UAS 4 EUROPE

Universities of Applied Sciences for Europe

A UAS'ers guide to building innovation ecosystems

Context

UAS4EUROPE has welcomed the initiative of the European Commission (EC) to create a European Innovation Agenda (EIA) since the very beginning, and is keen to further contribute to its successful implementation. In response to Commissioner Gabriel's initiative to establish a single market for European innovation, UAS4EUROPE published an open letter to the Commissioner on 29 April 2021, highly appreciating the Commissioner's invitation for consultations on the implementation of the EIA and presented its Innovation Action Plan, which delivers concrete recommendations on the realisation of the EIA, on 8 October 2021. In the following months, the UAS4EUROPE innovation expert group remained active in the consultation process leading up to the publication of the EIA on 5 July 2022.

This paper is delivered in the context of the publication of the Renewed European Innovation Agenda on 5 July 2022 and prior the Council Conclusions on the European Innovation Agenda, expected to be adopted by national research ministers on 2 December 2022.

At the EIA's centre are the five flagships on improving access to finance, increasing use of regulatory sandboxes and public procurement, accelerating and strengthening European innovation ecosystems, attracting deep tech talent and improving policy support to Member States. UAS already contribute to the implementation of at least three of these flagships, namely on connecting innovation ecosystem actors within and across regions, fostering the talent of tomorrow through practice-based research and training, and the set-up of experimentation spaces for students and start-ups.

While the EIA aims to maintain and further promote Europe as a global innovation leader, UAS play a unique role in the European innovation sphere. Not only do they train the talent of tomorrow by challenge-based research and training, but they actively act as *intermediaires* or interconnectors of innovation actors within and beyond their regions.

This paper displays how UAS already contribute to fostering innovation in Europe and serves as a basis for constructive engagement for the implementation of the EIA.

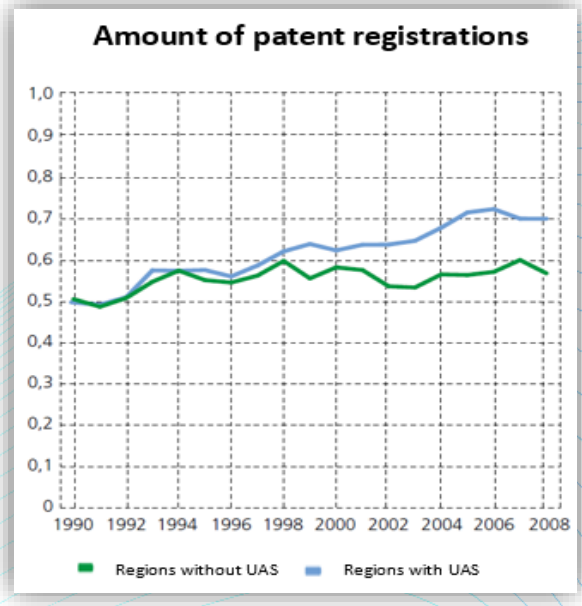
Content

Quantitative evidence of UAS in innovation ecosystems

The establishment of UAS helps foster innovation outside major innovation centres, often in close collaboration with SMEs, who intensify their applied research by exchanging knowledge with the UAS, as well as by training and employing their graduates. Hence, UAS are key actors in regional development by boosting the innovation capacity of regional actors. How to measure the effect of a UAS on regional innovation capacity?

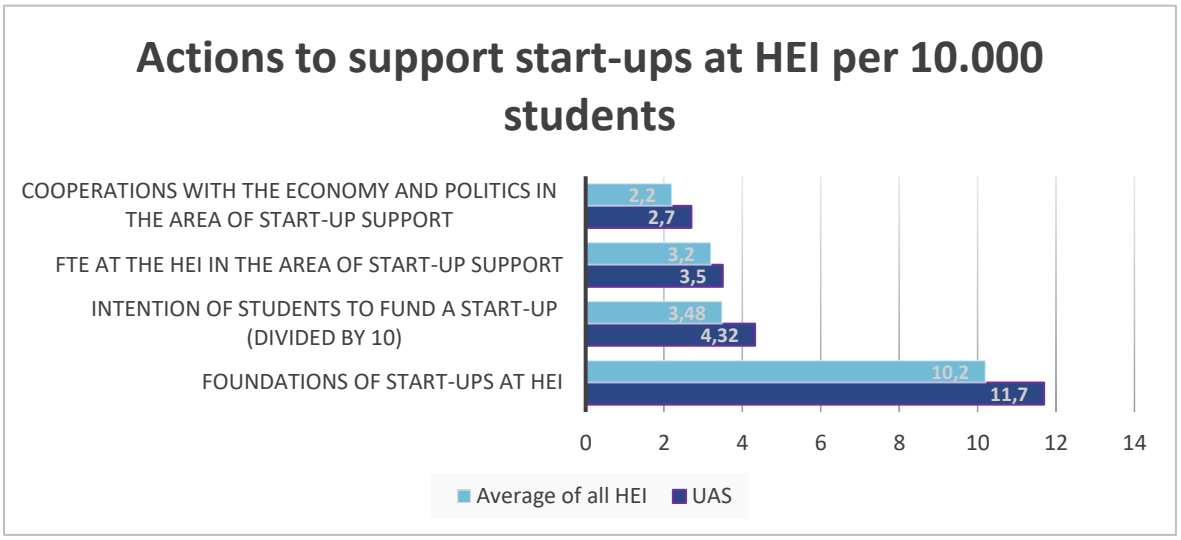
> *Regions where a UAS was established saw a positive quantitative and qualitative effect on innovation-related activities.*

A study about the 'Regional Innovation Effects of Applied Research Institutions' from Switzerland measures the patent developments after the establishment of a UAS. Findings show a 6.8% increase in regional patenting activity (i.e., quantity) and an increase in patent quality of up to 9.7%, measured by patent family size and the number of claims and citations per patent. Innovation effects can be measured through patent data, as they provide comprehensive information on the emergence of new technologies. Hence, the significant rise in patent numbers shows that regions where a UAS was established saw a positive quantitative and qualitative effect on innovation-related activities.



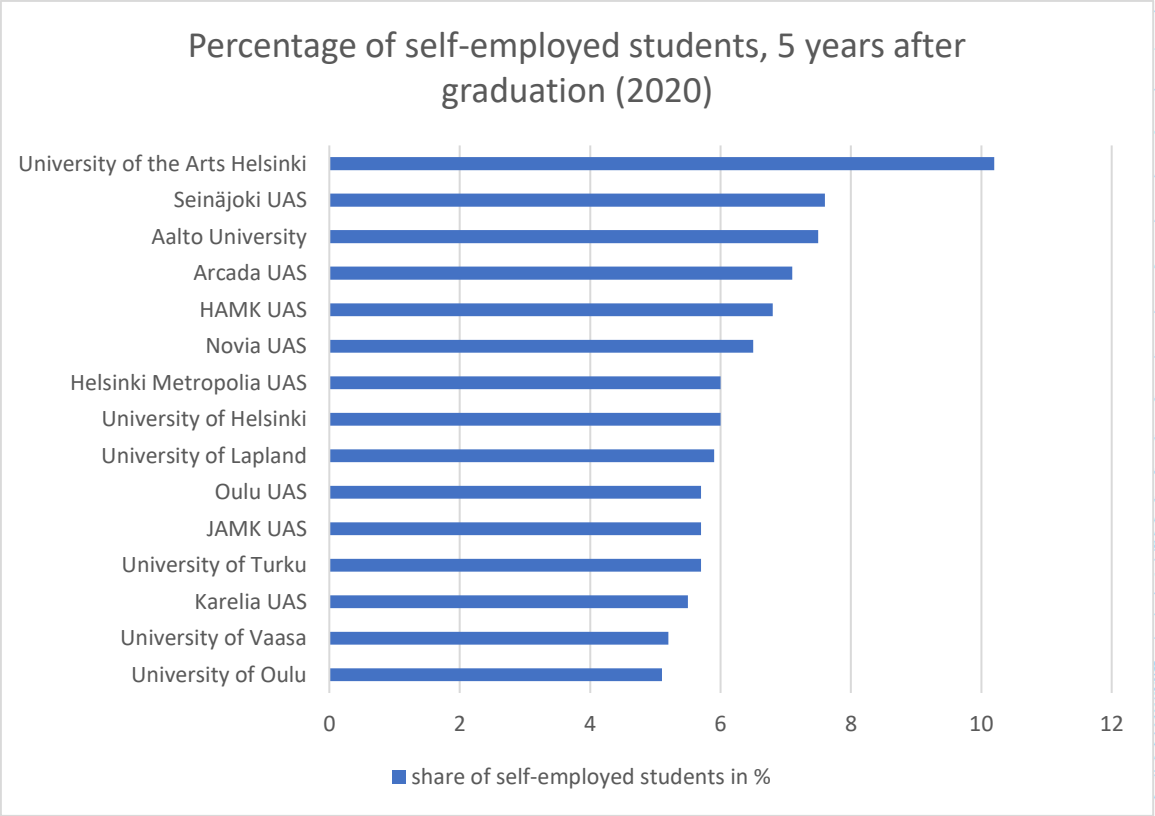
Another aspect of innovation beyond intellectual property is entrepreneurship. In Germany, the so-called Gründungsradar (start-up radar) measures the numerous efforts made by Higher Education Institutions (HEIs) to produce start-ups and innovative business models to increase the knowledge transfer from HEIs to society.

> *The start-up radar demonstrates that UAS are uniquely focused on creating an entrepreneurship culture.*



The figure above shows that UAS led the higher education sector in start-up creation and support. HEIs, particularly UAS, cooperate with the economic and political actors to increase the general ability to create start-ups.

In Finland, UAS in 2020 constituted the majority of the top 15 higher education institutions in terms of entrepreneurship outcomes (see figure below).

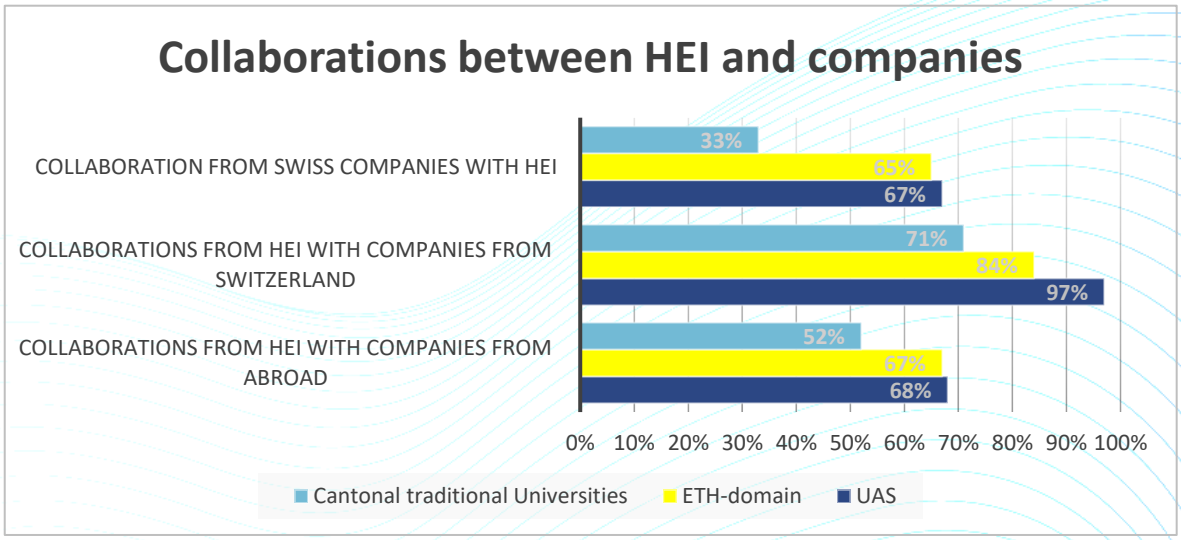


The data from Germany and Finland therefore demonstrate the deep-seated entrepreneurship culture at UAS.

> *The very strong collaboration with local companies and the focus on SMEs demonstrate how deeply UAS are linked to their regional innovation ecosystems.*

Complementary to intellectual property and entrepreneurship, a third way in which UAS support regional innovation capacity is by functioning as the de-facto R&D department of local or regional SMEs, helping them find technological solutions to business challenges.

According to the federal report on 'Research and Innovation in Switzerland 2020', Swiss SMEs disproportionately collaborate with UAS in their regions, whereas traditional universities focus on large industry and international partnerships (see figure below).



The very strong collaboration with local companies and the focus on SMEs demonstrate how rooted UAS are within their regional innovation ecosystems.

Nevertheless, a lack of resources and, associated therewith, a comparative disadvantage in successfully applying for highly competitive EU tenders, are often significant challenges for UAS. The EIA could be a great chance to help provide these resources to boost EU-wide knowledge and technology transfers.

UAS in practice – How to build innovation ecosystems

The statistics above demonstrate that the presence of UAS in their regions not only increase their innovation potential, but have a concrete and statistically significant impact on innovation output.

While UAS have started to be established in the latter half of the 20th century in the DACH region[1], they are nowadays spread all over Europe with a strong focus on challenge-based research and training. Today they account for a growing number of students with a strong participation, also from non-academic backgrounds.

The following best practices have been collected among the UAS4EUROPE membership and highlight how UAS already cover the ambitions of the EIA through European networks and projects. At the centre of these best practices lies the common characteristic of interconnecting different ecosystems with a strong emphasis on supporting deep tech innovation and entrepreneurship.

The portrait of E³UDRES[2] shows how UAS bring to bear their strengths as collaborative platforms, and connect across Europe, leveraging European programmes, in particular the European Universities Initiative.

Start for Future equally shows how UAS can develop together a truly European entrepreneurship platform, leveraging other ecosystem initiatives such as the EIT KICs.

The two following examples from the Netherlands and Finland illustrate how UAS are key players in enabling SMEs to navigate the digital transition. The Dutch Centre of Expertise Applied AI coordinated by Amsterdam UAS as well as the Finnish FAIR digital innovation hub demonstrate how UAS complement ideally the role of traditional universities and large research organisations, and connect to moderate innovation regions.

Two Swiss examples show the key role in regional deep tech ecosystems in ensuring an effective knowledge transfer by keeping close and deep relations with relevant industry actors, respectively looking at Bern UAS as the leader of the Swiss battery technology alliance and the UAS and Arts Northwestern Switzerland in the Basel Life Sciences Ecosystem.

Finally, an Austrian example displays the role of a rural UAS in the Burgenland region that set up a research centre to ensure a successful energy transition with and for their region.

The best practices have been collected through interviewing the respective representatives throughout the month of November 2022.

[1] Germany, Austria, and Switzerland

A portrait of E³UDRES²

Interview with FH-Prof. Dipl-Ing. Hannes Raffaseder, E³UDRES² Lead Coordinator & CEO, St. Pölten University of Applied Sciences & Board Member, EURASHE

What is E³UDRES²?

E³UDRES² is one of the leading European University Alliances in the field of innovation, made up of nine higher education institutions aiming to help small and medium-sized European cities turn into 'Smart & Sustainable Regions': Regions that are future-proof, offer the best possible quality of life for its citizens, and stand for a progressive European society. Hannes Raffaseder, CEO of St. Pölten University of Applied Sciences (STPUAS), is one of the driving forces behind E³UDRES² as its co-initiator and lead coordinator. He understands UAS "as platforms for collaborative innovation", which perfectly matches the idea of the European University alliances. Hence, he wanted to participate and started looking for fitting partners, found them, turned their weaknesses into their strengths, and built an alliance of small UAS. Because "small is beautiful, small is flexible, small is agile and gives us the possibility that we are really close to the people".

What does E³UDRES² want to achieve?

Raffaseder explains that through E³UDRES², he "wants to achieve impact on regions and Europe, and as we are facing so many challenges today, a European approach is the only way to do so". E³UDRES²'s vision and mission are based on co-ideation and co-creation, which takes a bit longer but is essential for open innovation and a diverse community that "is key for innovation". E³UDRES² connects comparatively small but agile, regionally anchored HEIs and their ecosystems. They aim to integrate challenge-based education, mission-oriented research, human-centred innovation, and engaged knowledge exchange to promote regional innovation ecosystems and pan-European collaboration. By doing so, they not only contribute to the high quality of life and European cultural identities but also significantly contribute to the European economy through regionally anchored SMEs.

What is the specific role of the UAS within the innovation ecosystem?

Raffaseder, a musician himself, compares the unique role of UAS to the role of a composer as "to compose innovation ecosystems, the balance between the different instruments is crucial, and one needs to bring the right instrument at the right place at the right moment", which is precisely what he wants to achieve through E³UDRES². Hence, the regionally well-connected UAS bring all actors from their innovation ecosystem together, provide them with the necessary knowledge and support and link them with international partners contributing to regional development through international teams.

> *To compose innovation ecosystems, the balance between the different instruments is crucial, and one needs to bring the right instrument at the right place at the right moment.*

How does E³UDRES² connect to other ecosystems across Europe?

E³UDRES² builds all its activities, like I-living labs, bootcamps, hackathons or iResidencies, on interdisciplinarity, innovation, inspiration, interaction, internationalisation and interculturality. All programmes are organised with various regional stakeholders, students, and staff from new European regions, who work in interdisciplinary teams to solve current challenges. E³UDRES² also strengthens its innovation capacity by joining forces with other European initiatives like the University-Industry-Interaction-Network (UIIN) or the European Institute of Innovation and Technology (EIT), with whom E³UDRES² builds its Entrepreneurship & Innovation Network for Smart and Sustainable Regions (E.I.N.S.) that pushes entrepreneurial education to the next level, co-creates advanced support for

innovation and business creation and enhances collaboration across the knowledge square. Also, they empower creative 'Ent-r-e-novators' (entrepreneurs, researchers, innovators, educators, and intermediaries) and create regionally anchored but globally connected institutions as key contributors to European green and digital transformation.

How can further partners get involved?

E³UDRES² constantly seeks further cooperation with industries, small SMEs and bigger ventures. Raffaseder "would also like to see more cooperations with networks like UAS4EUROPE or EURASHE to intensify knowledge exchange in a multidimensional way". E³UDRES² remains an open alliance, but "as learning processes need time, it cannot grow too fast". However, cooperations with other alliances or partnerships, especially with widening countries, are recently discussed, and Raffaseder is confidential that they "will find ways in the end".

A portrait of Start for Future

Interview with Prof. Dr. Klaus Sailer, CEO, Strascheg Center for Entrepreneurship & Professor, Munich University of Applied Sciences

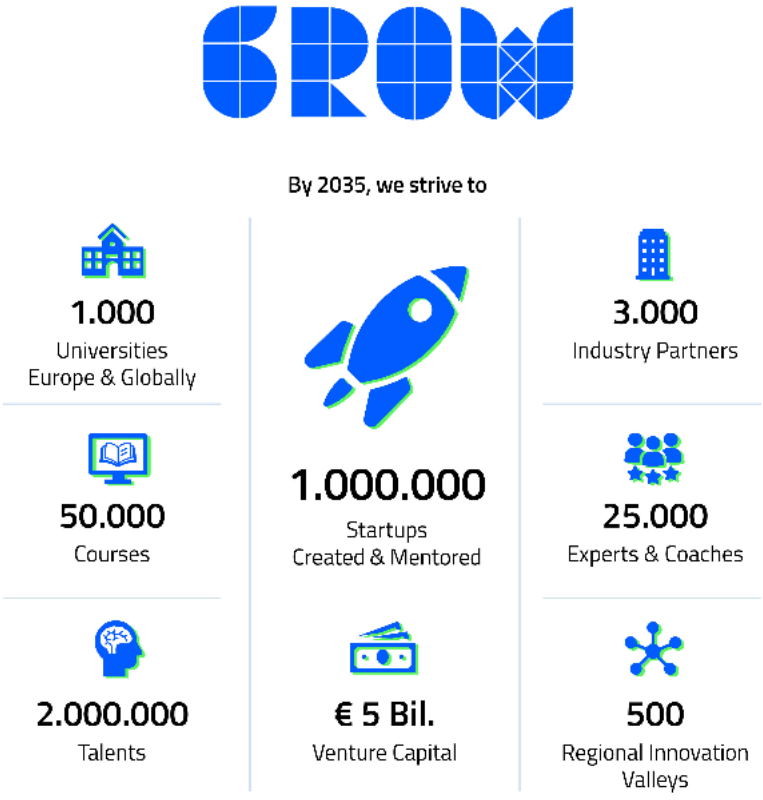
What is Start for Future?

Start for Future is an open alliance of academia, start-ups, industry, and public organisations which serves as an open entrepreneurship hub driving systemic innovation internationally. The initiative goes back to Falk Strascheg's idea that "creating successful start-ups is never a question of ideas, but of the entrepreneurial mindset". Klaus Sailer, Professor for Entrepreneurship at Munich University of Applied Sciences (MUAS) and CEO of the Strascheg Centre for Entrepreneurship (SCE), explains that the SCE was founded based on this idea and then after having built its local and national ecosystem, combined forces with 12 other Higher Education Institutions (HEIs) and established a programme based on learning, matching, and co-creating. Sailer explains that after a while, "EIT Mobility and Manufacturing approached us and offered us to participate in the HEI Initiative". After a year, they combined the projects, leading to Start for Future. Later, they integrated another EIT Call to combine ecosystems and the teach-the-teacher academy. Sailer describes the current project as "a combination of our Open Incubation Programme, covering everything from scouting to matching to co-creation with companies and regional ecosystems, our Open Incubator, providing access to market insights, partners and finances, our Regional Innovation Valleys programme creating regional ecosystems and connecting them with other innovation ecosystems and finally the education part through our Academy".

> *Europe needs all its talents that bring together all kinds of different approaches and should not make the same mistake as the US, which focuses only on unicorns or China that links support to party membership.*

What does Start for Future want to achieve?

For Sailer, the project's most important goal is "to demonstrate how to keep ecosystems alive, which is why we are driven by the European idea to democratise entrepreneurship". This democratisation is crucial as "Europe needs all its talents that bring together all kinds of different approaches and should not make the same mistakes as the US, which focuses only on unicorns or China that links support to party membership". Concerning the European programmes, Sailer explains that their approach is unique, as they "do not compete for different Calls every time but combine various Calls to grow and build a stronger ecosystem". Even though this takes some time, Sailer remains motivated as he "can see that I can really make an impact and change something in Europe and put a little help to build a society which guarantees intergenerational fairness".



What is the specific role of the UAS within the innovation ecosystem?

In the past, many UAS did not collaborate with traditional universities as they got much more funding and were therefore not to compete. However, Sailer emphasises that "nowadays, this is changing towards the question of how to link networks and build regional ecosystems with specialisation. This is the domain where we do not only rely on deep research but also applied science." Sailer sees this as "a chance to build on and perhaps take UAS to the next level". In general, competing makes no sense because everyone can profit more if we start to collaborate more closely. In the end, there is just one ecosystem, and the goal should be to take as much out of it as possible which works best through collaboration because "when we work together, the cake gets bigger or is even for all of us".

How does Start for Future connect to other ecosystems across Europe?

According to Sailer, one of Start for Future's responsibilities is to bridge different ecosystems. Especially when it comes to the widening countries, a unique approach was developed "to create ecosystems where we can learn from each other and increase entrepreneurial thinking as there is a huge potential". Often, entrepreneurship is still understood as something one can study theoretically, but in these ecosystems, it is more about training an entrepreneurial mindset through project-based learning. One example is Varna, Bulgaria, where the projects are flourishing, and they built an exemplary innovation hub. However, Sailer adds, "they would never call themselves an innovation valley but rather an innovation port as the city is close to the sea".

How can further partners get involved?

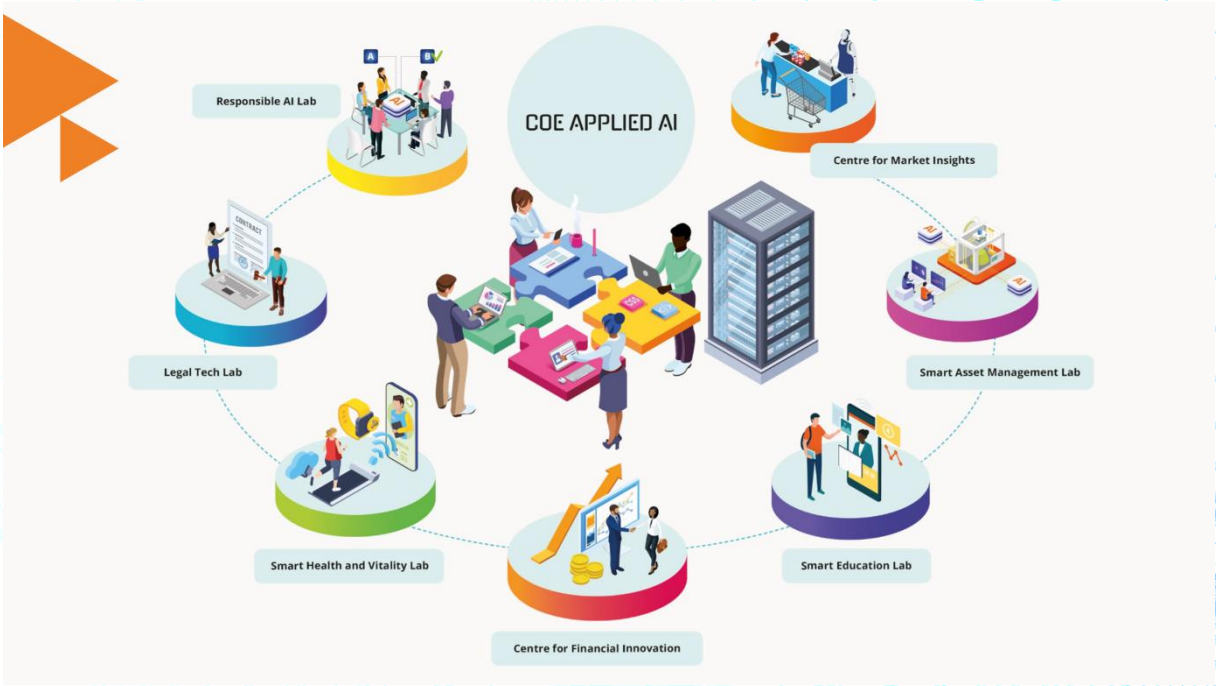
Since the project started in 2019, many new partners have been required, which led to the title of the "fastest-growing open alliance of academia, start-ups, industry and public organisations". However, Sailer emphasises that "it takes time to build something if you want it to be sustainable. Often, there is a time delay between the action and the results. Hence, one needs to keep going despite no immediate results." By 2035, Fit for Future strives to create 500 regional innovation Valleys, educate 2.000.000 talents with 1.000 HEIs and 3.000 industry partners, and create and mentor 1.000.000 start-ups. To reach these goals, the alliance is open for anyone to join.

A portrait of the Centre of Expertise Applied AI

Interview with Geert Wissink, Program Manager, Centre of Expertise Applied Artificial Intelligence, Amsterdam University of Applied Sciences

What is the Centre of Expertise Applied AI?

The Centre of Expertise Applied Artificial Intelligence (CoE AAI) is part of the Amsterdam University of Applied Sciences (AUAS). Geert Wissink, program manager of the CoE AAI, explains that the whole programme "is built on the different innovation ecosystems of the departments as in each of them exists an independent so-called LAB, where research is conducted at the interface between AI and the corresponding area of application". These LABs are long-term collaborations between research groups, degree programmes and external partners such as commercial businesses, NGOs, the government and academic institutions. The core team of CoE AAI brings them all together and, as Wissink describes it, "guarantees the matching of use cases, technology companies and the regional and AI landscape". For example, he describes a case where they were approached by the municipality of Amsterdam, which lacked data about the condition of their city. The CoE AAI then brought together De Fietskoerier Amsterdam, a company that delivers goods with cargo bikes, and Sonarski, a company that developed a LiDAR technology that can scan environments and assets in 3D. These companies then integrated the LiDAR technology into the cargo bikes. They then provided the data to the city of Amsterdam in a very timely and energy-efficient manner to solve their data problem.



What does the CoE AAI want to achieve?

Wissink is "excited about AI and confident that it can contribute to solving some problems we are currently facing if it is used responsibly". He is, therefore, happy that the AUAS aims to achieve its slogan, 'Creating Tomorrows', through digitalisation, sustainability, and diversity. The CoE AAI contributes to the first two through the latter by "ensuring that every student has at least basic knowledge of AI and can use it in their working field in responsible ways". Wissink adds that "the European network is essential for knowledge transfer as we are all working in the European context; we face similar problems and need to learn from each other".

What is the specific role of the UAS within the innovation ecosystem?

AUAS does not invent new technologies but enables its partners to use them. In this sense, the training cycles are also short enough to guarantee that many talents can be trained and integrated into the innovation system. Wissink adds that this leads to "great partnerships with traditional universities as they focus on fundamental research, and we can co-create with partners how to bring this to the ecosystem, which helps to implement the innovation". Generally, the applied research environment is very dynamic since many companies depend on short-term success. However, as the government values the connecting role of AUAS, it can count on public funding and guarantee stability to pursue strategic goals and steer the regional ecosystems.

> *"Great partnerships with traditional universities (can be forged) as they focus on fundamental research, and we (at UAS) can co-create with partners how to bring this to the ecosystem, which helps to implement the innovation."*

How does the CoE AAI connect to other ecosystems across Europe?

At the regional level, AUAS is part of AI Technology for People, a collaboration between governmental, academic, medical and other organisations in Amsterdam to help the city develop and deploy responsible technology in AI. Projects will focus on strengthening the AI ecosystem, and work on AI solutions in three domains: business innovation, citizen support, and health. On the national level, they cooperate through Responsible Applied AI (SPRONG) with the UAS of Rotterdam and Utrecht, and their partners, by bringing their ecosystems together to create a nationwide ecosystem. On the European level, AUAS participates in the

European Digital Innovation Hub Northwest Netherlands to link its ecosystems with others to profit from knowledge transfer and best-practise sharing.

How can further partners get involved?

The various applied AI ecosystems around CoE AAI are built from the inside out and are now reaching the European level. This step includes all European regions equally and will be the focus for the upcoming years, primarily through consortiums. However, the internal, regional and national ecosystems remain open for any collaboration as well because, as Wissink puts it, "you can never do this alone and always have to co-create with SMEs and HEIs – you cannot change the world alone from behind your laptop".

A portrait of FAIR

Interview with Dr. Timo Kaski, Research Area Director Digitalisation & FAIR project leader, Haaga-Helia UAS

What is FAIR?

The Finnish AI Region (FAIR) is a European Digital Innovation Hub (EDIH) in Southern Finland, aiming to boost digitalisation and the use of AI, especially in SMEs. The consortium consists of Higher Education and Research institutions, industry actors and major regional capital cities. The project started in October 2022 with a period of three years. The city of Helsinki coordinates FAIR, but Timo Kaski, Research Area Director for Digitalisation at Haaga-Helia UAS, explains that "Haaga-Helia receives the biggest portion of the project funding as the UAS is supposed to carry out remarkable parts of FAIR's services". The services FAIR provides consist of three parts: Knowledge increase (training and consultancy), possibilities to test before invest and support in finding suitable investors. All these services are provided by different partners within FAIR. Still, they are all accessible through the city of Helsinki as the primary contact point, which lowers the hurdles for SMEs to participate.

What does FAIR want to achieve?

FAIR wants to become a real one-stop-shop supporting companies to respond to digital challenges and become more competitive. Hence, as Kaski explains, "the consortium agreed to build holistic solutions to the problems of companies through all their competencies". By doing so, not only the general capacity in AI and innovation in general should be increased, but also the involvement of researchers, university staff and students in R&D should be strengthened. These are shared visions by all consortium members that often align with individual strategies. Kaski explains that "Haaga-Helia's participation in FAIR is in line with the general strategy to participate in more and bigger European Programmes". Furthermore,

the practise-oriented character of the EDIHs fits perfectly with the UAS's strengths and enables the UAS to provide practise-oriented education to their students.

What is the specific role of the UAS within the innovation ecosystem?

Kaski explains that "Haaga-Helia was only able to become part of the best Finnish consortium by offering their very strong SME cooperation network and the wide range of expertise through its teachers and students". The inclusion of SMEs in the project was essential at the beginning as there is a vast potential for AI, but these companies often do not have the knowledge and resources to leave the daily routine and focus on the longer perspective. Hence, the consortium needed a partner capable of serving SMEs, which is a challenge as all SMEs are different, need a very customised approach and expect a practical attitude. Besides this, new technology development and cooperation with large companies are also essential for FAIR's success. The universities in the consortium cover these components, leading to a situation where, as Kaski describes, "the right organisations are in the right roles". Also, within FAIR's daily work, Haaga-Helia has a unique role focusing on knowledge and service with its students, enabling them to gather practise-oriented skills.

> *Haaga-Helia was only able to become part of the best Finnish consortium by offering their very strong SME cooperation network and the wide range of expertise through its teachers and students.*

How does FAIR connect to other ecosystems across Europe?

Since FAIR just started in October 2022, many cooperations still need to be implemented but are currently being planned. However, already in the conception phase, there was a close exchange with the other EDIHs in Finland as the goal is to link all the different national ecosystems together. However, Kaski emphasises that FAIR will not limit itself to national cooperations but is also aiming to establish multinational networks. He specifies that they "had already intense exchange about a potential link between our innovation ecosystem and the one from the Technical University of Košice (TUKE) in Slovenia as we are both members of the European university alliance Ulysseus and have a common understanding of innovation ecosystems".

How can further partners get involved?

FAIR is still a very young EDIH and has a long journey ahead with many possibilities for further collaborations. Especially in the field of AI, linking different approaches and concepts is a great benefit and, therefore, also promoted by FAIR. Broad engagement is the natural consequence of this openness or, as Kaski puts it, "while we first need to get the project started, further cooperations are certainly in our future plans".

A portrait of the BFH Energy Storage Research Centre

Interview with Priscilla Caliandro, Managing Co-director of the Energy Storage Research Centre at the Bern University of Applied Sciences (BFH)

What is the BFH Energy Storage Research Centre?

The Energy Storage Research Centre of the Bern University of Applied Sciences is the driving force of the Swiss battery technology ecosystem. Following its key role in the Swiss Competence Centre for Energy Research focused on Mobility, the Centre now leads the Swiss Flagship research programme developing a Circular Economy Model for Automotive Lithium Batteries (CircuBAT). They coordinate six leading academic partners and 24 other industry and public sector actors. They also lead the Swiss national platform for industry and research actors of the sector, iBAT, facilitating networking and research support for 64 partners. The Centre's role as ecosystem orchestrator comes on top of its core research activities and its offer of technology infrastructures for testing battery technologies and optimising them for use-cases. In addition to the Swiss federal funding, EU funding and industry involvement, the Centre benefits from a public private partnership with the Switzerland Innovation Park Biel/Bienne. The Canton of Bern partially funded the Innovation Park, which contributed to new capacities for testing and optimising modern storage technologies and is a testament to the region's commitment to leadership in the circular economy, and design for recycling.

What does the Centre want to achieve?

The objective of the current CircuBat Flagship project, whose CHF 7.5 million budget is financed in equal parts by Innosuisse and industry partners, is, according to Caliandro, "to reduce the ecological footprint of Lithium-Ion batteries while keeping an eye on cost-effectiveness. The focus is on optimizing longevity, second-life options and recycling". With the testing infrastructure and research expertise of the Centre, companies can get help with electrical and mechanical battery system design. They also get support on the risk analysis of the entire system, and the deployment of the storage systems into a complete system, like specific mobility solutions. The further complex task of making battery elements

reusable requires solutions for the de-manufacturing of battery packs and planning of digital monitoring solutions. The broad and interdisciplinary spectrum of expertise to meet these needs calls for coordination among many actors. The consortium spans research actors such as EMPA, a leading research centre in materials sciences, EPFL who contribute their knowledge on optimal control of battery systems for second-life options, and the University of St. Gallen who assess the feasibility of various business models.

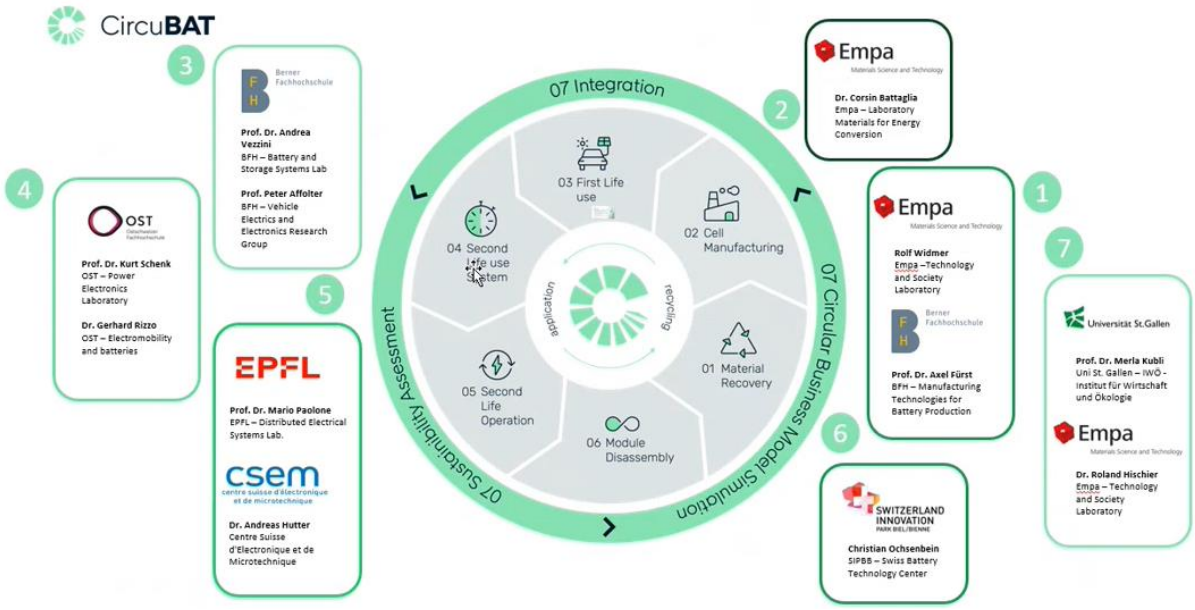
> *The Centre has developed a very good relationship with industry actors over many years of collaborating bilaterally (…) Only BFH could put this broad consortium together because it has experience and this strong industry network.*

What is the specific role of the UAS within the innovation ecosystem?

BFH is the central platform of this collaboration, bringing together industry actors of the battery value chain and the research teams. As Caliandro emphasises, "The Centre has developed a very good relationship with industry actors over many years of collaborating bilaterally on optimizing battery technology for specific use-cases. Only BFH could put this broad consortium together because it has experience and this strong industry network". It is now one of the biggest centres offering such services, in particular for Lithium-ion batteries.

How does the Centre connect to other ecosystems across Europe?

Thanks to their expertise, BFH is already well-connected across Europe. They are currently a partner in the project GENESIS, funded by the EU Commission under the Clean Sky 2 Joint Undertaking, alongside the Technical University of Denmark, Delft University of Technology, and industry leaders in recycling such as Accurec. The goal is to gauge the environmental sustainability of electric aircraft systems, and develop a roadmap to support the green transition in aviation. According to Caliandro, "We regularly attend match-making events to find new collaborations, and we have good connections to European companies". The Centre also develops knowledge sharing through research exchanges. A visiting professor from Poland, with expertise in trolleybus mobility, is working at the Centre in order to then take back the understanding of battery modelling as a complement to his deep knowledge of trolleybus applications.



How can further partners get involved?

While they are always on the lookout for new partnerships, their CircuBat consortium currently has an eye on the EU's push to develop digital passport products for the circular economy. According to Caliandro, "the goal is to push in this direction, and use our expertise in developing data for battery passports prolonging the life of batteries". More broadly, she adds "we are open to every collaboration where there is a complementarity of competencies. We are getting more and more connections to European companies. We have a testing infrastructure that we want to exploit fully: we have an offer for companies to use it, and in return these collaborations give us a better sense of what is on the market, what is selling and how batteries are evolving." This deep and mutual transfer of knowledge with industry and research organizations is the key to BFH's excellence as a platform for applied research.

A portrait of the FHNW School of Life Sciences

Interview with Prof. Dr. Falko Schlottig, Director of the FHNW School of Life Sciences at the University of Applied Sciences and Arts Northwestern Switzerland (FHNW)

What is the School of Life Sciences at FHNW?

The FHNW is a leading education and research institution with strong links to the surrounding region. The Basel area is a rich ecosystem particularly for all aspects of the life sciences sector. In addition to a strong investor community and over 70 research and development laboratories, there are 800 life sciences companies in the region. Their activities span from data science, the traditional chemical industry, medical informatics, and environmental life sciences, to medtech, as well as typical pharma companies doing drug discovery. According to Prof. Dr. Schlottig, "We try to mirror that diversity at the FHNW School of Life Sciences. It is a privilege to work in this ecosystem. The School is fortunate to be involved in the strategy of the region, and to cooperate with leading companies and with universities. The industry is omnipresent in the region, you cross industry peers everywhere, it is diverse in terms of full spectrum of life science activities and the region is quite successful. In terms of patent density proportional to its population the region is second worldwide, it is first worldwide in terms of productivity by working hour, it is third in Europe in terms of the dynamism of workplaces, moving from old ones to new ones".

> *We will see over the next 5-7 years that the mid-sized companies will no longer be willing to send their staff to London or New York for technology-based training. They need an institution that is nearby to help them meet the need to stay on the leading technological edge.*

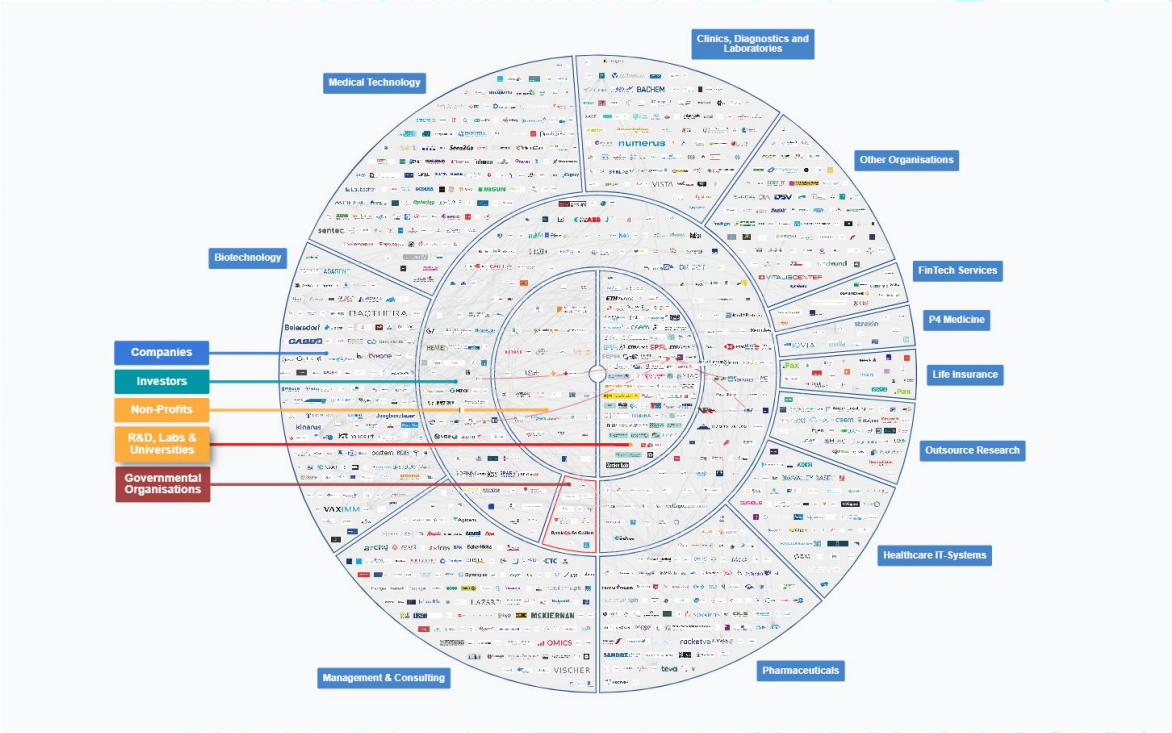
What does the FHNW School of Life Sciences want to achieve?

The FHNW School of Life Sciences has two main missions and a third that is in the developing stages. Prof. Dr. Schlottig explains these as follows, "Our first role is to educate students, so that the industry has the right people, with the right educational 'backpack' that they need for the future. For instance, a chemist in today's industry needs to have an understanding of data science, the sustainability issues surrounding what he is doing, and social aspects such as how to lead a team. We try to integrate the relevant spectrum of skills in all the curricula at Masters and Bachelors level. The second role concerns research,

applied research. There is an expectation, mainly from mid-sized companies that we have the right people with the right expertise at the FHNW School of Life Sciences, with the right equipment so that we can give them a hand in going as fast as possible in their project development plans." The last of the three roles, and Prof. Dr. Schlottig mentions that it remains a work in progress, is continuous education. The School's assumption is that "we will see over the next 5-7 years that the mid-sized companies will no longer be willing to send their staff to London or New York for technology-based training. They need an institution that is nearby to help them meet the need stay on the leading technological edge. The world is becoming faster and faster."

What is the specific role of the FHNW School of Life Sciences within the regional innovation ecosystem?

The FHNW School of Life Sciences collaborates with many actors in the ecosystem. In collaborations with industry, Prof. Dr. Schlottig explains, "It is not that the companies come and tell us what to do, we are not just a research resource. It is really a discussion, they come with a problem and ask us to solve it, and we develop a technology together. It involves a different mindset than just a service research." They also have a clear complementarity with the more fundamental science focus of the large traditional universities, the University of Basel and ETH Zurich among them: "We have a good cooperation, depending on the topic and issues. If you are talking about basic science or applied science, each is specialized: the universities do their traditional basic drug discovery, and we work on specific applications. However, in the field in between basic and applied research, and if the topic is technology, then cooperation is needed. In some cases it is quite successful."



For more information on the Basel Area Life Sciences Ecosystem, click here

How does the FHNW School of Life Sciences connect to other ecosystems across Europe?

The collaboration with other regional and national actors is very strong. Internationally it varies depending on the topic. There is a strong European cooperation in environmental microbiology, in particular on wastewater treatment. There is good cooperation spread throughout Europe – from Bologna to Berlin, from Prague to Aachen and Linköping. On these issues we connect with the whole ecosystem of the industry working on this topic. As. Prof. Dr. Schlottig highlights, the School has a total of 50-70 contracts for internationalization of their research and education programmes. With companies there are a couple of projects but, as he also underlines, "we are not really visible on the European landscape. UAS are usually locally organized organizations, so that is something that we are working on. A further issue are the Swiss-EU relations. We are still allowed to participate in Horizon Europe projects. But we cannot take the lead, which is a loss for our researchers."

What are the FHNW School of Life Sciences' perspectives for future collaborations in Europe?

Prof. Dr. Schlottig hopes for the FHNW School of Life Sciences to become more successful in the EU programmes, "We look to where we can contribute from our research excellence and also our infrastructure. We would be pleased to become part of the quantum computing programme of the EU. We were one of the first schools to create a chair for quantum computing for life sciences, together with our industrial cluster. And we would like to be part of that, but it is impossible. So we have different avenues, such as Bologna, and the Boston area." A more grounded example he offers concerns the environmental impact of nanoparticles. In general, he believes, "we have to look for specific programmes where we can contribute our technology infrastructure, which is really outstanding in Europe, and the excellent track record of our professors, most of whom have been in industry before. So they offer a different expertise than peers at more classical universities with a pure academic research background."

A portrait of Research Burgenland @ Green Energy Lab

Interview with DI Marcus Keding, CEO, Research Burgenland

What is Research Burgenland?

Research Burgenland (RB) is the research subsidiary of the University of Applied Sciences Burgenland (UASB), aiming to improve the innovation capacity of the rural Burgenland region in Austria. It consists of three research centres: the Centre for Building Technology, the Centre for Smart Computing Continuum and the Centre for Energy and Environmental Technology. Marcus Keding, Managing Director of RB, specifies that in the field of energy,

"one of our main priorities is the identification of flexibility and efficiency potentials in existing energy systems as these could be used along the entire energy value chain and across all energy sources". He further explains that "RB is also a member of the Green Energy Lab, a contact point for all companies and institutions that contribute to the energy transition through innovative ideas". In the network of more than 250 partners, the funding member RB is relatively small but still a leading partner as it can substantially contribute through its network and expertise.

What does Research Burgenland want to achieve?

RB wants to contribute to a shift of mindset regarding climate change in rural regions and ensure that these regions are not left behind in innovation capacity. For Keding, it is evident that everyone needs to work together to achieve this goal. Hence, "remaining a partner with whom industry and other SMEs want to collaborate is one of the top priorities". Through the Green Energy Lab, they want to showcase the innovative solutions from their region and demonstrate how a sustainable energy system works and how a cross-regional innovation ecosystem can boost the transition through the exchange of ideas, the development of new technologies or the testing of innovative business models.

What is the specific role of the UAS within the innovation ecosystem?

For Keding, one of the main contributions of UAS is that "they are the link that connects research and the business, which brings innovation into the market". For rural areas, another great advantage is that "UAS have steady collaborations with the regional partners, which has a positive long-term impact on innovation ecosystems leading to more economic activity and job opportunities". In the same field, UAS play a crucial role in preventing labour shortages, as the combination of education, research and entrepreneurship is deeply rooted in the culture leading to well-educated and work-experienced alumni that are especially valuable for SMEs as they can adapt to different work environments and tasks. In the end, for Keding, the rather small size of UASB is an advantage since "the ways between different institutes are short, which allows to combine interdisciplinary approaches and provide interdisciplinary solutions to the partners".

> *UAS have steady collaborations with the regional partners, which has a positive long-term impact on innovation ecosystems leading to more economic activity and job opportunities.*

How does UASB connect to other ecosystems across Europe?

UASB is based in the neighbourhood of Slovakia, Slovenia and Hungary, which leads to natural cross-border cooperation and a multinational innovation ecosystem. Besides this, RB is also deeply embedded in the national innovation system, as its participation in the Austrian Digital Innovation Hub South, a network aiming to accelerate digital transformation, demonstrates. However, Keding emphasises that this is not enough, which is why "with the European Digital Innovation Hub 'Applied-CPS', RB goes one step further to strengthen their network and know-how exchange at the European level". Furthermore, as Keding explains, the UAS generally "highly values the possibility to participate in European programmes like INTERact, which enabled them to install new research infrastructures that led to a flourishing innovation and research system".

How can further partners get involved?

UASB is always open to new collaborations, especially in the field of renewable energy technology, as this has been a research focus for a long time. Keding adds that "the UASB builds long-term relations to deliver long-term output – also on the European level. Through the Green Energy Lab, they are looking for innovative ideas about Climate-neutral supply security and resilience, circular economy in future energy systems, green heat and cold and social acceptance of climate protection technologies and measures. Any ideas are welcome, and everyone is invited to build on their ecosystem and experience in implementation.

UAS4EUROPE – Who we are

UAS4EUROPE aims to strengthen the voice of universities of applied sciences (UAS) in Europe in the field of applied research and innovation. It is both 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.

UAS4EUROPE represents over 2.000.000 students and 60.000 research staff in more than 450 UAS from 24 European countries.