Verband der
Chemischen Industrie e.V.
Wir gestalten Zukunft.

VCI-INNOVATIONAGENDA - **DISCUSSION PAPER**

Unleashing innovation - securing a sustainable, successful future

Innovations enable value creation, prosperity and sustainable development

Innovations are the basis for progress and ensure competitive advantages and resilience. They set new trends and create new markets. Innovations provide the necessary high-performance and competitive products and processes needed to meet challenges such as the transition to climate neutrality, a more circular economy and sustainability. They also enable us to meet customer expectations for continuous improvements and customised solutions. They enable cost reductions in production and make the location attractive. Overall, this promotes investment in Germany and Europe as a centre of research and industry. Above all, however, they offer Germany, which is poor in raw materials, the opportunity to be successful on the global markets with high-quality products. They therefore form the basis for our economic strength. And finally, they attract talent - bright minds with creative ideas making innovations possible in the first place.

The chemical industry - the central partner

Chemistry plays a unique role in the economy. With its products and processes, it stands at the beginning of almost all central value chains in many industries worldwide; for example, in battery and chip production, as a material supplier for automotive and electronic components, in the manufacture of pharmaceuticals and medical products, in the consumer goods industry or in construction. It is therefore an initiator and pioneer for innovations in these and many other sectors. The chemical industry possesses in-depth scientific knowledge, methodological skills, interdisciplinary expertise and the know-how to transform innovations into market-ready products. Typically, a corresponding pilot plant and, ideally, the first production plant are set up at a research location as development progresses. This facility can, in turn, serve as a focal point for further investments and thus value creation—contributing both to the surrounding region and the entire economy.

Challenges of a changing world

The chemical industry is under great pressure to act: it must simultaneously manage the transformation to climate neutrality and sustainability, establish a circular economy, digitalise itself and further increase the safety and sustainability of its products. It must also respond to the demographic gap in STEM specialists. Adapting to these challenges requires an enormous effort. Companies must go far beyond the normal level of investment in research and development and in new products, systems and processes, reorganise supply chains, implement new business models and at the same time compete internationally.
All of this must be viewed against the backdrop that the industry is currently struggling with higher production costs due to rising energy and raw material prices and high labour costs, taxes and levies. In addition, the large number of regulations and bureaucratic requirements are making research, development and production in the chemical industry in Germany and Europe increasingly unattractive. As a result, the necessary investments in innovation are not being made here in Germany, and in the long term, production is being relocated abroad to non-EU countries - and this is happening during a time of intensifying industrial policy competition and growing geopolitical and

Innovative strength - the foundation of competitiveness

Investments in innovation are important to achieve the industry's climate and sustainability goals and deliver innovations for other industries as well as society - be it for a successful transformation, resilience

and a functioning healthcare industry. From a national perspective, innovations are the cornerstone of the German business model to achieve success in global markets with high-quality products. Conversely, without economic success and the associated earning power, it is not possible to invest in research and development and produce the necessary innovations. Investment in a location - whether in machinery, plant or research and development - depends on the quality of the location. However, it is in precisely these mentioned aspects where Germany has experienced a decline in recent years, as evidenced by the numerous general location rankings. Most recently, a study by the Swiss university IMD[1] showed that Germany dropped two places to 24th place, falling behind in almost all sub-indicators: economic performance, government and business efficiency and infrastructure.

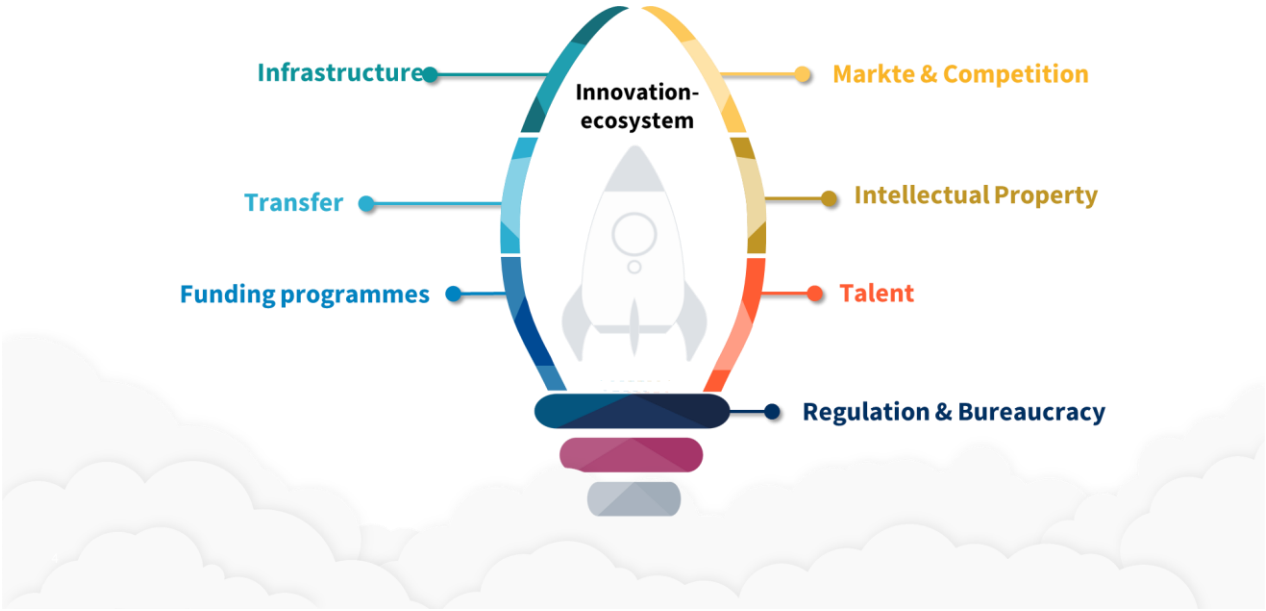
So how is Germany doing as a centre of innovation? Rankings aggregating multiple indicators of innovation capability offer valuable insights. Overall, Germany is still a good location for innovation: In the latest BDI Innovation Indicator Study[2] , Germany is certified as having an overall stable innovation system in all sub-sectors. In today's rapidly changing business environment, stability is no longer enough. To remain competitive, companies must embrace rapid, high-quality innovation. Other countries are investing heavily in strategic innovation, while traditional structures in Germany sometimes hinder rather than help. Compared to other countries, the location slipped from 10th to 12th place. Germany is not dynamic enough as a centre of innovation. A notable challenge lies in the transfer of knowledge into innovation. This is attributed to the unfavourable skilled labour situation, low venture capital investments and underfunded funding programmes in key technologies. Furthermore, Germany's innovation policy is not very strategic in its thinking and even less strategic in its actions. It is no longer enough to rely on existing advantages; innovations must be strengthened in concrete terms.

In practical terms, what does it mean to „strengthen innovation“?

Germany has good fundamental research in chemistry, companies with strong research capabilities and a broad, functioning industrial network. However, this alone is not enough to keep up with the innovation competition. Achieving innovation and competitiveness requires a solid and supportive framework. The political agenda must put innovation back in the foreground. Technological openness and neutrality as well as freedom of research must be guiding principles, also to promote the willingness to innovate and acceptance of new technologies in society. To advance innovative products and technologies to market maturity, we require competitive conditions in key areas such as financing, tax policies, market design, skilled labour, approval procedures, and infrastructure. A high-performing and globally competitive innovation ecosystem must incorporate the following ingredients:

[1] https://www.imd.org/entity-profile/germany-wcr/

[2] Innovation Indicator 2024, BDI/Roland Berger/Fraunhofer ISI/ZEW,



1) MAKE REGULATION AND BUREAUCRACY MORE INNOVATIONFRIENDLY

Regulation should be used sparingly, be coherent, and focused on promoting international competitiveness. It should aim to incentivize growth and innovation, not to impose unnecessary constraints. What needs to be done?

- The German government and the EU Commission must follow up on their announcements to consider the impact on innovation and competitiveness earlier in the EU legislative process, especially in view of the further implementation of the Green Deal. This requires, among other things, the application of the "Better Regulation Toolbox #22" at EU and national level. Open spaces should be created through regulatory sandboxes. On national level the *Reallaboregesetz* should facilitate technology-specific experimentation clauses.
- Regulators must rapidly recognize and promote research and demonstration facilities, carbon management measures (CCU, CCS, and CCUBio), chemical and biotechnological recycling processes, gene editing, and precision farming methods.
- New processes and technologies must be developed and implemented with economic viability in mind, including in energy supply and the shift to climate-neutral solutions. Industry projects are assessed within the constraints of the current regulatory framework. If the regulatory framework imposes excessive costs, lacks stability due to constant changes, or disregards the requirements of innovative processes and technologies, businesses will be cautious about investing in research or implementation in Germany.
- Through its initiative for the strategic advancement of biotechnology and bioproduction, the EU Commission is delivering crucial incentives to enhance the EU's international competitiveness, future resilience, climate-friendly focus, and crisis preparedness in the years ahead. A key goal is to establish harmonized regulations tailored to the unique characteristics of medical, industrial, agricultural, and forestry biotechnology, addressing the current barriers to innovation in the EU. The Federal Government is requested to advocate for the consistent implementation of this biotech initiative by the EU Commission in the coming years.
- Medical biotechnology plays a pivotal role in advancing healthcare and should be recognized and championed as a strategic investment in a sustainable Europe. By driving life-saving innovations, it strengthens health systems, improves patient outcomes, and ensures resilient, technologically sovereign production capacities across Europe and the EU Member States.

- The German government should work with the new EU Commission to ensure that the EU chemicals policy remains risk-based and does not introduce blanket substance bans. Innovations, especially in materials science, require chemical diversity, availability and safety. Initiatives such as the Safe and Sustainable by Design (SSbD) concept should be implemented in a pragmatic and practicable way. A purely hazard-based approach and the considerable amount of data involved slow down innovation.
- To promote a European data economy, it is essential to pursue a practical implementation of pivotal digital legislation, including the EU Data Act and the EU AI Act. National regulatory initiatives, such as the Research Data Act, must align with this approach. A reform of the provisions governing the use and sharing of data, including data for industrial and scientific purposes, is urgently needed, as many of these provisions are restrictive and cause unnecessary scrutiny. Compulsory data sharing, especially of IP and business-relevant data, should be avoided at all costs.
- The Commission as well as the EU Member States must simplify the bureaucracy involved in applying for funding (national and EU) and in planning, approval and authorisation procedures. The processes and procedures related to both aspects must be shortened and accelerated.
- The approval processes and regulatory requirements for industrial plants at the R&D, small-scale production, modular and pilot plant levels need simplification. Administrative burdens such as documentation and expert assessments should be reduced, with clear, attainable objectives set. Digital systems with strong cybersecurity measures and mechanisms to protect trade secrets must be adopted across all processes. The EU Commission must follow through on its commitment to reduce bureaucracy with determination and consistency, especially in relation to the Industry Emission Directive (IED). The directive should also be subjected to a practical review in the future to avoid potential conflicts of interest.

2) OPEN THE WAY FOR MARKETS, ENABLE COMPETITION

- Markets and competition offer significant incentives for innovation. It should be examined whether and how the indispensable supply-side measures can be complemented by suitable demand-side measures to develop or strengthen the markets for sustainable products without too many disadvantages for the various links in the value chain.
- Technical standards are the key to market access and decisive for the international competitiveness of German industry. Standardisation strengthens resilience towards systemic competitors and is a strategic factor in global competition. China strives to play a leading role in international standardisation and is using its rules to advance its own interests, thereby creating strategic dependencies worldwide. The EU and Germany must strategically expand their engagement in international standardisation to secure their standards and technologies globally.
- Trade agreements and partnerships must facilitate access to new markets and promote the export of chemical products and technologies.
- The EU internal market should be further deepened, e.g. in capital and energy markets, and new fragmentation must be avoided. It offers the necessary scale for new products, especially in competition with the economic superpowers USA and China.
- The European Research Area (ERA) must become a true single market for research and innovation, where industry is recognized as an equal player. The ERA policy agenda should consider the needs of industry and promote a coherent application of relevant legislation in areas such as chemistry, life sciences and AI.

3) DESIGNING FUNDING PROGRAMMES STRATEGICALLY AND WITH PLANNING CERTAINTY

Well-funded research programmes are the basis for paving the way for new technologies. However, they must be implemented through flexible, cross-departmental and predictable funding instruments. In concrete terms, this means

- The technological strategies, funding programmes and tenders should be developed in close dialogue with the stakeholders in terms of content and concrete design.
- The funding instruments and the individual funding programmes should be agile and adaptable to the requirements of the companies and their partners (science and industry) according to the conditions of project funding.
- The national and European funding instruments must be better interlinked and harmonised to map and support the entire innovation chain from investments in laboratories to pilot/demonstration plants and first-of-its-kind production facilities.
- Crucial technologies, including advanced materials, biotechnology, quantum computing, AI, and electrification, which are vital for economic transformation, must be consistently supported. This should be paired with strategic research agendas that address the needs of the chemical industry and its innovation ecosystem. A sustained commitment of no less than ten years in key strategic research areas is essential.
- The European "SME definition" should be extended to further company sizes to include companies from the industrial SME sector (>500 employees) from a research policy perspective.
- The effectiveness of the Important Projects of Common European Interest (IPCEI) should be increased. Above all, the current two-track application procedure must be greatly simplified, governance improved, and the flexibility of the instrument further developed. The planned Joint European Forum (JEF)-IPCEI can contribute here, provided this does not lead to a bureaucratisation of the process.
- Regulatory Sandboxes, Living Labs and Testbeds must be created to realise the scale-up and adapt the regulatory framework.

4) STRENGTHEN COOPERATION AND TRANSFER

National and international cooperation between industry and science and collaboration between value-creation partners must increase. This will strengthen the transfer from research into marketable products. What is needed?

- The establishment and strengthening of innovation centres and clusters by the public sector, in close coordination with stakeholders from industry and science. They should be supported by exchange formats and workshops. Both domestic networking and the European and international dimension should be considered.
- IP licensing platforms, which enable cooperation between companies of all sizes through simple and fair access to intellectual property (IP) rights, must be facilitated and exempted from antitrust restrictions by means of the Block Exemption Regulation.
- The framework conditions for cooperation between companies and public research institutions under state aid law must be simplified and clarified to accelerate innovation cycles.
- In light of geopolitical tensions and increasing global competition, it is crucial to manage the risks associated with international cooperation, such as the potential for uncontrolled knowledge transfer. The principle of "open where possible and close where necessary" must apply. Research security initiatives are necessary to protect EU citizens and ensure economic security. However, the measures derived must result in a further bureaucratic burden.

5) IMPROVE FINANCING OPTIONS

Diversified and targeted financing is necessary to bring innovative products and technologies to market maturity. Above all, it requires

- Maintaining the target of investing 3.5 per cent of the German GDP in research and innovation (R&I), even in the context of limited financial resources. The German government should support the EU Commission in its efforts to ensure that the 10th Framework Programme for Research and Innovation is adequately funded, e.g. in line with the claim of 220 Billion € in the Heitor Report, and to encourage the individual member states to increase their spending on research and development in order to achieve the EU target of 3.0 percent of European GDP for R&I. Government funding in business-science/academia partnerships should be enhanced and secured for long-term stability. Furthermore, research funding should be made seamless from basic research to pilot and demonstration plants. The possibilities of the state aid framework should be utilised proactively and synergies with EU funding should be expanded.
- Promoting dual-use technologies must not come at the expense of civil research funding. A generalized dual-use tagging system for technologies could inhibit progress in research and development. The potential for good or harm lies in the application by the user. Enhancing awareness of this dynamic in all research domains is a valuable step.
- Additional growth capital from venture capital and instruments with a long-term financing horizon is necessary. Given the capital and time-intensive nature of innovations in the chemical industry, this is an essential requirement for success.
- A growth-promoting tax policy that incentivises entrepreneurial activities at the location and attracts investors. To this end, tax deductions and tax incentives for research must be expanded as an instrument in global competition. Planned measures, such as the investment premium for climate protection, should be improved and introduced.

6) ATTRACTING, PROMOTING AND RETAINING TALENT

- To attract, promote and retain talent, various measures must be taken to utilise both national and international potential. STEM education at schools and universities must be improved in terms of quality and quantity. The federal and state governments should invest more in equipment, teacher training and mid-level academic staff. Data skills should be included in the curriculum at an early stage.
- Although the Federal Government's Skilled Immigration Act is an important development, it is vital to further simplify and accelerate administrative procedures, as well as ensure quick recognition of professional qualifications from abroad.

7) UNDERSTANDING THE PROTECTION OF INTELLECTUAL PROPERTY AS AN INTEGRAL PART OF LOCATION AND INNOVATION POLICY

- Protecting intellectual property (IP) is a cornerstone of effective location and innovation policy, driving both competitiveness and sustainable growth. IP rights must cover new innovations in new fields of technology. EU standardised supplementary protection certificates are necessary.
- As the EU moves forward with the legislative process for new genomic technologies (NGTs), the EU must maintain current patent protection standards and refrain from implementing specific regulations for NGTs. The proven Biopatent Directive, which has spurred innovation in medical, industrial, and agricultural biotechnology for more than 20 years, should not be compromised. Implementing special regulations would spark fundamental debates, generate legal uncertainty, and impede innovation across biotechnology sectors. The Federal Government is asked to ensure a consistent EU-regulation that protects inventions and encourages continued progress in biotechnology.

- Increasing geopolitical and competitive pressures require clear legal frameworks and instruments to protect IP that do not enforce an "open to the world" approach to scientific data. The protection of IP for the commercial exploitation of research by European industry should take precedence over open access to project data.

8) IMPROVE INFRASTRUCTURE

- Research and technology infrastructures must be developed/expanded with a view to European added value and harmonised both nationally and within the EU. They must also be coordinated with the stakeholder community. In particular, large-scale research institutions should provide industry with effective, low-threshold access to pilot lines or research factories, with a focus on SMEs and midcaps in the manufacturing industry.
- To drive forward the European circular economy and successfully shape the transition to a non-fossil and low-carbon economy, the potential of the circular economy, carbon management and biotechnology for the development of innovative recycling and production processes must be utilised and politically promoted. This also requires supporting the entire process from research and development to scaling up to industrial levels.
- Without reliable access to renewable energy and raw materials, innovation lacks the necessary economic incentives. For instance, to enable the development of a future CO2 pipeline network, financial instruments like amortization accounts are necessary to offset high upfront costs and prevent them from becoming a barrier.
- High-speed broadband networks and reliable data and data centres are essential for digital transformation and data-driven innovation.
- More competition and opportunities to switch between cloud providers will also help small and medium-sized enterprises to benefit from data ecosystems. Compliance with European values and standards is a basic prerequisite for participation in a European data ecosystem.

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- The VCI is registered with registration no. R000476 in the Lobbying Register for the Representation of Special Interests vis-à-vis the German Bundestag and the Federal Government.

The VCI and its sector associations represent the interests of around 2,300 companies from the chemical-pharmaceutical industry and areas related to chemistry vis-à-vis politicians, public authorities, other industries, science and media. In 2023, the VCI member companies realised sales of ca. 245 billion euros and employed over 560,000 staff.