meet future needs are essential if the reasonable but ambitious objectives of the Federal Government in the fields of energy efficiency and renewable sources of energy are to be met in a timely fashion.

NO OFF-SETTING AGAINST EXISTING STRATEGIC MEASURES A 1–4

The Expert Commission also emphasises that the funding provided for the Second Recovery Package must not be off-set against measures within the framework of the Higher Education Pact or the Excellence Initiative. The German universities and research institutions need these funds urgently in order to be able to create excellent research conditions and to enrol more students. The key provisions for the continuation of the university pact and the excellence initiative should be in place before the 2009 elections in order to provide planning security. The aim is to maintain the course towards a sustainable improvement of the entire education system. The school discussion must not impede the development of education, research and innovation.

MEDIUM-TERM PROSPECTS – RESEARCH AND INNOVATION 2020 A 2

ELECTION YEAR 2009 A 2–1

Germany is facing a series of elections in 2009, including a federal election. Work must be started well in advance on the preparations for the next legislature period. For this reason, the Expert Commission describes the medium-term political challenges faced by the new government which will come into office at the end of 2009. The comments here follow on from the discussion in the EFI Report 2008.

CHALLENGES A 2–2

Germany faces considerable challenges. The competition from other industrialised countries and the emerging economies is growing. Germany‘s position in research and innovation would come under pressure even if the expenditures for research and innovation were maintained at present levels. To stand still here means going backwards, because other economies are attaching more importance to education, research and innovation. And these countries often react more directly and faster to important developments than Germany does.

Challenges arise in particular from the knowledge intensification in the economy. The demand for highly-qualified professionals is growing and value-creation processes increasingly rely on the production factor knowledge. In contrast there is less and less demand for simple occupations.

The demographic development in Germany is exacerbating this problem, because the German population is ageing rapidly. The immigration of qualified workers is still viewed with scepticism, and the participation of women is still far behind the possibilities, particularly in central areas of research and innovation.

In Germany, the innovation activities of companies are focused on high-value technology, not on cutting-edge technology. This concentration of economic activities has a positive aspect – it is an expression of successful specialisation. But it can also lead to a high level of dependence and dangerous inflexibility, because specialisation is always only an advantage for a limited period. The current problems in the automotive industry make this plain.

Germany cannot do without the contributions of the established, successful sectors. For the foreseeable future they can make an important contribution to export successes and economic growth.

But new sources of value creation and welfare must be drawn on to a greater extent than in the past. R&I policy is in the end also a provision for the future.

A 2–3 KEY STRENGTHS

Germany can draw on important strengths in R&I competition. German universities and research institutions lead internationally in many fields. In the course of the Excellence Initiative, there has been growing competition between the universities and research institutions. The increased autonomy of the universities and research institutions is already showing first benefits in some federal states. German companies are innovative, with advantages not only in research but also in other important areas such as construction, design and marketing. The integration of innovative components in convincing products and plants is still very successful in many sectors in Germany.

In addition, the Federal Government has recognised the challenges: the funds for science, research and development have been increased considerably in recent years. Whereas the expenditure in 2005 was still 11.1 billion euros, the figure in 2008 had risen to 13.4 billion. For 2009 the government envisages expenditure of 14.4 billion euros, not yet taking the Recovery Packages measures into account. With the High Tech Strategy, a very promising form of coordination between government departments has been initiated. These steps point in the right direction, but there is a need for further action in the short and medium term.

A 2–4 NEEDS FOR ACTION – R&I-POLICY 2020

- The German education system, which has historically been a particular strength of the country, has now come under pressure. International comparisons have highlighted weaknesses, in particular in the early phase of education. In addition there are also deficits in innovation-related training in the natural sciences and engineering. For this reason, in its first report the Expert Commission already called for improvements to the education system as a pro-active innovation policy. This demand is still valid.
- Fiscal policy is innovation policy. The German taxation system is hostile to innovation, both with regard to the financing of *mittelstand* companies, and in terms of the financing for new enterprises. Little has been changed in this respect by the company taxation reform in 2008. The creation of an innovation-friendly taxation system and the improvement of the framework conditions for innovation financing are important tasks for the next Federal Government. In this respect, German policy-makers have

long shown a lack of decisiveness. The R&I policy measures are ineffectual if they are undermined by the taxation system. A re-orientation is urgently necessary.

– The global challenge of climate change and the transition to a sustainable economy, in particular to sustainable sources of energy, requires rapid and targeted actions worldwide. Considerable efforts will be necessary, but at the same time there are extensive opportunities for well-positioned high-technology nations. The harmonisation and linking of environmental and R&I policies is becoming increasingly important. Good coordination between political regulation and R&I incentives can help German entrepreneurs to position themselves more effectively in a leading position in the market for environmental goods.
– However, it will not be possible to "protect" domestic suppliers while at the same time offering incentives for the development of sustainable, suitably priced products for the world market.
– The transfer of knowledge to economic applications is hindered because universities and research institutions do not have sufficient freedom to establish appropriate organisational forms or to put incentives in place. An important factor in the use of new knowledge are new enterprises. Here the conditions have been poor for decades. Germany must once again become a land of entrepreneurs in order to be able to use the possibilities of the knowledge society flexibly and in order to secure economic growth and employment opportunities in the long-term.
– Germany is still lagging behind other nations in the process of tertiarisation. Attention is also drawn in this report to the importance of services, in particular knowledge-intensive services. German R&I policy is still excessively focused on technologies and technical products. Important growth opportunities in the services sector can therefore not be fully exploited.
– Innovation processes are profoundly influenced by the provisions of the patenting system and copyright protection measures. There is a growing need for revisions in the responsible institutions, both at the national and at the European level. The shaping of these institutions is not a purely legal problem. Rather it touches on key concerns of R&I policy and therefore requires close coordination, at best within the framework of the High-Tech Strategy. In addition, there is also need for the broadest possible social consensus about how far the protection of intellectual property should go. Terms such as "Trivial patents", "Patents on life", "Software patents" and others show how sensitive the matter can become. The Patent Offices of Europe serve above all the welfare of the people of Europe, not only the interests of the patent holders. Germany and Europe require a qualitative improvement of the protection of intellectual property, and not a one-sided intensification.
– The High-Tech Strategy of the Federal Government was started in August 2006. It has ambitious goals, and the intention is to make Germany one of the world's most innovative nations. The Expert Commission has evaluated the High-Tech Strategy positively – it is an important step to increase the effectiveness of the national policy for research and innovation. In the EFI Report 2008, the Expert Commission also called for a number of improvements, including among other things greater budget transparency, increased focussing on strategic goals, consolidation of the departmental responsibilities, and an increased orientation to services. It is not yet possible to finally evaluate the results of the High-Tech Strategy, and this remains a matter for soundly-based scientific evaluation. Numerous new activities have been started, such as the selection of the first five peak clusters, the innovation alliances, and the Master Plan for Environmental Engineering. Research and innovation policy is always a structural policy and can therefore only be effective over the longer term. Despite the High-Tech Strategy and the considerable extra funding which the Federal Government

has envisaged within the scope of the so-called 6-Billion Programme, there has not yet been an appreciable rise in the macroeconomic R&D-intensity. This was 2.5 percent in 2006, and stagnated at this value in 2007, although an increase to 2.7 percent was intended. According to the statistics so far available, the R&D expenditures of the private sector and the federal states have therefore not reacted to the impulses of the German government to the extent hoped for. This development does not mean that the Three Percent Target is in any way a bad goal for German R&I policy or for business – but it is doubtful whether the target will be reached by 2010.

R&I policies will also require considerable efforts in the coming years. There is an urgent need for even better coordination between government departments, but also between the Federal Government and the *laender*. Despite the positive initial situation, in the medium and long-term the competitive position of Germany is threatened unless research and innovation are strengthened, and major obstructions are removed in the educational sector and in the tax system. But this is not only the responsibility of the state – private actors must also make a contribution.