

## SCIENCE AND TECHNOLOGY PROGRAM - EU

But one cause of concern is a continuing trend of lower spending on R&D by business and government in the EU compared to the United States. The spending gap widened from \$40 billion per year in the middle of the decade to \$75 billion by 1999. This problem is aggravated by duplication, lack of coherence and fragmentation in the EU of research effort, and by limited competition in certain sectors reducing the incentives for companies to fund research. This is occurring at the same time that the interdisciplinary nature of research is becoming more apparent. This is why the development, endorsed the EU Council in March 2000, of a European Research Area is so important to strengthen Europe's research base. It should enable the Union to identify excellence, to strengthen pan-European collaboration and to establish clearer and more consistent priorities for public research. The proposed inter-governmental open coordination method, through its benchmarking and scoreboards of research, innovation and enterprise, will be of value if lessons revealed are learnt and applied by underperforming Member States.

Other factors are also important. At the beginning of the Millennium, the question of human resources in European research is of increasing concern. The EU has fewer researchers as a proportion of its workforce (5.1%) than the USA (7.4%) and Japan (8.9%), and this difference is even more marked in industry. The number of young people is declining and Europe still suffers from a brain drain to the US. In the scientific area, as in other parts of the economy, there is a skills gap and also mobility problems. More needs to be done to make scientific and research careers attractive in Europe. Increased mobility of researchers could also improve the quality of research in Europe.

The EU shares of worldwide scientific publications (37.8% in 1998) and citations (38.2% in 1998) increase rapidly (respectively 1.7% and 2.1% each year), whereas those of the USA (32.9% for publications and 51% for citations) are declining sharply (respectively -2.1% and -0.9% each year). Whilst 47% of European patents are from the EU, the EU accounts for a much smaller proportion of patents in the American and Japanese systems. Americans and Japanese have substantially greater shares of patents in the European system. The launch of the new Community patent by the end of 2001 is long overdue.

Patterns of co-operation in innovation activities between European companies also vary considerably from one Member State to another. In general, firms in Scandinavian countries co-operate more than those in the other Member States.

The overall picture is a very mixed S&T mosaic for the EU, with a few star performers such as Sweden and Finland, but with too many countries not paying enough attention to research and innovation scoreboards.