

The landscape of sustainable collaboration in Germany



A future-first approach

Within Germany's higher education space, sustainable research is being incentivised to deliver the greatest impact to a broad spectrum of stakeholders

The higher education space has always been future-looking. Part of any university's remit is to lay the foundations for the creation of a better world by fostering the discovery of new solutions and ideas that will benefit all of humanity. The diesel engine, the electron microscope and even the field of psychology itself can all trace their roots to German universities – inventions that have had a transformative impact across the globe.

This white paper will explore research into sustainable solutions at German universities, looking at how sustainability is currently being prioritised in the country's higher education space, the importance of collaboration between universities and businesses and the future challenges and opportunities set to emerge as a result. Throughout, we'll source opinions from stakeholders from across both the academic and corporate spheres.

Today, the output of many universities is geared specifically toward the topic of sustainable research, producing new ideas for the betterment of the present and the future. "Everything can be traced back to the Brundtland Report in 1987," says Francesca Biagini, vice-president for international affairs and diversity at the Ludwig Maximilian University of Munich (LMU). "The report introduced the concept of sustainable development, defining it as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Within universities, we can play a fundamental role in supporting this ethos."

To fulfil this role, several frameworks have been put in place by the German government and higher education institutions to support sustainable development. These often manifest via initiatives or funding programmes at either the federal or state level.

"We view all the available support frameworks through an impact lens," says Jelena Spanjol, head of the Institute for Innovation Management at LMU. "At the Bavarian level, there has been a call for impact-orientated entrepreneurship, teaching and training by the State Ministry of Sciences, Research and the Arts. The associated grant, and others like it, really incentivises universities to transfer their knowledge in support of new start-ups and prioritise a more holistic view of value-creation."

This holistic view takes into account various stakeholder opinions, with the public sector playing a key role. "The sustainable policies pursued by Germany's government provide a combination of triggering impulses for the higher education sector in the country," says Stephan Ramesohl, co-head of the Digital Transformation Research Unit at the Wuppertal Institute for Climate, Environment and Energy. "On the one hand, there is the research policy itself, which provides funding for a broad range of programmes. There is also another pillar of applied research that is supported by government ministries, whether



it's the ministry for transportation, economics, housing or any other agency."

These government bodies may prove fundamental in ensuring that research leads to real-world impact that serves the economic needs of particular sectors and even a nation's entire economic output. For that to be the case, sustainable research cannot be evaluated purely based on its inclusion in academic journals or the number of awards it garners, but rather the tangible results it leads to.

"Today, there is a lot of consideration of how university research into sustainability topics can support the transformation of economic actors in moving towards greener business models," Spanjol says. "This is, of course, a very dynamic field, so the United Nations' Sustainable Development Goals provide a really nice framework for providing different disciplinary perspectives and facilitating closer conversation and collaboration within which the sustainability agenda can flourish. In this sense, they help with the prioritisation of university research projects."

Given the breadth of fields that sustainability covers, any initiative is more likely to be successful if it is supported by external actors, with the German government facilitating cooperation between academia and industry. Funding is, of course, part of this, with Biagini explaining that government strategies, both at the federal and regional levels, have "a huge impact on how funding is distributed and, subsequently, which research areas universities focus on".

In addition to the guidance coming from the public sector, German universities are also increasingly working with private industry. This is evident through initiatives like LMU's

impACTup! programme, which aims to develop sustainable business ideas, and the university's LabForest project, which has received €2.78 million (£2.34 million) of investment and aims to generate practical applications in German forestry and timber industries over the next five years.

"Money is always a limitation, of course, within the landscape of sustainable research in the country – as it is everywhere," says Beatrice Schulz, head of department technologies and markets at BVES, the German Energy Storage Systems Association. "However, policies like Germany's climate goals are guiding what research projects are being undertaken at universities, particularly with regard to industry collaboration. This ensures research takes place within a holistic framework. Universities, research institutions, government and industry are all consulted."

As is made clear in Huawei's 2022 Sustainability Report, collaboration between industry, government and academia can have deep roots. For example, Huawei's Seeds for the Future programme was launched in 2008 to help universities foster the

next generation of digital talent, working with both the public and private sectors. To date, the programme has benefited more than 2.43 million people from over 150 countries.

"Society must understand that our world is at its limits," says Ingobert Veith, vice-president and head of public affairs and communications at Huawei. "It's clear that countries like Germany cannot continue exploiting resources in the same way they have previously. The question is, how can sustainability be embraced further? The answer lies in finding a balance between healthy economic development and reducing emission levels. For that to happen, universities in Germany and around the world will need to collaborate closely on cutting-edge research with the right partners. Governments can steer and support this research, but universities must ultimately advance it."

The existing landscape for sustainable research in German higher education holds much promise, owing to input from academia, industry and the public sector. However, continued progress is essential. Further collaboration could unlock it.

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Branded content editor
Ashton Wenborn

Designer
Joe Wilkes

Images
iStock

Contributor
Barclay Ballard

Sponsorship and advertising opportunities
sponsorship@timeshighereducation.com

Times Higher Education
26 Red Lion Square
London
WC1R 4HQ



Collaborating across borders and disciplines

Sustainability is too important for university research to pursue independently. Cooperation with academics and businesses around the world will be key

To make the kind of impact that many universities are striving for, an internalised focus on enrolment, teaching and curricula alone is not enough. To further sustainability in a tangible way, the higher education space must also forge strong connections with industry to translate research into viable products and services.

"There is a lot of project-based cooperation between industry and universities in Germany," says Ingobert Veith, vice-president and head of public affairs and communications at Huawei. "We take part in this too and have a large research institute in Munich where we conduct many of our European research and development initiatives. There are various universities involved, all working towards tangible outcomes. At the same time, we need to guard against research initiatives becoming too fragmented. So there needs to be clear goals when industry and universities are working together."

These goals should incorporate the different perspectives that higher education and industry bring to sustainable development initiatives. Rather than representing a challenge, these different views can create the right environment for a fruitful exchange of ideas.

"When looking at the energy transition, there are always different types of motivation," says Stephan Ramesohl, co-head of the Digital Transformation Research Unit at the Wuppertal Institute for Climate Environment Energy. "Sometimes the research is driven by a particular issue, for example, that may not initially be that interesting to the corporate world. Often, we then see growing engagement and interest from these industries in being part of any potential solution. This may be the result of shifting consumer preferences, market developments or simply the profit motive. But whatever the reason, the alignment of the differing perspectives that come from academia and industry respectively can result in sustainable development initiatives creating greater impact."

Beatrice Schulz, head of department technologies and markets at BVES, the German Energy Storage Association, agrees that an exchange of ideas between higher education and business can lead to research initiatives with greater real-world results. "University research can play a leading role when sustainable initiatives are not able to deliver profitability yet," she says. "They are great for developing core technologies up to a point before commercialisation can be achieved."

It is not difficult to find examples of the successful intersection of academia and business when developing



sustainable solutions. They include the projects being pursued by Stifterverband für die Deutsche Wissenschaft, a non-profit focusing on education, science and innovation through various roles, including promoting greater collaboration between science, policymakers, business and society. Working alongside the German Federal Environmental Foundation, Stifterverband is serving as an interface between companies and universities as part of its Transformative Skills for Sustainability project.

"Stifterverband is a relatively unique organisation," says Jelena Spanjol, head of the Institute for Innovation Management at the Ludwig Maximilian University of Munich

(LMU). "It's not just about fostering interaction or dialogue between sectors but also promoting actual work. You can see this through the offers of project funding for the universities it works with. And, of course, sustainability is at the core of this."

Further instances of sustainable collaboration between higher education and business in Germany can be seen in the 100 spin-offs that have emerged from research at LMU. Many of these are based in the healthcare sector and focus on social sustainability, including the likes of Neurevo and EpiQMax.

Another example of an LMU spin-off that underlines the importance of collaboration between universities and industry

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stretching beyond national borders is Eisbach Bio. This provider of precision oncology drugs recently announced a strategic research collaboration with the University of Texas MD Anderson Cancer Centre. It's evidence of higher education research in one country leading to the creation of a start-up that goes on to partner with a university in another.

"At the academic level, we remain convinced of the importance of international collaboration," says Francesca Biagini, vice-president for international affairs and diversity at LMU. "This is fundamental for addressing the complexity of today's societal and environmental issues. Just to combat global warming, for example, we need everyone on board. The same is true for treating diseases like cancer. Germany will not be able to solve these issues alone. Nor even will Europe. Global expertise is required to maximise resource usage."

However, this collaboration, whether it takes place domestically or on a global stage, is likely to require guidance from the public sector. In Germany, this guidance comes from both federal and regional policies, like the Cluster Initiative Bavaria, which has led to various projects involving research institutes and businesses generating more than €282 million (£238 million) of federal financial assistance and more than €53 million (£4 million) of funding from the European Union.

If the viewpoints of different stakeholders are vital to engendering sustainable development, then allowing governments to steer these viewpoints into constructive dialogues and projects is equally important. This direction doesn't need to be didactic either. It can form part of a two-way collaborative process, with Biagini stating that "many professors at LMU are also advising governments on sustainability".

"Time is not on our side," Veith admits. "We need to promote transformative solutions that take from both academia and industry. The former boasts the freedom and creativity we need, while the latter retains sight of the economic dimension. Both are important and governments can help guide them in the right areas."

As Veith states, today's sustainability challenges only appear to be getting more pronounced. Successfully resolving them requires input from all relevant parties. Just look at the seemingly entrenched problem of climate change. Despite the Paris Agreement being adopted in 2015, the latest reports state that national initiatives remain insufficient for achieving global goals.

"An international approach is crucial to furthering sustainable research and supporting links between universities and businesses," Schulz says. "Different countries have different priorities and can learn from each other. The same is true of business and higher education. You can see this in schemes like the International Energy Agency's Technology Collaboration Programme, which involves over 6,000 experts worldwide representing nearly 300 public and private organisations across 55 countries."

For sustainability, global trends matter. Understanding interdependencies relies on research collaboration, viewing challenges through a broad lens and integrating solutions for the greatest possible impact. As Ramesohl notes: "Access to the relevant know-how that could potentially solve a particular sustainability challenge may not be available domestically."

Sustainable initiatives for long-term success

In meeting ambitious sustainability goals, the German higher education sector is set to be supported by both the private and public sectors



Although the higher education sector's ongoing focus on sustainable research is producing results, challenges remain entrenched. Decades of short-term thinking mean that considering the needs of future generations has not always been the focus for projects in academia and industry.

"When universities are looking to collaborate with industry, there is always a cultural challenge," says Francesca Biagini, vice-president for international affairs and diversity at the Ludwig Maximilian University of Munich (LMU). "This concerns differences in language and the spectrum of projects being pursued. And of course, while universities may face publication pressure, they do not face the pressures around profitability that industry players have to cope with."

Just as the nature of the sustainability challenge is a complex one, the pressures facing the higher education space are similarly multi-faceted. As important as sustainability is, universities have obligations to financial backers, governments and students. Meeting all of these needs simultaneously requires institutions to carry out a delicate balancing act.

"Even though the sustainability challenge is one of most pressing in mankind's history, we are entering a phase where questions of this nature may be parked due to other priorities," says Stephan Ramesohl, co-head of the Digital Transformation Research Unit at the Wuppertal Institute for Climate Environment Energy. "Keeping pace with the rate of digital innovation will also not be easy."

"Another challenge that we have to overcome is simply that we need to be faster," says Beatrice Schulz, head of department technologies and markets at BVES, the German Energy Storage Association. "Currently, if researchers apply for funding for a particular solution, it can take months or years before it is approved. From the idea stage to actual product development, a lot of time may pass. As the field of sustainability is moving extremely quickly, this delay could mean solutions are more likely to end up being irrelevant or ineffective."

However, the good news is that the higher education space does not need to act on its own to meet these challenges. Outside support is available, including from supranational organisations like the United Nations (UN). The UN's Sustainable Development Goals (SDGs), for example, are hugely helpful in providing a framework that guides sustainable research within universities and encourages a global outlook, one that is not beholden to domestic pressures.

"Perhaps the biggest impact that the SDGs can have in terms of sustainable research is with regard to guiding future projects and initiatives," says Ingoert Veith, vice-president and head of public affairs and communications at Huawei. "The SDGs formalise long-term goals so academia, industry and society understand what must be done. Plus, the SDGs are comprehensive. They aren't limited to, say, the environment. That doesn't mean there aren't challenges. Universities still need to monitor their progress towards meeting the SDGs."

"The real power of the SDGs lies in the way they point towards concrete indicators of sustainability, not just broad topics or grand challenges," says Jelena Spanjol, head of the Institute for Innovation Management at LMU. "This defines the direction of research and investment for higher education, business or government policy. These indicators break progress down in a very tangible and measurable way."

Some of these indicators are more directly related to the higher education space, such as ensuring universal access to affordable and high-quality technical, vocational and tertiary education. But there is a wide range of areas where universities can have a positive impact. These include the improvement of labour rights within an institution, reducing emissions and ensuring resource efficiency.

Although they help break down the sustainability challenge facing the planet, meeting the UN's SDGs still represents a

sizable task. Fortunately, the important role that the higher education sector in Germany, and globally, is set to play within the sustainability movement seems to be well understood by a variety of parties. "At LMU, for instance, we can access many types of funds to support our research into sustainability," Biagini says. "This includes financing at the Bavarian, German and European level. In the last few years, for example, we have benefitted from the Hightech Agenda Bayern, which has granted us billions of euros for several new professorships at the university. This has been followed by over €100 million (£84 million) from Hightech Transfer Bayern to foster research and knowledge transfer."

As Biagini says, it's not just higher education or private industry that have roles to play in terms of sustainable research. Government policy is critical too – and, despite the available funding mechanisms, more could be done at a policy level. This is especially true in terms of fostering industry partnerships across German higher education. "The interaction between political policy and academia needs to be improved," Veith says. "We have many discussions in Germany where emotions seem to lead rather than reason, as with nuclear policy in the country. The full spectrum of stakeholder opinions isn't necessarily considered."

This underlines the fact that sustainability is a challenge for all of us. The higher education sector may provide one of our greatest tools for delivering positive outcomes for future generations – economically, socially and environmentally – but it is not the only one. "We need to get faster at making our sustainable initiatives a reality," Schulz says. "Engaging

"The real power of the SDGs lies in the way they point towards concrete indicators of sustainability"

in more dialogue regarding potential solutions is one way of achieving this. This includes fostering communication between universities, businesses and governments. They all have a role to play."

The good news is that the direction of travel appears clear. The need to promote sustainability is almost universally agreed upon. Working hand in hand with industry, there is justified optimism that universities can help formulate solutions to some of the biggest issues threatening the planet and its people.

"I don't think more money is necessarily the answer," Ramesohl explains. "I think we just need a clear understanding and commitment, a commonly accepted narrative that the next 10 to 20 years will represent a period of transformation. We are all attempting to build a brighter future and there may be bumps on the road, but there is no question it is the right path. It's all about cooperation – between academia, industry and government. The flow of private capital into this area is inevitable and the public sector is keen to direct it to the right areas. Financial backing will, in turn, foster further sustainable research from universities, creating a positive feedback loop built on collaboration and mutual understanding regarding the importance of sustainability."

The German higher education space remains poised to seize the opportunities held within the sustainability movement. And it is already being backed with substantial levels of support to do so.

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