



Conclusions and recommendations

This report focuses on a significant and growing problem for industry and the economy in Europe. Not only is the number of students choosing science decreasing but the number of people in the science and technology pool is already too small to meet recruitment needs in industrial research for the foreseeable future.

In addition, many European companies have been very slow in developing a diverse and gender-balanced workforce in their research and development departments. This is at a time when the global market means that buying power and decision-making is in the hands of an increasingly diverse customer base. Women, in particular, are in a position to offer new business opportunities. Currently, only about 13% of researchers in European industry are women: the numbers are even smaller in individual countries such as Germany (less than 10%). Women may now constitute the majority of graduates overall, but many, if not most, are lost from long-term careers in science and technology.

This is clearly an unacceptable waste of resources; moreover, the gap between supply and demand for highly qualified as well as diverse employees comes at a particularly unpropitious moment. The EU wants to meet the Lisbon summit vision of a 'knowledge-based economy' and the Barcelona summit goal of increasing the proportion of GDP being spent on R&D to 3%. Concerted action between industry and governments is needed now if they are to meet these challenges by recruiting sufficient scientists with diverse views and talents, particularly women, and keeping them updated, creative and motivated through a longer career span. Dedication from the top will be required to remove the barriers to recruiting, retaining and promoting the appropriate mix of highly competitive industrial research teams.

Pressure on those working in industrial research leaves little time for continuing professional development. On the other hand, continuing professional development of employees is now on the agenda of many human resource departments, time is allocated to it and it is a management deliverable. In contrast, time for reflection and structures that allow for a healthy work/life balance for employees remain 'blind spots'. Industrial researchers are just as likely to have children, elderly relatives and other dependants as other employees. Traditional family structures with the 'male

bread-winner’ supported by a ‘female-homemaker’ are no longer the rule, particularly among younger employees.

Hence, it is important to build into work patterns the flexibility for employees to combine work with other commitments and aspirations, such as family responsibilities as well as community or cultural activities. Companies therefore must rethink how industrial researchers are employed in order to keep the most qualified men and women in the innovation process and to ensure a culturally diverse mix.

Understanding the position of women and men in industrial research in Europe is hampered by the lack of reliable, harmonised sex-disaggregated statistics. Even so, the data presented in earlier chapters of this report demonstrate the preponderant loss and under-utilisation of women in industrial research, at all levels, in all countries considered, and across size and type of industry.

While many women are starting to set up their own businesses in Europe, relatively few of them are in technology, or research-based or high-tech start-ups. There is enormous scope here for well-qualified women to identify gaps in the market and create enterprises in industrial research. Such enterprises can be built around new ways of working: they do not have to follow traditional patterns.

The following brief summary of our recommendations focuses on this question: what can companies, national governments and other stakeholders do to increase the number of women in industrial research, both as employees and as entrepreneurs?

What can companies do to increase diversity and the number of women in industrial research?

Detailed recommendations for companies to become leading edge in diversity management and in the employment of women are presented in Chapter 4. In summary, an open-minded, stimulating as well as gender-aware culture should provide:

Box 6.1

‘The vision of our diversity programme is to build an inspiring, innovative and creative culture that everyone wants to belong to and contribute to.

Source: AstraZeneca

- an attractive work environment, which encourages and provides opportunities for innovation, offers career development opportunities in a life-cycle perspective, values output rather than presence and brain hours rather than body hours;
- a commitment from the top to gender equality, diversity policies and dignity at work values – integrated into strategy and action plans, reporting mechanisms and performance review systems;
- a high degree of transparency and two-way communications systems; merit-based open recruitment and staff review systems, monitoring of succession plans and reviews of success criteria in promotions;
- sound work/life balance policies: maternity and paternity leave, child-care facilities or subsidised child-care costs and emergency leave for caring for sick family members (these should be provided by companies if government does not already provide them);
- flexible work schedules (acceptable to both company and employees), opportunities for (some) distance work (subject to laws and regulations and job requirements); flexibility to explore alternatives to excessive travelling

at times in the life cycle, through redeployment or making more use of new technology or reconsideration of the essential features of the job remit;

- modern role models, networking and mentoring schemes;
- monitoring, evaluation, auditing, statistics, surveys, staff consultation, and analyses of recruitment, attrition and exits; and
- partnership arrangements designed to encourage young women into science with local schools, colleges and universities, offering internships, fellowships, role models, mentors, speakers and opportunities for work shadowing.

What can national governments do to increase diversity and the number of women in industrial research?

Framework conditions

National governments have a keen interest in industrial research, given its importance to the economy. They have a key role to play in increasing the recruitment base (the number of trained scientists) and in providing the legal framework and infrastructure (tax laws, child-care facilities, schools) to keep highly qualified researchers, men and women, active and productive in research and development. National governments can support women in industrial research by:

- ensuring effective sex discrimination and ‘equal pay for work of equal value’ legislation is in place, revising the legislation where it is not working properly and ensuring legislation on parental leave is generous;
- collecting, analysing and publishing sex-disaggregated statistics that define and identify **industrial researchers** as a category;
- providing or subsidising sufficient affordable, good quality child-care, supporting private initiatives for eldercare, making tax laws which support parenthood in all types of family, not just the breadwinner/homemaker model;
- commissioning studies of women in industrial research and on the policies and practices of companies in this sector, publishing and disseminating the statistics and research widely;
- using the statistics and research in planning and review of national policies;
- supporting events and networking initiatives like a ‘Girls’ Science Day’, ‘Take Your Daughter to Work Day’, and ‘World Women in Engineering Day’ – and their equivalents in other disciplines where women are in a minority;
- continuing to benchmark support for women in industrial research with other countries through the Helsinki Group, adopting good practice and where appropriate publicising their own good practice.

Box 6.2

‘50-50 by 2020!’

Source: Old US National Science Foundation motto

What can universities, venture capitalists, but also national governments do to increase the number of entrepreneurs, particularly of women in technical-industrial research?

Universities are the main suppliers of qualified people. They could do more to increase entrepreneurialism among science, engineering and technology students and staff, including women, by:

- providing obligatory minimum tuition in business skills to all science and technology students at undergraduate level; and
- providing specialised (incubator) facilities for students who wish to try out innovative proposals while they are still in undergraduate programmes.

Venture capitalists are the gatekeepers of entrepreneurialism. To ensure that their policies and practices do not discriminate against women, however indirectly or inadvertently, we recommend that they:

- monitor applications and those bids that they support, by sex;
- benchmark on the gender dimension with other financial institutions supporting the self-employed and entrepreneurs;
- foster a gender balance among their advisory staff;
- pro-actively encourage applications from women entrepreneurs; including those who may want to run a business part-time;
- be aware of and accommodate the needs of women setting up their own company after a career break;
- foster networking and mentoring schemes by putting interested clients in touch with others; and
- identify business networks that could provide mentors and coaches to women entrepreneurs.

Governments are invited to support women entrepreneurs in science, engineering and technology by:

- providing public funds to match private sources of finance for entrepreneurs;
- supporting universities financially to enable researchers to prototype ideas before they are ready to seek investment for campus companies;
- developing new sex-disaggregated statistics on entrepreneurs in high technology sectors;
- publishing annual sex-disaggregated statistics on inventors named in patents applied for and taken; and
- commissioning research on women entrepreneurs in R&D, to assess the impact of structural limitations imposed by framework conditions.

Conclusion

Research, broadly defined, has been and will continue to be a core issue for European industry. It is where innovative ideas, so crucial to industry, are developed. However, research goals, research technologies and those using research results are changing quickly in a globalised economy.

The vibrancy of industrial research in Europe depends upon drawing on a wider pool of talent and ideas, including more women who are currently so under-represented. Women are the majority of graduates and are moving into key buying and decision-making powers as consumers. To ensure the competitiveness of European industry on a global scale, organisations and their cultures need to be challenged and to change.

Companies need to develop a commitment to diversity and introduce better work/life policies as well as improved recruitment, retention and career development policies and practices, for men and women, reflecting the diverse cultures and to ensure that they can serve the markets of the future.

The European Union must provide the legal framework and infrastructure to support such changes and ensure that all their actions lead to a concerted approach between governments and industry across Europe. Equal standards and deliverables by national governments with respect to fostering diversity, ensuring the use of the full talent pool of women for research and development and ensuring equal opportunities and mobility across Europe must become a prime goal.

We have examples, from Europe and beyond, of good practices in organisational and cultural change and in government policies. We recommend that governments and the industrial sector explore these good practices, and adopt them, where and as appropriate. Through concerted action, European industry must be better prepared to meet tomorrow's challenges.

