive includes four programmes which interact with each other:

1) AI and super tech: quantum, aero and space, clean tech (investment: 600 mio. EUR) The technical UAS in Ingolstadt is host to the AI Mobility Node Ingolstadt. In addition to the professors already conducting research, a further 40 scientists will develop AI mobility research at the THI and accompany the transfer into applications. At the UAS in Schweinfurt, the Robotics Centre for Human-Machine Interaction in Schweinfurt was equipped with 260 study places. Furthermore, the Centre for Digital Nursing in Kempten with 210 study places was created at the UAS in Kempten and the Centre for Digitalisation technologies in Deggendorf was equipped with 1,000 new study places. Additionally, the "Medical Engineering" degree with 260 student places in Aschaffenburg was established.

2) Acceleration: investment in higher education infrastructures and faculties, incl. HR (volume: 600 mio. EUR). Different investment projects are supposed to improve the education and research infrastructures. For instance, the initiative will secure the funding for a new building for digital chairs at the technical UAS in Ingolstadt, the new Technology

Park in Rosenheim, a new building of the Centre for Entrepreneurs in Bayreuth or a new International Science Center in Passau.

3) Higher education reform: the Agenda seeks to increase research capacities (investment: 400 mio. EUR). The reform seeks to attract the world's best scientists, i.e. through creating new professorships. Universities and UAS should become more modern (e.g. more competitive), entrepreneurial (lower thresholds for professors to found or participate in start-ups and spin-outs), open and international (more degrees in English, promotion of Dual Careers).

4) SME offensive: supporting the economy with a digital fund, a start-up fund and an automobile fund (investment in total for all funds: 400 mio. EUR). Firstly, the digital fund (230 mio. EUR) enables companies to invest in digital innovations and processes. By the end of 2023, 25 technology transfer centres shall be financed. Secondly, the start-up fund (50 mio. EUR) offers financing to newly established companies in order to close the gap in the knowledge valorization process. Thirdly, the automotive fund (120 mio. EUR) seeks to promote e-mobility, plug-in as well as up- and re-skilling of workers in the industry.

Future Code Bayern: UAS response to the Bavarian Hightech Agenda

Future Code Bayern can be considered as the response of the Bavarian UAS to the Bavarian Hightech Agenda launched in 2019. Future Code Bayern is a virtual platform, where researchers in applied science can present their research and collaborations related to digital transformation, demographic and climate change. Their projects are clustered in nine topics:

- Robotics (B.ROB)
- AI mobility applications (B.MOTION)
- Livelihoods, resources, environment (B.LIFE)
- Cybersecurity (B.SECURE)
- Healthcare (B.CARE)
- Knowledge transfer (B.TRANSFER)
- Digital transformation, demographic chance, ecological systems intelligence (B.TOP)

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- Digital literacy (B.LAB)
- Openness to regional, urban environments and international partners (B.OPEN)

In each of these topics, the UAS' strengths as application pioneers, collaboration partners for industries and international research partners and as the driving force behind market-relevant AI mobility applications and high-tech innovation leaps are highlighted and incorporated.

Taskforce for Applied Research SIA: funding and internationalisation of applied research

An example of a funding programme for applied research projects can be found in the Netherlands. The [Taskforce for Applied Research SIA](#) (or Regieorgan SIA) strives to **improve the quality and increase the impact of applied sciences in the Netherlands**. Their largest funding programme is called "RAAK". In the RAAK programme, universities of applied sciences **play the role of R&D departments for SMEs and public organisations** that lack their own R&D department.

SIA funds the research itself, as well as the creation of networks and platforms. Applied research helps solve societal and economic issues. Against this backdrop the Taskforce's goal is to **interconnect these issues and universities of applied sciences more strongly**. They do this by bringing people, organisations and policy-makers together. As a network organisation, **they operate at regional, national and European level**.

Why is RAAK a good practice?

The RAAK programme consists of three schemes:

o **RAAK PRO funding**: large, applied research projects with a duration of 4 years, open for consortia consisting of universities of applied sciences, public organizations and SMEs,

o **RAAK Publiek funding**: projects (2 years) in applied research for consortia consisting of universities of applied sciences and public organization, and

o **RAAK MKB funding**: applied research projects (2 years) by consortia consisting of universities of applied sciences and at least 6 SMEs.

All RAAK projects are based on questions arising from **problems or issues in a professional practice**. The research output can lead to a prototype, a new method or other tangible result, but also contributes to the quality of higher professional education. Each year, the RAAK award honours the best project with 10.000 EUR. With the Delta Prize, SIA honours two UAS professors to highlight the (societal) impact of practice-based research.

Regieorgaan SIA stimulates the internationalisation of applied research. This both improves the quality of the research and helps it have a greater impact. It also facilitates the sharing of knowledge, offers new opportunities for talent development and can lead to the funding of applied research internationally. Issues arising from the field that call for collaboration with international entities are usually the trigger for the internationalisation of research. Equally, **an international issue may call for a regional or national contribution from the Netherlands**. There are already several good examples of successful international collaborations in applied research. Universities of applied sciences in the Netherlands, and particularly those along the borders, work closely with German or Belgian partners.

In the coming period, Regieorgaan SIA will focus on **connecting relevant stakeholders to make international applied research possible**. Furthermore, they will encourage the internationalisation of research via their existing funding programmes, and by becoming a partner in European programmes, for example via the European Partnerships.

NTN Innovation Boosters

The [NTN Innovation Boosters](#) (NTN: National Thematic Networks) are Swiss programmes that support SMEs in finding the right partners and developing their innovation ideas. For the period between 2021 and 2024, there are **[12 NTN Boosters](#)**. [Innosuisse](#) supports NTN Innovation Boosters**, which bring together key actors from research, business and society in Switzerland around an innovation topic and stimulate the development and testing of radically new ideas in interdisciplinary teams.**

Together with all interested actors, the NTN Innovation Boosters **formulate concrete working topics within their respective innovation themes** and **develop them in interdisciplinary innovation teams**. They teach the teams methods for agile ideas development. They support promising innovation ideas with **direct funding contributions**.

Selected teams can use them to test their hypotheses and work out a basis for decision-making in order to further develop their idea or to have the necessary expertise to know when to abandon it. Furthermore, the NTN Innovation Boosters **assist successful innovation teams in initiating projects** for which they can request support from Innosuisse or other public and private bodies (e.g. innovation mentoring).

Taskforce Knowledge Transfer Centres in Austria - Wissenstransferzentren (WTZ)

With the creation of [three regional knowledge transfer centres](#) (WTZ East, WTZ South and WTZ West), Austrian universities (Universities of Applied Sciences as well as to traditional universities) **make their contribution to intensifying the transfer of knowledge from science to industry and society**. All research initiatives and projects funded within the WTZ-framework must be aimed at the transfer of innovation. The duration of the WTZ is limited to the end of December 2021. The Knowledge Transfer Centres are funded with resources from the National Foundation for Research, Technology and Development - Austria Fund (sources from the Federal Government).

Thematic Focus Areas and main Initiatives - examples

1. Transfer Hubs

The cooperation project "Transfer HUBs" focuses on new and innovative knowledge transfer activities between universities and society. The focus is on cross-disciplinary and cross-regional collaborations with added value for society.

2. Innovation Matters

The cooperation project "Innovation Matters" is dedicated to supporting knowledge exchange to solve societal challenges and promote social innovation, with the active involvement of transfer partners from business and society.

3. Transfer Impulses

In the Transfer Impulses cooperation project, the handling of intellectual property in the context of knowledge and technology transfer is to be professionalized, long-term cooperation between science and industry is to be initiated. Competences in handling usable

research results in the art, arts-based research, the humanities, social sciences and cultural studies are to be expanded.

4. Exploitation channels 2.0

The exploitation of research results is primarily thought of in terms of publications and patents. However, universities also possess numerous types of intellectual property apart from these, which have a high potential, both financially and socially. The goals of this collaborative project are: Strengthening the exploitation of research results through innovative ways of exploitation; Immediate exploitability of results from artistic research; Building infrastructure and expertise in the exploitation of biomaterials; Raising awareness among researchers for alternative exploitation options.

5. Entrepreneurial ValueChain4Universities

The successful commercialization of project results especially by way of a start-up requires the combination of at least the three "components": A "good" project content (research result, project outcome, product concept etc.), a person who is willing and able to drive the project forward and a capable and motivated founder personality. The goal is to enable successful commercialization where these components are not available.

6. STEM4School: Structured and sustainable enthusiasm initiative for technology

Many future technologies create new possibilities and are already being used to manufacture products. To foster an understanding of these technologies and enthusiasm for technology and the natural sciences, the participating universities in the MINT4School project present interesting technologies to teachers and student teachers in the science laboratories and demonstrate their areas of application.

7. Connecting.Ideas4Research: Participative inter- and transdisciplinary knowledge transfer processes between research and communities of practice

Universities today are confronted with increasingly complex demands - e.g. digitization, the emergence of new disciplines, exploitation orientation, or transdisciplinarity - that reveal opportunities but also point to adaptation needs. "Connecting.Ideas4Research" explores two promising approaches regarding these challenges: Engaging communities-of-practice and addressing the ethical implications of digitization for research practice.

8. Business and Industry Cooperation Project

Contact with local and international business and industry serves as an essential element in knowledge and technology transfer at universities. The common goal in this project is to
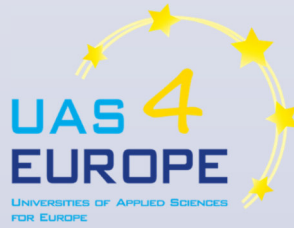
expand cooperation between universities and business and industry, initiate joint research projects and thus provide important impetus for knowledge and technology transfer. The following measures, among others, are planned for this purpose: Further development of the Entrepreneurship Online course, implementation of a seminar series on the pharmaceutical value chain, events on funding for university-business cooperation, holding a career summit and workshops on knowledge transfer through Connected Learning.

Danske Professionshøjskolernes and the LEGO Foundation: Co-Creation to develop innovative teaching methods

UAS in Denmark collaborate with the LEGO Foundation in the education programme "Learning through Play". So far, the LEGO Foundation has provided over 57 million Danish Krones (ca. 7.5 million EUR) for this programme in Denmark. The goal is to **improve the daily life of children in schools and kindergarten**. The programme is a **co-creation process between UAS and the LEGO Foundation** and focuses on the strengthening of the professional didactics towards more experimental and engaging approaches. The LEGO Foundation highlights the importance of play in the development and learning process of children. **UAS help translate the newest research results into professional didactics.** Through test runs, playful teaching methods are tested and experiments in so-called Play Labs show the significance of good learning environments for high-quality education. Finally, the aim is to teach children in an age-appropriate and engaging way.

2019, the collaboration between Danish UAS and the LEGO Foundation was enhanced with 24 million additional Danish Krones (ca. 3 million EUR). **The UAS focus on building research competences and practice-based knowledge to develop professional didactics**. The aim is to analyse how "Learning through Play" can be integrated into the education of future teachers. For this purpose, UAS examine all the problems that future teachers and educators will face in their daily lives.

9 Senior Researchers and 12 PhD fellows could join the project in 2019. They are working on deepening the "Learning through Play" programme and building capacities in the teaching schools. All 36 ambassadors at the six UAS support the project and serve to help influence colleagues and they in turn influence the students who will be transmitting the new

experimental and engaging approaches to future generations of children and youth out in schools across the country.

On such a long-term perspective, when the project is completed, the schools may not be fundamentally transformed, but **new teachers will hopefully have taken on board innovative didactic methods and approaches**. In this way, a sustainable development of knowledge at teaching schools can be established.

WeRin: Women Entrepreneurs in Regional Inclusive Entrepreneurial Ecosystems

Women represent about 60% of higher education graduates, their under-representation amongst start-ups is a clear challenge. Despite a rise in participation of female students in entrepreneurship education at Higher Education Institutes (HEI's), they are behind compared to their male counterparts. Even when they have participated in entrepreneurship education, they are less likely to move towards entrepreneurial careers after graduation. If they do, these graduate female entrepreneurs are less embedded in the regional entrepreneurial ecosystem: fewer of them participate in local incubation and acceleration programmes, seek and receive funding and are active in regional enterprise networks.

WeRin is a programme funded by the ERASMUS+ Knowledge Alliance programme, the Women Entrepreneurs in Regional Inclusive Ecosystems – WeRin Project unites fourteen partners from network organizations, associations, research institutes, academia and businesses based in six countries in Europe. Their expertise and strong reputation make a solid foundation for successful achievement of the intended project results.

The WeRin's aim is to **increase the share of female graduate entrepreneurs and ensure they are firmly integrated in regional entrepreneurial ecosystems across Europe**. Furthermore, entrepreneurship education and support programmes from a gender and structural perspective should be fostered. Additionally, to goal is to **make women feel invited to the entrepreneurship scene**, while going beyond the boundaries of Higher Education into their regional entrepreneurial ecosystem, and to ensure that female entrepreneurs can become a key part of these.

Their audience are entrepreneurship educators (professors, lecturers, mentors, coaches) and Entrepreneurship Programme Managers in HEIs, incubators of the university, and in non-academic organisations in charge of promoting and supporting entrepreneurship in the broader regional entrepreneurship ecosystem.

With tangible targets, **WeRin plans to increase the share of female participation in entrepreneurship education by 15% and in entrepreneurship support programmes by 20% within three years of project completion.** WeRin provides opportunities for educators, policy makers, funding bodies and those working to increase the number of female entrepreneurs. **WeRin will highlight good practices in the regions, carry out a regional analysis of gender inclusivity, organise events including, international capacity building sessions and communities of practice.**

Herääpahvi! A best practice project that integrates different actors of the innovation ecosystem

HerääPahvi! -project **combines the competence of creative industries with bioeconomy and circular economy and their latest inventions**. The aim of the project is to develop cutting edge and competitive expertise for the development and commercialisation of food packaging that is using the side streams of industry. Forest industry and food industry both create a number of side products that at the moment are used either as energy or are composted. They contain a number of bioactive compounds that could be utilised in, for example, packaging paper or paperboard. In the project, new packaging concepts with functional qualities will be developed.

The central idea of the project is that by integrating design, media, branding and storytelling into all stages of the product and service development of packaging materials the possibilities of commercialisation will increase and **new competence will be developed for all concerned.** The project will **widen and deepen the interaction and cooperation between creative industries and the forest bio sector**. The experts in creative industries will learn to **identify the possibilities of the technical innovations** in biofields. The technical experts, on the other hand, will learn to **appreciate the importance of design and marketing**. This will benefit both parties.

As a result of the project, a new ecosystem of forest bio industry, design and media will be created. **This will immediately increase the possibility of profitable business for all**. The different parties will learn the value of packaging that uses the side streams of industry in creating brands. A short term effect will also be the increasing awareness of produces and consumers concerning products that utilise the side streams. **This will enable the increase of the number of solutions that are in line with sustainable development.**

The long term effects of the project will be the **increased use of renewable resources and side streams.** The requirement for this is the creation of industrial ecosystems where raw materials are directed to the most efficient use possible rather than immediate end use like bioenergy. The project aims to show the benefits of this as well as the increase in market value, the challenges of packaging in future as well as the expectations of consumers. Particularly plant biomass is seen as having great potential. The conversion of side streams into more valuable end products will bring work and income to every part of the chain. The tracing of the side stream is seen as a significant competitive.

Overarching goals of the project:

1. Creating a functional national ecosystem of the forest bioeconomy and creative field, especially media.

2. Enhancing the know-how in packaging and circular economy in the creative field, and allowing the creative field to perceive the business potential in the innovations of bioeconomy.

3. Commercialisation and advancing of new packaging products that utilise side streams with the help of the creative field.

SMARTUP St. Pölten

SMARTUP St. Pölten supports innovation, entrepreneurship and startups in the regional innovation ecosystem of the Lower Austrian capital city St. Pölten. The initiative brings together key actors from regional business and society, (higher) education and research, innovation and entrepreneurship. It is funded by the city of St. Pölten and coordinated by St. Pölten University of Applied Sciences. It promotes an intensive knowledge exchange

between manifold stakeholders, provides research and innovation services, supports upcoming startups and hosts innovation events, like hackathons, bootcamps and idea-labs.

CPI – Creative Pre-Incubator in Lower Austria

The CPI – Creative Pre-Incubator is an initiative developed by St. Pölten University of Applied Sciences together with accent Gründerservice GmbH to promote entrepreneurial activities among students and young alumni. The initiative started in 2014. Due to it's success, it has now been extended to all Universities of Applied Sciences and several other HEIs in the province of Lower Austria. Teams apply with specific business ideas. The budding startups selected by the jury get support in the specification and further development with individual coaching and targeted workshops and can use the CPI co-work space free of charge.

IMM Future Tech Bootcamp

Within the framework of the IMM Future Tech Bootcamp, top industrial companies facilitate the entry into the joint co-creation process by inviting and supporting innovative makers – start-ups, SMEs, freelance developers, students and pubils – bringing together the different fields of expertise. Solutions for specific problems or current challenges of the industry, new application options or business areas for existing products, solutions or ideas as well as ideas for innovative products, solutions or business models with future potential are developed during four intense days of co-ideation and co-creation. The initiative started 2019 as a collaboration between IMM – Industry Meets Makers and St. Pölten University of Applied Sciences, but integrates several universities, maker spaces, some leading companies, start-ups and connects regional innovation ecosystems all over Austria.