Executive summary

Chapter 1: Introduction

- This report has been prepared by a group of leading representatives from research-based companies in Europe and the US, at the request of the European Commission's Directorate-General for Research. It is one of a series of initiatives from the DG Research to foster better use of the talent pool of women in science and in science policy. While data exist on the participation of women in publicly funded academic research, relatively little is known about their role in industrial research.
- This report on Women in Industrial Research (WIR) is concerned with Europe as a whole, but concentrates on the 15 European Union (EU) Member States in the year 2002.
- The European Council agreed at the Barcelona summit that the proportion of Gross Domestic Product (GDP) spent on R&D in the European Union (EU) should increase from 1.9% in 2000 to 3% by 2010. This will mean substantially increasing the numbers of researchers: indeed, investment in industrial R&D is expected to double by 2010. Given that it plays the leading role in R&D, this is a major challenge for industry.
- In this report, the position of women in industrial research is analysed and recommendations as to how this talent pool could better be used are presented. At present, women constitute only around 15% of industrial researchers in the EU. As significantly more women are graduating in science and engineering, they are an obvious source of new recruits. In addition, the disproportionate loss of women from scientific careers needs to be overcome. Old-fashioned ideas and practices still impede women's careers in industrial research. Their input into innovation, and creativity of science does not reflect their buying power or their growing role as decision-makers.
- There is a need for more statistics, for monitoring, for scoreboards and for the position of women in industrial research to be benchmarked. This will allow informed policies and practices to be developed. For companies to succeed in recruiting, retaining and promoting women in industrial research, 'special measures' are not enough. There will have to be organisational and cultural change for industry to be competitive. Governments need to support such changes through concerted actions.
- The recommendations are aimed at companies, but also at national governments (who are responsible for creating the necessary framework conditions), at universities and at the European Commission. Concerted action is required at the European level, from companies, governments and from women themselves. Examples of good practice from some of the major industrial research companies that have made a commitment to gender balance and diversity are showcased to show the way forward.

Chapter 2: Why focus on women for science and development?

- Women constitute about 50% of the population world-wide, and they constitute the majority of new graduates in most Western industrialised countries, however, with major differences among disciplines. As they are becoming more significant as consumers, both as individuals and as purchasers and procurers for public and private sector organisations, they need to be better represented in product design and development teams.
- The labour supply in Europe is getting smaller and is ageing: there will be more competition for qualified staff. Multi-skilled, highly creative and innovative inter-disciplinary teams are needed for a globally competitive industrial research: diversity is good for business and for generating new ideas. Companies are increasingly concerned to become not only the supplier, but also the employer of choice, for men and women. Companies in the process of downsizing particularly need to ensure employment of best employees to achieve their goals in the market. Recruiting and retaining good quality industrial researchers as well as other qualified staff is vital in the context of skill shortages.
- Young people are making different lifestyle choices from that of their parents. When choosing a company for whom to work, young people consider which companies offer compensation and benefits that allow flexibility (work/life balance) and have other related policies and supportive structures.
- Different countries offer very different framework conditions for employment, such as parental leave, childcare, eldercare and so on. European companies and their employees therefore operate in a wide range of sets of circumstances. While in the Nordic countries, for example, many support mechanisms are in place, in others, eg Germany, companies may have to compensate for a lack of provision. The lack of harmonisation of policies has clear and significant negative consequences for the mobility of researchers in Europe (compared with the US) and inhibits the ability of companies to recruit the best staff.
- The 'leaky pipeline' in academic life, where qualified women disappear in disproportionate numbers from every stage in the hierarchy and as a consequence, are under-represented in senior decision-making positions, is well documented. There are proportionately even fewer women scientists working in the private sector – in either large companies or in small and medium size enterprises. However, major differences exist among different European countries and among companies. There are some successful examples of companies that have retained female members of the European talent pool for research and development.

Chapter 3: Women in industrial research – an overview

- Cross-national statistics on women in industrial research are presented in this report for the first time. There are significant national differences. While women make up between 18% and 28% of industrial researchers in eight out of ten Member States, in Germany and Austria, the figure remains below 10%. This is despite the fact that German companies contribute a major share to the European R&D budget in industry.
- The statistics show the untapped potential of women in industrial research. More girls need to be attracted to science and engineering to widen the recruitment base. The fact that high potential people are systematically being lost to industrial research is a major cause for concern. Structures to

support a healthy work/life balance need to be in place. Equally, the needs of people returning to industrial research after a career break need to be addressed much more effectively.

- The student body has expanded considerably in recent years and within it, there has been a significant increase in the numbers of women studying at degree level in Europe. Indeed, across all disciplines, women are now the majority of new graduates in every EU Member State except Austria.
- The proportion of women among science and engineering students has grown. In the EU Member States in 2000, women made up 41% of undergraduates in science, mathematics and computing and 20% of those studying engineering, manufacturing and construction subjects.
- Women in the EU Member States are obtaining nearly 40% of all new PhDs (2000). In science, their share is highest in life sciences (50%) followed by mathematics (30%), physical sciences (27%), engineering (20%) and computing (19%).
- As well as better statistics, indicators and bench marking are needed for monitoring progress in retaining and promoting women and men, and to compare the effects of national and industrial policies.

Chapter 4: A vision for 2010 – opportunities and approaches

- Based on the business need for diversity and gender balance, the vision for 2010 set out in this report is one where companies value and develop human talent, and ensure that both women and men have a sensible work/life balance. There should be a gender balance of men and women in laboratories and in senior management, which reflects their roles in society, as decision-makers and as consumers.
- Work cultures and organisations will need to change to embrace researchers with a whole variety of characteristics. This approach fits in with the EU agenda of equal treatment for groups on a range of dimensions such as age, disability, sexual orientation and race and ethnic origin. More women will need to be recruited, retained and promoted. Good practices will need to be fostered in order to develop democratic, inclusive and innovative work cultures in industrial research to release the spark of creativity.
- To promote diversity and gender balance, companies need to treat the individual as a whole person. This involves work/life balance policies that allow employees to accommodate family and caring responsibilities and, if they wish to engage in cultural, religious, community, trade union or other activities. Secondly, there is a 'democratic' principle that entails building a listening culture, where systems and structures are transparent and open. This puts an end to patronage, the 'old boys network' and nepotism and allows for recruitment and promotion based purely on merit.
- The tools to put these principles into practice are different for each equality dimension. For promoting gender equality (known as the 'gender mainstreaming' approach) 'visioning' is important. The company takes a hard look at itself to identify customs and practices that (however inadvertently) have the unintended consequence of structurally disadvantaging women or indeed excluding them from the organisation.

- Other tools to develop a gender balance throughout the organisation are using sex-disaggregated statistics as a management tool, developing equality indicators, and conducting gender impact assessments for new policies.
- Most importantly, commitment from the top is required; incentives to build ownership of the agenda, reporting mechanisms and monitoring. Diversity measurements must be reviewed as an investment and consideration must be given to the cost of not undertaking such measures.

Chapter 5: Entrepreneurs: The lifeblood of the EU economy

- The number of women-owned businesses in Europe is growing but not at as fast a rate as in the US. Women entrepreneurs in Europe tend to have companies in the service sector. Their businesses tend to be smaller and younger than those of men. They are more likely to be sole traders and to use informal means of acquiring start-up capital.
- Information and communication technologies (ICTs) are a top growth business and employment area. Despite the fact that 19% of new PhDs in computing in the EU area are awarded to women, few have so far started an ICT business enterprise.
- The biosciences might seem to be an obvious area for women entrepreneurs, given that the majority of lifescience graduates are women. However, there are very few women among those starting new companies in this field and very few women among senior mangers of existing companies.
- The challenges facing women entrepreneurs include the fact that they are likely to start with less finance than men, have fewer business networks and less business experience. As a consequence, their businesses have a slower growth rate. Women find it difficult to access venture capital but at the same time, they are less likely to apply for it.
- Recommendations focus on: creating a better understanding of the challenges faced by women entrepreneurs; measures designed to help meet some of the challenges already identified (business training, incubators, access to capital) and direct or indirect support for women entrepreneurs (mentors, coaches and role models, and publicising successful case studies).

Chapter 6 Conclusions and recommendations

- If the 3% Barcelona goal is to be reached, the number of researchers in both industry and academia in Europe must be increased drastically. Women who are already highly qualified are obviously the richest untapped potential. Several leading R&D companies are already changing their human resource policies in order to recruit and retain women in science and engineering more effectively. Some European nations are clearly ahead of others in successfully educating women and keeping them involved in the innovation process.
- Companies are one of the key movers in R&D. In order to raise their attractiveness as employers to women, the report provides a checklist of good practices giving examples of corporate level initiatives on implementing a diversity management and gender mainstreaming approach. Being an 'employer of choice' reflects an awareness of societal and cultural changes: this enables companies to become the 'supplier of choice' in a globalised world - another business need!

- The other key movers are governments. In the past in Europe, attempts to include women in the innovation process have been fragmented and limited to individual companies or governments. Hence, on a European scale, success is modest. Public policies must therefore support and/or push company policies. Supportive measures at government level include whole-day schools and tax laws supporting parents – men and women - independent of the classical 'male bread-winner/female homemaker' family model. Pushing measures include laws that encourage companies to provide supporting structures for working parents.
- Concerted actions are a 'must' at the European level to promote changes in social and organisational culture, to foster media awareness and to create new public/private partnerships of companies, universities, schools and other stakeholders at European and regional levels. This report calls for further research into the different national European governmental and company policies, which have led some European nations and companies to lead the way in maximising returns from a broad and diverse talent pool in the innovation process.
- To ensure Europe's competitiveness and the competitiveness of its companies in the future, however, this report also calls upon the European Parliament and the European Commission bodies to adopt and implement good practices, monitoring procedures, and 'buy-in from the top'. This first analysis has identified all of these as crucial for success.