

# Appointments in the Technological Sciences

Recommendations to Strengthen  
Research and Innovation

acatech (Ed.)



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Academia and industry have always interacted closely with one another in the technological sciences. Academia seeks to expand our current knowledge, and in doing so also provides solutions to practical challenges. For its part, industry formulates questions, raises problems and provides a critical testing ground for many of the solutions devised by academia. Findings from industry also feed into academic research.

This close integration of academic research and industrial practice has made a significant contribution to the strength of Germany's innovation system over the past few decades. The major challenges currently facing society mean that maintaining and building on this strength is now more important than ever. These challenges include the energy transition, demographic change and the associated requirement for higher productivity, and the ongoing digitalisation of our lives and work. Our ability to find innovative and profitable solutions to these challenges will be key to determining whether Germany can remain a successful location for technology and industry in the future.

Cooperation will play an even more critical role than it did in the past. Close collaboration between academia and industry is essential for establishing complete innovation cycles where basic research feeds into practical applications which in turn feed back into research.

The challenges that this poses for the technological sciences are best addressed by a combination of theoretically and practically focused university professors, with the optimal mix of theory and practice varying from one subject to another. The appointment of professors with industry experience has been a feature of the technological sciences in Germany for more than a century. This tried-and-tested approach has helped to strengthen German innovation. However, there are growing signs that it is now under threat.

This acatech POSITION PAPER calls for the continued – and indeed increased – appointment of engineers from industry to

university posts, since the practical focus that they bring to the technological sciences is absolutely key to delivering world-class research. It also strengthens the public profile of universities and the results produced by the German innovation system among both large and small and medium-sized industrial enterprises.

This acatech POSITION PAPER is first and foremost directed at everyone in the technological sciences and allied fields. It calls on them to actively support the appointment of university professors with industry experience and a practical focus. It is also aimed at representatives of universities and industry, and research policymakers. University administrations are the most

## At a glance

- The close integration of academic research and industrial practice has made a significant contribution to the strength of Germany's innovation system over several decades.
- It is important to maintain this strength in view of the major challenges facing society, such as the energy transition and ongoing process of digitalisation.
- This will require a combination of theoretically and practically focused university professors in the technological sciences.
- It is therefore important to ensure the continued – and indeed increased – appointment of engineers from industry to university posts.
- In addition to publications, other criteria such as candidates' previous positions and other achievements and successes should also be taken into account.
- Universities should also simplify appointment procedures, allow professors more time for teaching and carrying out their own research, and utilise the industry contacts of professors with a background in industry.



important actors when it comes to appointments. Research policymakers establish the general conditions for making appointments in the relevant higher education acts, while industry can provide the people it employs with opportunities to gain the qualifications needed for university professorships.

## Recommendations for academia and policymakers

The following recommendations are aimed at the technological sciences in universities. However, they are also relevant – with some minor modifications where appropriate – to non-university research institutions.

### (1) Maintain and increase the appointment of university professors with industry experience

The appointment of university professors with industry experience strengthens the technological sciences and Germany's innovation system. If this tried-and-tested system continues to be weakened, Germany's position as a successful technology location could be jeopardised.

### (2) Consider results as well as publications when appointing people from industry

People working in industry have limited opportunities to produce academic publications. Consequently, criteria other than publications could be used when making appointments, for example the candidate's previous positions (e.g. departmental manager) and concrete results (systems and products that they have built, prototypes, projects, patents, licences, training courses that they have delivered, conference papers given, etc.).

### (3) Give people working in industry more opportunities to publish

There are a number of constraints on publications by people working in industry, for instance the confidentiality requirements with regard to new products and techniques. Nonetheless, publications serve to enhance a company's reputation and strengthen cooperation between academia and industry. The potential of publications from industry should be acknowledged and, if necessary, activated.

### (4) Professors who have spent their entire career in higher education should be the exception

Interaction with industry is of fundamental importance to the technological sciences. Professors with industry experience are in a stronger position to build successful cooperation. However, the tenure track system generally favours the appointment of professors who have spent their entire career in higher education and

is thus less well suited to the technological sciences. Measures along the lines of the shared professorships model are needed to facilitate the transition from industry to universities.

### (5) Simplify appointment procedures

Current moves to simplify and expedite appointment procedures should be systematically developed and evaluated. This is in the interests of both universities and the candidates from industry. Otherwise, there is a danger that the proportion of professors with industry experience will decline purely due to the complexity and duration of appointment procedures.

### (6) Foster a culture that welcomes newly appointed professors from industry

The environment and culture of universities and industry are very different. Universities should help professors appointed from industry to adjust to their new surroundings and communicate their expectations before the appointment procedure begins.

### (7) Allow professors more time for teaching and carrying out their own research

Research and teaching should be the top priorities at universities again. In recent years, rising student numbers have had a detrimental impact on student-teacher ratios in the technological sciences, with a negative knock-on effect for research. Policymakers and university administrators must address this problem through a general reduction of individual teaching loads. Professors require more resources to cope with their growing administrative workload.

### (8) Make full and wider use of flexible pay solutions

Measures must be taken to minimise the loss of income for people joining universities from industry. Professors should have the opportunity to make up some of the financial shortfall by engaging in practical activities (e.g. sideline activities, research grants from industry projects) – and this should in fact be welcomed. In order to keep university professorships attractive, there should be greater flexibility with regard to research, teaching and technology transfer.

### (9) Value and utilise the industry contacts of professors with a background in industry

It is important to communicate the fact that professors with industry experience and a practical focus strengthen university research. It should go without saying that academics who collaborate with industry will remain autonomous and independent. In principle, it should be seen as a positive if professors engage in sideline activities, as long as this does not interfere with their research and teaching.



## Methodological approach

This acatech POSITION PAPER is the result of a broad consultation of actors in the technological sciences and industry. The project group contained representatives of the key technological science fields, technology-intensive industries, and social scientists and humanities scholars engaged in research into the technological sciences. The interim findings were discussed by a wide group of experts and stakeholders from academia and industry. acatech also asked its Senate members' companies and - in conjunction with the Mechanical Engineering Industry Association (VDMA) - a selection of small and medium-sized enterprises for their opinions about the appointment of university professors with industry experience. Cooperation between universities and industry was also discussed at a joint workshop with the Technical University of Berlin on "Knowledge Transfer in the Technological Sciences".

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