



Gender in research

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The European Institute for Gender Equality (EIGE) is the EU knowledge centre on gender equality. EIGE supports policy makers and all relevant institutions in their efforts to make equality between women and men a reality for all Europeans by providing them with specific expertise and comparable and reliable data on gender equality in Europe.

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1. Relevance of gender in the policy area

European research still shows a pronounced under-representation of women, particularly in the so-called hard sciences and in leadership positions. Gender equality in research is essential not only for fairness, but because it could help address current and future deficits in skilled labour within the EU ⁽¹⁾.

This reality reflects an inefficient use of highly skilled women in the EU, which is a considerable loss of talent ⁽²⁾. The annual increase in women researchers is less than half the annual number of women PhD graduates. This indicates that, on an annual basis, fewer than half of the women completing PhDs are becoming professional researchers. Moreover, according to the European Commission's *She figures 2012*, women accounted for just 33 % of European researchers in 2009 ⁽³⁾. In 2011, women in the EU still made up around 33 % of researchers in all sectors, showing that under-representation in this profession persists ⁽⁴⁾.

In addition to the low percentage of women researchers, women are also under-represented in top-level and decision-making positions in European research. The European Commission's *She figures* ⁽⁵⁾ show that despite progress, gender inequalities in science persist. For example, while women represented 59 % of EU graduate students in 2010, only 20 % of senior academics in the EU were women. The evolution in the proportion of women in academic positions between 2010 and 2013 confirms that women continue to be under-represented in top positions within the higher education sector. Women are also historically under-represented as the head of higher education institutions (only 15.5 % in 2010). However, recent data indicate that women have gained some ground since 2010, as the proportion of women heads of institutions increased to 20 % in 2014 ⁽⁶⁾.

Extensive research has been undertaken into the reasons and mechanisms that keep women away from research and from moving up the career ladder in this field. Studies have revealed gender discriminatory practices such as biased recruitment, promotion and funding processes and criteria. There is also a strong influence of gender stereotypes in relation to science ⁽⁷⁾. Gender discrimination in science may take different forms, sometimes overt, but most often subtle and hidden. It may operate even in highly formalised and seemingly gender-neutral peer-review processes or selection and promotion procedures ⁽⁸⁾.

Conventional research agendas often fail to take into account sex and gender differences and to distinguish different possible impacts related to gender. This phenomenon leads to omissions and distortions and may also result in missed market opportunities. In addition, integrating sex and gender analysis into research sparks creativity by offering new perspectives, new questions, and opening new areas of research ⁽⁹⁾.

Gender equality in research is thus still influenced by a set of persistent gender inequalities, as summarised below:

- gender segregation in research and science;
- gender-related career challenges;
- gender imbalance in senior positions in academia;
- gender bias in access to research funding;
- gender-blind and gender-biased research;
- gender-blind and gender-biased organisational culture and institutional process.

(1) European Commission — Directorate-General for Research and Innovation, *Facts and figures*, 2014, http://ec.europa.eu/research/era/pdf/era_progress_report2014/era_facts&figures_2014.pdf.

(2) European Commission, *Meta-analysis of gender and science research*, 2012, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/meta-analysis-of-gender-and-science-research-synthesis-report.pdf.

(3) European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2013, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

(4) European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2015, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf.

(5) European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2013, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

(6) European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2015, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf.

(7) European Commission — Directorate-General for Research, *Mapping the maze: getting more women to the top in research*, 2008, http://ec.europa.eu/research/science-society/document_library/pdf_06/mapping-the-maze-getting-more-women-to-the-top-in-research_en.pdf.

(8) Husu, L., *Gender equality in Finnish academia: contradictions and interventions*, paper presented to the Training and Research Network Women in European Universities, 2008, http://csn.uni-muenster.de/women-eu/download/HusuCP01_02.pdf

(9) genderSTE — a policy-driven targeted network funded by the European cooperation in science and technology (COST). http://www.genderste.eu/i_research01.html.



2. Gender inequalities in the policy area — main issues

Gender segregation in research

Gender segregation in education is widely acknowledged as one of the root causes of different choices made by women and men about their field studies in research. In spite of the efforts to change this situation over the last decades, choices of fields of study remain largely gendered⁽¹⁰⁾.

According to data gathered in *She figures*, gender segregation in research is eroding; however major differences among subject areas are still persistent⁽¹¹⁾. While men comprise the vast majority of those at the masters and PhD levels in natural science and technology subjects, women tend to dominate in medicine and health sciences⁽¹²⁾.

Research shows that gender segregation in research is driven by the same root causes as gender segregation in the labour market as a whole: gender stereotypes, choice of study field, gender division of labour and time constraints, and covert barriers and biases in organisational practices. In general, the influence of these factors seems to be diminishing among the younger cohorts of highly qualified women⁽¹³⁾.

Women in scientific research remain a minority, accounting for 33 % of researchers in the EU-28 in 2012. However, the proportion of women is growing faster than that of men (4.8 % annually over the period 2005-2011, compared with 3.3 % for men)⁽¹⁴⁾. Another positive trend is that women's compound annual growth rate is higher among researchers than among highly educated professionals and technicians

(5.4 % for women and 3.9 % for men over the period 2002-2007). On average in the EU-27 in 2009, women represented 40 % of all researchers in the higher education sector, 40 % in the government sector, and 19 % in the business enterprise sector; in all 3 sectors, however, there is a move towards a more gender-balanced research population⁽¹⁵⁾. Within the higher education sector, the gender imbalance varies depending on the field in which researchers work. Women researchers are particularly under-represented in engineering and technology and the natural sciences⁽¹⁶⁾. In the EU-27, 45 % of all PhD graduates in 2006 were women; they equalled or outnumbered men in all broad fields of study except for science, mathematics and computing (41 %), and engineering, manufacturing and construction (25 %). There are signs of progress towards gender equality among top level graduates (ISCED 6: postgraduate programmes above master's level). Women made up 47 % of these graduates in the EU in 2012.

Gender-related career challenges

Despite making progress, women scientists seeking to climb the career ladder still face many barriers⁽¹⁷⁾. In 1999, the European Technology Assessment Network (ETAN) report⁽¹⁸⁾ described the situation of women scientists in universities, research institutes and academies at that time, mentioning the continuous drop in the numbers of women at each level of the academic ladder.

⁽¹⁰⁾ European Commission, *Meta-analysis of gender and science research*, 2012, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/meta-analysis-of-gender-and-science-research-synthesis-report.pdf.

⁽¹¹⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2013, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

⁽¹²⁾ The Research Council of Norway, *Gender balance and gender perspectives in research and innovation*, 2014, <http://genderedinnovations.stanford.edu/Norway2014Policy.pdf>.

⁽¹³⁾ European Commission's Expert Group on Gender and Employment (EGGE), *Gender segregation in the labour market. Root causes, implications and policy responses in the EU*, report prepared by F. Bettio and A. Vershchagina (eds.), Publications Office of the European Union, 2009, Luxembourg.

⁽¹⁴⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2015, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she-figures_2015-leaflet-web.pdf.

⁽¹⁵⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2013, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

⁽¹⁶⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2013, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

⁽¹⁷⁾ Langberg, K., *Gender-gap and pipeline-metaphor in the public research sector*, paper prepared for the OECD international workshop on women in scientific careers, November 2005, 2006.

⁽¹⁸⁾ ETAN, *Science policies in the European Union: Promoting excellence through mainstreaming gender equality*, 2000, <http://www.cordis.lu/improving/women/documents.htm>.

This phenomenon is referred to by the image of a leaky pipeline. Ever since Berryman⁽¹⁹⁾ (1983) introduced this conceptual approach, the process of becoming a researcher has been conceptualised as a 'pipeline'. This image refers to the normative sequence of educational and employment stages that typically comprise a scientific career. From this point of view, the decreasing proportion of women moving up the educational/professional hierarchy is attributable to women's higher rates of attrition from the science pipeline: at each moment of transition from one educational/professional stage to another, the pipeline loses more women than men⁽²⁰⁾.

All in all, the leaky educational pipeline, going back as early as childhood, is partly responsible for the uneven number of women and men in faculty positions at universities across the world. These leakages are well documented in relation to science, technology, engineering and mathematics (STEM)⁽²¹⁾ and other research areas.

The proportion of women on boards adds interesting information to this overall pattern. In general, board data cover scientific commissions, R & D commissions, boards, councils, committees and foundations, academy assemblies and councils, as well as different field-specific boards, councils and authorities. These boards exercise a crucial power of influence on the orientation of research. On average in the EU-27, 36 % of board members were women in 2010, whereas in 2007 they represented only 22 %⁽²²⁾.

Women's opportunities to enter leadership positions often strongly depend on those controlling the selection and admission processes, often referred to as 'gatekeepers'. In the political sphere, these are political parties and party elites, whereas selection committees fulfil this function in social and economic decision making.

Women are particularly under-represented among academic gatekeepers and in leading positions in research organisations. According to the ETAN report (2000)⁽²³⁾, the

gatekeepers of research funding in Europe are to a large extent constituted by middle-aged men academics. Such male domination also applies to countries such as Sweden, Luxembourg and the Netherlands where women represent close to 50 % of the board members⁽²⁴⁾.

Gender imbalance in senior positions in academia was shown in the 2010 *She figures* data⁽²⁵⁾; there appeared to be clear vertical segregation in academic and research institutions. Women constitute over half of university graduates, but the pipeline starts to leak at the PhD level, with more men receiving a PhD degree on average in the EU. Differences become much more pronounced in the highest positions in academia. The proportion of women was the smallest at the top of the academic hierarchy, with women making up just 20 % of Grade A academic staff (the single highest grade/post at which research is normally conducted). Women researchers at Grade B (working in positions less senior than top positions but more senior than newly qualified PhD holders) and Grade C (the first grade/post which a newly qualified PhD (ISCED 6) graduate would normally hold) constituted 37 % and 44 % of staff respectively.

A comparison between 2002 and 2010 shows an improvement in the proportion of women at the different steps of the academic career ladder: the percentage of women increased from 15 % to 20 % at Grade A, from 32 % to 37 % at Grade B and from 40 % to 44 % at Grade C.

Another visible trend illustrating women's under-representation at the highest levels of academia is the data on women heading universities or research institutions and women on the boards of universities and research institutions. The latest figures show that only 10 % of EU universities or assimilated institutions (based on capacity to deliver PhDs) are headed by a woman rector.

Women not only face a glass ceiling when advancing to higher positions, they are also less likely to obtain research grants. In addition, they need to produce more high-quality papers in order to be successful⁽²⁶⁾.

⁽¹⁹⁾ Berryman, S., *Who will do science? Trends, and their causes in minority and female representation among holders of advanced degrees in science and mathematics*, New York, Rockefeller Foundation, 1983, <http://eric.ed.gov/?id=ED245052>.

⁽²⁰⁾ Polkowska, D., 'Women scientists in the leaking pipeline: Barriers to the commercialisation of scientific knowledge by women', *Journal of Technology Management and Innovation*, Vol. 8, No 2, 2013, online ISSN: 0718-2724, http://www.scielo.cl/scielo.php?pid=S0718-27242013000200013&script=sci_arttext.

⁽²¹⁾ Varmaa, R. and Hahn, H., 'Gender and the pipeline metaphor in computing', *European Journal of Engineering Education*, Vol. 33, No 1, 2008, pp. 3-11, <http://www.tandfonline.com/doi/abs/10.1080/03043790701745936>; Blockenstaff, J., 'Women and science careers: Leaky pipeline or gender filter?', *Gender and Education*, Vol. 17, No 4, 2005, pp. 369-386, <http://www.tandfonline.com/doi/abs/10.1080/09540250500145072>.

⁽²²⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2013, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

⁽²³⁾ ftp://ftp.cordis.europa.eu/pub/improving/docs/g_wo_etan_en_200101.pdf

⁽²⁴⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2015, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf.

⁽²⁵⁾ European Commission, *She figures: gender in research and innovation, statistics and indicators*, 2015, https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf.

⁽²⁶⁾ Gannon, F., Quirk, S. and Guest, S., 'Searching for discrimination: Are women treated fairly in the EMBO postdoctoral fellowship scheme?', *EMBO Reports*, Vol. II, No 8, 2001, pp. 655-657, doi: 10.1093/embo-reports/kve170; European Commission, *Science policies in the European Union: promoting excellence through mainstreaming gender equality*, Directorate-General for Research, prepared by the ETAN Expert Working Group on Women and Science, Office for Official Publications of the European Communities, 2000, Luxembourg, ftp://ftp.cordis.europa.eu/pub/improving/docs/g_wo_etan_en_200101.pdf; and Research Council UK, *Diversity*, 2013, from <http://www.rcuk.ac.uk/funding/diversity/>.



Given that decisions about promotion might very much depend on the composition of the evaluation panel or committee, gender balance in these committees is crucial. In order to ensure a more just research agenda in the future and improve the quality of research, as well as the relevance and accountability of its outputs to all members of society, stronger measures supporting gender balance on the boards of academic and research institutions are necessary ⁽²⁷⁾.

In summary, the glass ceiling effect is strongly pronounced in the low representation of women in decision making in academia. Despite an improved proportion of women at the different steps of the academic career ladder, women constitute a minority among the top levels of the academic hierarchy. In 2010 only a minority of institutions in the tertiary education sector were headed by women and around a third of the board members were women.

Gender bias in access to research funding

In order to maintain autonomy and ensure scientific excellence, access to research funding should be based on merit and individual scientific achievements. Scientific excellence, however, is not an absolute term but a composite of several determinants. Research funded by the European Commission ⁽²⁸⁾ revealed that the term 'excellence' may hide several gender biases.

Despite the diversity of research institutions in EU countries, some common trends can be identified with regard to gender differences in access to research funding ⁽²⁹⁾.

First, while in many cases success rates in funding are regularly monitored and published, the gender of the applicants and awardees is not followed up, and the success rates by gender are either not calculated or this information is not published. Second, all-male boards, committees and evaluation panels still exist in many countries, and this is the case even in countries where the proportion of women in research is high. This may influence orientation and priorities in research as well as the gender equality policies of the funding organisations. This lack of women in gatekeeping positions gives the image of an organisational system that

is unwelcoming to women. Furthermore, the absence or heavy under-representation of women among evaluators and decision makers means that women researchers are offered fewer opportunities to gain valuable understanding of the research funding system, as seen from the inside, which undoubtedly would promote their own success. Third, evaluation is generally based on criteria relating to the scientific quality of the researchers and the project, criteria relating to the pertinence of the project with regard to the funding scheme, and often on other national criteria and criteria of social relevance. However, the recruitment of peer reviewers often remains opaque and gender is only rarely mentioned among the evaluation criteria. A fourth and important conclusion is that, based on the available data, one cannot conclude that women's success rates are systematically lower than men's. Concerning the application rate, the proportion of women applicants is lower than the proportion of potential applicants in practically all funding systems and most disciplines. The report also highlights that little research exists on application behaviour in general and especially on its gender patterns. Finally, important gender imbalances are observed among the awardees of highly prestigious grants, positions or prizes in many countries.

Among the issues covered above, the role of gatekeepers is crucial, though it is still a neglected topic in studies of gendered patterns in scientific research and academia. Gatekeepers are undoubtedly in a key position to influence the definition, evaluation and development of scientific excellence. More generally, gatekeeping processes can control or influence entry into or access to a particular arena, the allocation of resources and information flows, the setting of standards, the development of the field and the scientific agenda. They can also preserve the external image of the arena. On the one hand, gatekeeping can function as a means to exclude and control, but on the other hand, it can also facilitate and provide opportunities and resources ⁽³⁰⁾.

⁽²⁷⁾ European Commission, *She figures 2012: gender in research and innovation, statistics and indicators*, Publications Office of the European Union, 2013, Luxembourg, http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.

⁽²⁸⁾ European Commission, *Gender and excellence in the making*, 2004, <https://www.uni-frankfurt.de/41563255/GenderMainstreaming.pdf>.

⁽²⁹⁾ European Commission, *The gender challenge in research funding: assessing the European national scenes*, 2009, http://ec.europa.eu/research/science-society/document_library/pdf_06/the-gender-challenge-in-research-funding-report_en.pdf.

⁽³⁰⁾ Husu, L., 'Gate-keeping, gender equality and scientific excellence', in E. Addis and M. Brouns (eds.), *Gender and excellence in the making*, Office for Official Publications of the European Communities, 2004, Luxembourg, pp. 69-76.

Gender-blind and gender-biased research

Because sex and gender are fundamental determinants of the organisation of life and society, recognising and taking into account these differences is paramount in the creation of scientific knowledge. Nevertheless, much research is still gender blind or gender biased. This happens, for example, when research results are extrapolated to the population as a whole, without due consideration of the sample composition.

Gender-blind and gender-biased organisational culture and institutional processes

In universities and research institutions, the majority of crucial decision-making procedures were established at a time when the presence and impact of women was limited. Although slow, 'structural change' to make universities and research institutions more gender-aware and thereby modernising their organisational culture has been evolving over the years ⁽³¹⁾.

There is research evidence that shows how the integration of gender analysis in research processes can lead to innovation, full use of talent, an appeal for scientific careers and an increase in the quality of scientific research ⁽³²⁾. A well-established body of research findings demonstrates the manner in which largely unexamined errors in the way of assessing merit create inequitable outcomes for men and women. Research also demonstrates that despite good intentions and a commitment to fairness, both men and women are likely to undervalue women's accomplishments. This tendency is not surprisingly embedded in institutional processes such as recruitment, performance evaluation and advancement ⁽³³⁾.

At the same time, the creation of a gender-friendly environment is a necessary preliminary condition to achieve positive changes in gender relations within research institutions. This would need to face a series of organisational and management barriers involving issues such as the allocation of resources, the arrangement of working hours and contracts, and intra-organisational and interpersonal rivalries that characterise all organisations, especially complex ones ⁽³⁴⁾.

⁽³¹⁾ European Commission, *Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation*, 2012, https://ec.europa.eu/research/science-society/document_library/pdf_06/structural-changes-final-report_en.pdf.

⁽³²⁾ <http://ec.europa.eu/research/science-society/index.cfm?fuseaction=public.topic&id=1281>

⁽³³⁾ <http://maxweber.hunter.cuny.edu/psych/faculty/valian/docs/2005/BeyondGender.pdf>

⁽³⁴⁾ http://www.retepariopportunita.it/Rete_Pari_Opportunita/UserFiles/whist/whist_gl_def_ok_28112011.pdf



3. Existing gender equality policy objectives at the EU and international levels

EU level

European Council

In 1999, the European Council adopted a resolution on women and science ⁽³⁵⁾ in which the question of the under-representation of women in the field of scientific and technical research was recognised. The resolution also recognises that 'the gender mainstreaming of research policy is not limited to promotion of women as research workers but should also ensure that research meets the needs of all citizens and contributes to the understanding of gender-relevant issues'.

With the Treaty of Lisbon, gender equality has become a strategic objective for the development of both the EU and the Member States. Indeed, in 2000 the Lisbon Council set out the objective of making the EU the most competitive and knowledge-based economy in the world, capable of achieving sustainable economic growth with more and better jobs and greater social cohesion. To this end, it was established that by 2010 women should represent at least 25 % of positions in the public research sector, so as to ensure better representation of women in decision-making bodies.

European Commission

Following the Treaty of Amsterdam of 1999, which established equality between women and men as a specific task of the EU and a horizontal objective affecting all Community tasks, the European Commission formalised its commitment to advance gender equality in research in its Communication 'Women and science: mobilising women to enrich European research' ⁽³⁶⁾. In this document the European Commission stressed the importance of the exchange of experience between Member States and of promoting women's participation in a research-financed EU. The Commission also acknowledges the severe under-representation of women in science and sets out an action plan to promote gender equality in science. Gender equality is to be understood in terms of the three dimensions that characterise the relationship between the issues of gender and

science. In the 1999 EU communication, these three dimensions were referred to as 'by, for, and about', i.e. recognising the need to promote research by, for and about women.

Within the fifth framework programme (FP5) (1998-2002) several efforts were made to promote gender equality in framework programme activities. This approach was broadened and reinforced during the implementation of the sixth framework programme (FP6) (2002-2006), which established two main objectives: a target of 40 % women's representation in committees, groups and panels and the integration of the gender dimension in research content. Further FPs give continuity to these two goals in order to foster scientific excellence.

In order to feed the policy process and give a common and solid basis for policy dialogue, the Commission services mandated a group of experts to analyse the situation and the challenges arising from it and to put forward policy recommendations. This group delivered a report in November 1999, the so-called ETAN report ⁽³⁷⁾, describing the current situation of female scientists in universities, research institutes and academies and stressing the continuous drop in the numbers of women at each level of the academic ladder.

In more recent years, the European Commission has addressed gender equality in research in two different ways: through its main funding instrument, Horizon 2020, and within the European Research Area (ERA) in collaboration with Member States.

In Horizon 2020, gender is a cross-cutting issue and is mainstreamed in each of the different parts of the work programme, ensuring a more integrated approach to research and innovation (R&I).

⁽³⁵⁾ Council Resolution of 20 May 1999 on women and science (1999/C 201/01).

⁽³⁶⁾ European Commission, Communication from the Commission of 17 February 1999, 'Women and science: mobilising women to enrich European research', COM(99)76 final, https://cordis.europa.eu/pub/improving/docs/g_wo_co_en.pdf.

⁽³⁷⁾ European Commission, *Science policies in the European Union: promoting excellence through mainstreaming gender equality*, 2000, ftp://ftp.cordis.europa.eu/pub/improving/docs/g_wo_etan_en_200101.pdf

The legal basis reference document for the Horizon 2020 specific programme document ⁽³⁸⁾ states (on page 10) that ‘Promoting gender equality in science and innovation is a commitment of the Union. In Horizon 2020, gender will be addressed as a cross-cutting issue in order to rectify imbalances between women and men and to integrate a gender dimension in research and innovation programming and content.’

In particular, three objectives underpin the strategy on gender equality in Horizon 2020:

- fostering gender balance in research teams, in order to close the gaps in the participation of women;
- ensuring gender balance in decision making, in order to reach the target of 40 % of the under-represented sex in panels and groups, and 50 % in advisory groups;
- integrating the gender dimension in R&I content and helping to improve the scientific quality and societal relevance of the produced knowledge, technology and/or innovation.

The science with and for society work programme ⁽³⁹⁾ funds specific initiatives in support of the gender equality strategy. Support is given to research performing organisations and research funding organisations in order to:

- remove barriers that generate discrimination against women in scientific careers and decision making (supporting research organisations to implement gender equality plans);
- integrate a gender dimension in research content.

The most important expected impacts of this programme are as follows.

- Reaching a critical mass of universities and research institutions in Europe which implement long-term institutional change through gender equality plans.
- Increasing the participation of women in research, improving their careers and achieving gender balance in decision making.

- Increasing the scientific quality and societal relevance of produced knowledge, technologies and innovations by integrating an in-depth understanding of both genders’ needs, behaviours and attitudes. This also contributes to the production of goods and services better suited to potential markets.

The creation of the ERA was proposed by the European Commission in its Communication ‘Towards a European research area’ ⁽⁴⁰⁾ of January 2000. The objective of creating the ERA was endorsed by the EU shortly afterwards, at the March 2000 Lisbon European Council meeting. The issue of women and science is at the core of the ERA. The strategic objective of the ERA calls for an intensification of action that is needed to promote gender equality in science. Only by ensuring greater gender equality in science, in its widest sense, can science optimise the value that it brings to European society. The ERA pursues three objectives, namely: gender equality in careers; gender balance in decision making; and the integration of the gender dimension in the content of research.

Since 2012, gender equality has been one of the key priorities of the Reinforced European Research Area Partnership for Excellence and Growth. To this end, Member States have been invited to remove barriers to the recruitment, retention and career progression of women researchers, to address gender balance in decision making and to strengthen the gender dimension of research programmes.

European Parliament

The European Parliament adopted a resolution in February 2000 ⁽⁴¹⁾ calling on Member States to increase the number of scholarships available to women in research and to pursue the goal of gender balance in scientific research at the national level.

In 2008 it adopted a resolution on women and science ⁽⁴²⁾. This resolution identifies possible intervention measures, including:

- enhanced monitoring of the situation of women in this field, since data broken down by gender are still insufficient;
- new training criteria for evaluation committees, requiring a balanced composition in terms of gender representation;

⁽³⁸⁾ Council Decision of 3 December 2013 establishing the specific programme implementing Horizon 2020 — the framework programme for research and innovation (2014-2020), http://ec.europa.eu/research/participants/data/ref/h2020/legal_basis/sp/h2020-sp_en.pdf.

⁽³⁹⁾ European Commission, *Horizon 2020: work programme 2014-2015: science with and for society*, 2013, http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-swfs_en.pdf#14.

⁽⁴⁰⁾ European Commission, *Towards a European research area*, 2000, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2000:0006:FIN:EN:PDF>.

⁽⁴¹⁾ European Parliament resolution, adopted 3 February 2000 (PE 284.656).

⁽⁴²⁾ European Parliament resolution of 21 May 2008 on women and science, <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P6-TA-2008-0221>.



- introduction of evaluation criteria for research projects that pay particular attention to the presence of women in research units;
- criteria for personnel and research that go beyond criteria based on number of publications and consider other abilities, such as the ability to team-up research and train young talent;
- financial resources intended specifically to support projects proposed by women, who typically encounter greater difficulty in accessing research funding;
- measures to encourage women to undertake scientific and technology training paths.

More recently, the European Parliament drafted a resolution on 'progress on equality between women and men in the European Union' in 2013⁽⁴³⁾. In it, Parliament 'calls on the Commission and the Member States to implement proactive policies to encourage women to embrace careers in science and to promote, through information and awareness-raising campaigns in particular, entry by women into sectors traditionally viewed as "male", notably the sciences and new technologies, with a view to benefiting fully from the human capital represented by European women'.

International level

Council of Europe

The Council of Europe from its inception has considered equality between women and men, in all spheres of public and private life, as a fundamental principle of human rights and democracy.

More specifically, in the field of promoting gender equality in education, the Council of Europe gender equality strategy 2014-2017⁽⁴⁴⁾ specifies that Council of Europe action will focus on promoting a balanced participation of women and men in political and public decision making. Actions undertaken by European countries will seek to achieve balanced participation, inter alia, in any decision-making body, assuring that the representation of either women or men should not fall below 40 %. Although no specific sectoral references are envisaged, balanced participation of women and men could be interpreted as a goal to be achieved in

all sectors of public decision making, including the research and science fields, and at an academic level.

United Nations

In ratifying the United Nations Convention on the Elimination of All Forms of Discrimination against Women⁽⁴⁵⁾ (1979), states have made commitments to ensure equal rights for women and men in the field of education (Article 10), and to assure the same conditions for career and vocational guidance and access to studies and for the achievement of diplomas in educational establishments of all categories. This equality shall be ensured in pre-school, general, technical, professional and higher technical education, as well as in all types of vocational training.

Furthermore, the Beijing Platform for Action (BPfA) adopted at the United Nations Fourth World Conference on Women⁽⁴⁶⁾ urged governments to take action to combat the continuous discrimination against women, which still persisted across countries as they prepared to enter the 21st century. Strategic objective B.3. 'Improve women's access to vocational training, science and technology and continuing education' outlines a number of actions to be undertaken by governments. These include diversifying vocational and technical training and improving the access of women and girls to, and their retention in, education and vocational training in such fields as science, mathematics, engineering, environmental sciences, technology, information technology and high technology; developing curricula and teaching materials; and formulating positive measures to ensure women's better access to and participation in technical and scientific areas, especially areas where they are not represented or are under-represented.

In accordance with its multi-year programme of work for 2010-2014, the Commission on the Status of Women (CSW) considered 'Access and participation of women and girls to [and in] education, training, science and technology, including for the promotion of women's equal access to full employment and decent work' as its priority theme during its 55th session in 2011. In order to contribute to a fuller understanding of the issue and to assist the CSW in its deliberations, the United Nations Division for the Advancement of Women, in collaboration with the United Nations Educational, Scientific and Cultural Organisation (Unesco), convened an expert group meeting (EGM) on gender, science and technology in 2010.

⁽⁴³⁾ European Parliament resolution of 10 March 2015 on progress on equality between women and men in the European Union in 2013, <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2015-0050+0+DOC+XML+V0//EN>.

⁽⁴⁴⁾ https://www.coe.int/t/dghl/standardsetting/equality/02_GenderEquality-Programme/Council%20of%20Europe%20Gender%20Equality%20Strategy%202014-2017.pdf

⁽⁴⁵⁾ United Nations, *The convention on the elimination of all forms of discrimination against women*, 1979, <http://www.un.org/womenwatch/daw/cedaw/text/econvention.htm>.

⁽⁴⁶⁾ Beijing Platform for Action adopted at the United Nations Fourth World Conference on Women, 1995, <http://www.un.org/womenwatch/daw/beijing/pdf/BDPfA%20E.pdf>.

The EGM explored the gender dimensions of science and technology and identified policies and programmes that can accelerate progress towards internationally agreed development goals, including the Millennium Development Goals. It examined strategies for:

- increasing women's access to and use of technology, including more gender-responsive products;
- increasing women's access to and participation in science and technology education and training;
- eliminating barriers to women's participation in science and technology employment.

The EGM provided input for the report of the Secretary-General to the CSW⁽⁴⁷⁾ (E/CN.6/2011/3) and for the outcome of the CSW, the agreed conclusions and the set of policy recommendations to be implemented by all stakeholders⁽⁴⁸⁾.

UNESCO

Another UN agency, Unesco, is required to promote gender equality as part of its mandate. Unesco is one of the leading specialist UN agencies with a mandate covering five programme areas: education, natural science, social and human sciences, culture, communication and information. These core areas of Unesco's mandate are all crucial for advancing the global gender equality agenda.

In this context, and given its mandate in science and its past work on women in science, Unesco has a key role to play in taking up these issues and working to overcome gender disparities in access to, influence over, and use of STEM. In the last 30 years, Unesco's science policy team has conducted studies on the role of women in science and the gender dimensions of policies related to the development and application of science and technology for sustainable development. It has supported the publication of one of the most comprehensive manuals on gender indicators in science and engineering.

Unesco's Natural Sciences Sector works towards providing strong role models for women and girls in science throughout the world, thereby building the capacities of women in STEM. The STEM and Gender Advancement project also aims to contribute to reducing the gender gap in STEM fields

in all countries and at all levels of education and research by determining, measuring and assessing sex-disaggregated data, as well as by undertaking an inventory of policy instruments that affect gender equality in STEM, in order to generate new and improved indicators to support future evidence-based policymaking. In addition, the sector works to promote women's participation in high-level processes that shape the science agenda and science policies, thus ensuring that the unique perspectives of women scientists and women knowledge holders are incorporated into solutions to the various challenges (climate change, biodiversity loss, freshwater management, health of the oceans, developing green industries and societies) contained within the advancement of sustainable and equitable development. <http://www.unesco.org/new/en/natural-sciences/priority-areas/gender-and-science/>

⁽⁴⁷⁾ United Nations Commission on the Status of Women, *Access and participation of women and girls in education, training, science and technology, including for the promotion of women's equal access to full employment and decent work: report of the Secretary-General* (E/CN.6/2011/3), http://www.un.org/ga/search/view_doc.asp?symbol=E/CN.6/2011/3.

⁽⁴⁸⁾ United Nations, *Agreed conclusions on access and participation of women and girls in education, training and science and technology, including for the promotion of women's equal access to full employment and decent work*, http://www.un.org/womenwatch/daw/csw/csw55/agreed_conclusions/AC_CSW55_E.pdf.

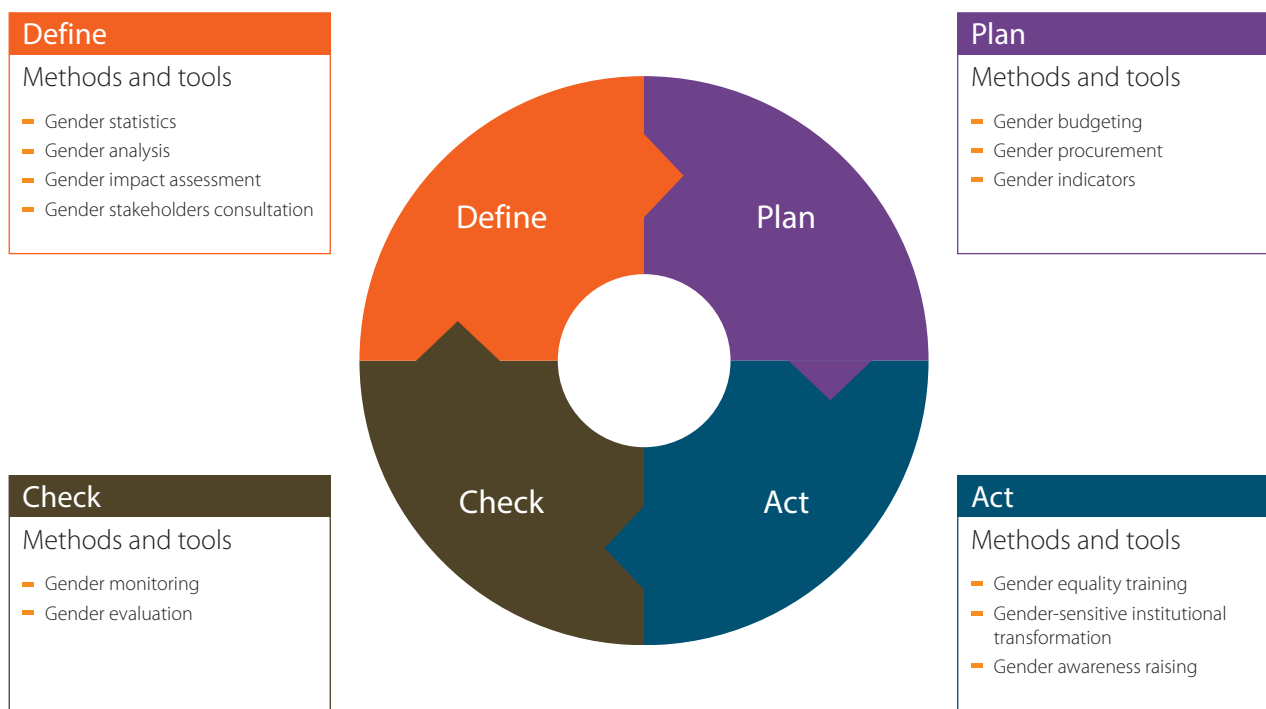
4. How and when? Research and the integration of gender into the policy cycle

The gender dimension can be integrated in all phases of the policy cycle.

Below you will find useful resources and practical examples for mainstreaming gender into research policies. They are organised according to the most relevant phase of the policy cycle they may serve.

Within the research sector, mainstreaming gender means taking into consideration three different objectives: gender balance in research teams, gender balance in decision making and gender dimension in research content. The first objective is related to all the actions that stress the importance of including female scientists in the research team as it facilitates the participation of women in research

contrasting their under-representation in teams bringing, at the same time, the perspective of female scientists in the analysis process. The second objective is related to all the actions aimed at considering the equal presence of women and men researchers among the top levels of the academic hierarchy. The third objective is related to all actions aimed at taking into account gender as a significant variable within any research content. This process of engendering research does not change the scope of the research; it provides new perspectives, raises new questions, and uses new analysis tools to create a more complete picture of the problem. As men and women have different roles and different power, their perspectives on a problem can be quite different. By combining their different experiences and viewpoints, researchers can enhance the comprehension of a problem.



Define

DEFINE PLAN ACT CHECK

In this phase, it is recommended that information is gathered on the situation of women and men in a particular area. This means looking for sex-disaggregated data and gender statistics, and checking for the existence of studies, programme or project reports and/or evaluations from previous periods.

Examples of gender and research statistics

The European Commission, Directorate-General for Research and Innovation's *She figures* report is the main source of pan-European comparable statistics on the state of gender equality in R&I.

Published every 3 years since 2003, *She figures* is the European Commission's publication that presents human resource statistics and indicators in the research and technological development (RTD) sector and on gender equality in science. It provides information on the situation of women in science and research, based on data collected every 3 years by the European Commission's Directorate-General for Research and Innovation, in close cooperation with the Helsinki Group on Women and Science and its statistical correspondents. It covers a wide range of themes, including the proportions of women and men among toplevel graduates, academic staff and research/advisory boards, the working conditions of women and men researchers, the integration of the gender dimension in the content of peer-reviewed scientific articles, and various indicators measuring gender gaps in scientific and innovation outputs. In *She figures*, the joint repository for these data is referred to as the Women in Science (WiS) database.

In 2012, the European Commission published the fourth *She figures*: http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf. In July 2015, preliminary findings of the *She figures 2015* report were published (the full report is due to be released at the end of 2015): https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf.

The Eurostat *Statistics on research and development* is a collection that provides data concerning R & D expenditure and R & D personnel broken down by the following institutional sectors: business enterprise (BES), government (GOV), higher education (HES) and private non-profit (PNP). It also provides the total of all sectors. All data are broken down by the sectors of performance. R & D personnel data are available in full-time equivalent (FTE), in head count (HC), as a percentage of employment, and as a percentage of the labour force. The data are further broken down by occupation, qualification, sex, size class, citizenship, age groups, fields of science, economic activity (NACE Rev. 2) and regions (NUTS 2 level). At the EU level, the sector is the basis for the calculation of the main sex-disaggregated indicators concerning R & D, in particular for the *She figures* publication and database.

<http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database>.

The Unesco Institute for Statistics (UIS) began to study STEM gender indicators in 2006. It follows an innovative methodology. In 2007, the UIS, together with Unesco's Natural Sciences Sector, published the first international report on science, technology and gender. Through its biennial survey and partnerships with other statistical organisations, the UIS collects cross-nationally comparable, gender-disaggregated statistics on research and experimental development — by sector, area of research and level of education — for more than 200 countries and territories. These data are used to support national and international policymaking to promote

gender equality in science and technology and to expand the role of women in all fields of scientific research.

<http://www.uis.unesco.org/ScienceTechnology/Pages/gender-and-science.aspx?SPSLanguage=EN>

MORE2 (funded by the European Commission, Directorate-General for Research) is a study that intends to provide 'support for continued data collection and analysis concerning mobility patterns and career paths of researchers', as provided for under the 2010 people work programme of the seventh framework programme (FP7). This foresees support for continued data collection and analysis and provides the opportunity to consolidate, improve and refine the results achieved under MORE1. Within this framework, a set of internationally comparable indicators on stocks, flows, working conditions and career paths of European researchers, as well as a database, were implemented. Indicators on the stock, employment situation and mobility of researchers in all EU countries in 2012 are presented — 'disaggregated by sex'.

http://ec.europa.eu/euraxess/pdf/research_policies/more2/Final%20report.pdf

Examples of studies, research and reports

European Commission, *Meta-analysis of gender and science research*, 2012.

This report sets out the first comprehensive view of experiences and practices in Europe and abroad relating to women and science research. Its aim is to collect and analyse research on horizontal and vertical gender segregation in research careers, as well as the underlying causes and effects of these two processes. The objectives of the study were to thus provide an exhaustive overview and analysis of research on gender and science carried out at the European, national and regional levels; to make the study results accessible to researchers and policymakers via an informed bibliography (online database) and a set of reports; and finally, to steer policymaking on gender and science and define future research priorities within the framework programme, in particular through examples of good practice and gap analysis in the various research topics.

http://ec.europa.eu/research/science-society/document_library/pdf_06/meta-analysis-of-gender-and-science-research-synthesis-report.pdf

European Commission — Directorate-General for Research, *Mapping the maze: getting more women to the top in research*, 2008.

The report presents a summary of the situation in the field of research decision making, with the aim of identifying problem areas and recommending changes.



The report does not cover all the possible sectors in which research in Europe is performed. Nevertheless, the conclusions may still apply to a wide range of sectors (institutions of higher education, public and private research institutions, membership organisations such as science academies, non-governmental/non-profit organisations and commercial enterprises).

http://ec.europa.eu/research/science-society/document_library/pdf_06/mapping-the-maze-getting-more-women-to-the-top-in-research_en.pdf.

European Commission — Directorate-General for Research, *Stocktaking 10 years of 'women in science' policy by the European Commission 1999-2009*, 2010.

This report describes and assesses the large number of projects funded by FP6 and FP7 for RTD, highlighting their contribution to two major steps: the first aimed at encouraging, preparing and adapting women to the existing research system, and the second aimed at adapting the research system to women's needs (structural change).

https://ec.europa.eu/research/science-society/document_library/pdf_06/stocktaking-10-years-of-women-in-science-book_en.pdf.

European Commission — Directorate-General for Research, *Gender research in the sixth framework programme and the first period of the seventh framework programme: socio-economic sciences and humanities programme*, 2010.

This compendium is intended to be a useful reference for anyone interested in gender research. It presents the wide range of activities carried out under the Sixth and the beginning of the seventh framework research programme in the field of socioeconomic sciences and humanities. These pursued both gender-specific research as well as the mainstreaming of gender issues in research.

https://ec.europa.eu/research/social-sciences/pdf/project_synopses/gender-research-fp6-fp7_en.pdf

European Commission — Directorate-General for Research and Innovation, *Gender equality policies in public research*, 2013.

This report is based on a survey among the members of the Helsinki Group, the European Commission's advisory group on gender, R&I. It gives a detailed analysis of the current state-of-play in terms of EU Member States' and associated countries' initiatives for promoting gender equality in R&I.

http://ec.europa.eu/research/pdf/199627_2014%202971_rtd_report.pdf

One of the first steps to take when defining your policy/project/programme is to gather information and analyse the situation of women and men in the respective policy area. The information and data you collect will allow an understanding of the reality and assist you in designing your

policy, programme or project. Specific methods that can be used in this phase are gender analysis and gender impact assessment.

Examples of gender analysis

European Commission, *Gendered innovations — how gender analysis contributes to research: report of the expert group 'Innovation through gender'*, 2013.

This publication includes case studies as concrete illustrations of how gender analysis leads to new ideas and excellence in research in several fields such as health and medicine, environment and climate change, food and nutrition, transport and technological development.

http://ec.europa.eu/newsroom/horizon2020/document.cfm?doc_id=3853

Schiebinger, L., Klinge, I., Arlow, A. and Newman, S., 'Introduction', in L. Schiebinger and I. Klinge (eds.), *Gendered Innovations: Mainstreaming Sex and Gender Analysis into Basic and Applied Research: Meta-Analysis of Gender and Science Research — Topic Report*, 2010.

This text presents the main steps to be followed when performing gender analysis in the research sector.

https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/meta-analysis-of-gender-and-science-research-synthesis-report.pdf

An example of gender impact assessment

European Commission — Directorate-General for Research/ Science and Society/C.5 Women and Science, *Gender in research: gender impact assessment of the specific programmes of the fifth framework programme*, 2005.

This report presents a synthesis of the key findings and recommendations of seven studies carried out as part of the gender impact assessment exercise, launched by the European Commission in June 2000, with a view to assessing the way in which gender issues are being addressed within FP5. It entails specific recommendations for mainstreaming gender in the framework programme implementation cycle and research areas.

ftp://ftp.cordis.europa.eu/pub/science-society/docs/women_gender_impact_fp5_en.pdf

Examples of stakeholders that can be consulted

European Platform of Women Scientists

The European Platform of Women Scientists (EPWS) is an umbrella organisation bringing together networks of women scientists and organisations committed to gender equality in research in all disciplines in Europe and the countries associated with the EU's framework programmes for RTD. The platform welcomes researchers working in any discipline and working in science in its widest sense, ranging from the natural to the social sciences, and including, but not restricted to, science, engineering and technology. The EPWS currently includes more than 100 member organisations and represents more than 12 000 women researchers all over Europe who are active in academia and industrial research.

<http://www.epws.org>

GenderSTE

This is a COST-funded network for the promotion of gender equality in R&I. It organises awareness-raising events across Europe.

<http://www.genderste.eu>

GenPORT

GenPORT is a developing online community of practitioners, served by an internet portal and made up of organisations and individuals working across the globe for gender equality and excellence in science, technology or innovation.

<http://www.genderportal.eu>

Plan

DEFINE PLAN ACT CHECK

In this phase, it is appropriate to analyse budgets from a gender perspective. Gender budgeting is used to identify how budget allocations contribute to promoting gender equality. Gender budgeting brings visibility to how much public money is spent on women and men respectively. Thus, gender budgeting thus ensures that public funds are fairly distributed between women and men. It also contributes to accountability and transparency about how public funds are being spent.

Example of gender budgeting in research

The Women's Academy Munich regulation association (FAM Frauenakademie München) undertook a project, *Gender budgeting as an instrument for managing scientific organisations to promote equal opportunities for women and men — with the example of universities*, in 2007. This is a transnational EU project (carried out in Germany, Austria and Poland), showing which dimensions and which phases of the budgeting process have to be considered. It provides basic steps for systematically integrating gender issues into the budgeting process in research and scientific organisations. <http://frauenakademie.de/en/research/gender-budgeting>

Examples of indicators for monitoring gender and research

Share of women researchers, by sectors of performance

This indicator is calculated as the percentage of women researchers out of the total number of researchers. It can be calculated as a percentage of the total researchers in all sectors or disaggregated by sector (BES, GOV, HES, PNP). This indicator provides a means of measuring gender imbalances in research. The indicator is available in HC, i.e. people employed, and in FTEs.

The latest figures are from 2011, when 33 % of researchers in all sectors were women. The indicator is available from Eurostat's Statistics on research and development — R & D personnel at the national and regional levels (online data code: *rd_p_femres*).

http://ec.europa.eu/eurostat/data/database?node_code=rd_p_femres

Proportion of women researchers in the sectors of performance, by fields of science

This indicator is calculated as the percentage of women researchers out of the total researchers in each sector of performance (BES, GOV, HES, PNP) and in different field of sciences (natural sciences, engineering and technology, medical and health sciences, agricultural sciences, social sciences and humanities). The indicators provide a means of measuring gender imbalances in the field of research. The indicators can be calculated using the number of women and total HC, derived from Eurostat Statistics on research and development — R & D personnel at the national and regional levels (online data code: *rd_p_perssci*).

http://ec.europa.eu/eurostat/data/database?node_code=rd_p_perssci



Proportion of women in a grade A academic position

This indicator is calculated as a percentage of women in a grade A academic position out of the total members of academic staff at grade A. Grade A is the single highest grade/post at which a researcher is normally employed. The statistics on the seniority of academic staff are collected at the national level through higher education and R & D surveys or directly from higher education institutions as part of their own monitoring systems and administrative records.

This indicator is included in the set of indicators for monitoring Area B of the BPfA — 'Education and training of women' ⁽⁴⁹⁾. Data are available from the WiS database, which was implemented for the realisation of *She figures* reports by the Directorate-General for Research and Innovation and is updated triennially with every new edition of the *She figures*. The latest available data are from 2010 and show that women represent only 20 % of academic staff at grade A.
http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf
https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf

Examples of procurement

European Commission, *The gender challenge in research funding: assessing the European national scenes*, 2009.

This report focuses on research funding across Europe, mainly but not exclusively from a gender perspective. It is the result of the work of an EU expert group set up by the European Commission to provide 'recommendations on the improvement of transparency and accountability of procedures used in selection committees for grants and fellowship awards, and access to research funding in general'. The report analyses the gender dynamics among applicants, recipients and gatekeepers of research funding, in funding processes, instruments and criteria, and the role of key funding organisations in promoting gender equality in research. An overview of the national situations in terms of research landscape and gender settings is annexed to the report.

http://ec.europa.eu/research/science-society/document_library/pdf_06/the-gender-challenge-in-research-funding-report_en.pdf

⁽⁴⁹⁾ EIGE, *Women and men in the EU — facts and figures. Area B: education and training of women*, <http://eige.europa.eu/gender-statistics/women-and-men-in-the-eu-facts-and-figures/area/22/indicator/64>.

Act

DEFINE PLAN **ACT** CHECK

In the implementation phase of a policy or programme, ensure that all those involved are sufficiently aware about the relevant gender objectives and plans. If not, set up briefings and capacity-building initiatives according to staff needs. Think about researchers, proposal evaluators, monitoring and evaluation experts, scientific officers, programme committee members, etc.

Example of capacity-building initiatives on gender and research

Gender in EU-funded research is a training programme that was financed under FP7 by the European Commission, delivering 73 1-day training sessions across the EU on 'gender in EU-funded research'. A toolkit and training activities are available on the website.

<http://www.yellowwindow.be/genderinresearch/>

The Association of Commonwealth Universities has prepared a training module, *Introduction to gender mainstreaming universities*, which presents several activities/exercises to mainstream gender within universities. A specific chapter is dedicated to *Methods of mainstreaming gender into the academic curriculum/discipline/department*.

<https://www.acu.ac.uk/membership/gender-programme/intro-gender-mainstreaming-universities>

Practising gender equality in science, guidelines for gender equality programmes in science, 2009, is based on the collation and assessment of practices developed in Europe, North America and Australia. These guidelines aim to best exploit the available theoretical and practical knowledge on how to promote gender equality in science and technology. The guidelines are intended to be useful to universities, research centres and other stakeholders in terms of implementing institutional and cultural change in favour of greater inclusivity for women scientists and improving working conditions for women (and men) on their premises.

http://www.genderportal.eu/sites/default/files/resource_pool/prages-guidelines_en.pdf

Example of gender language in research

Husu, L. and Tainio, L., 'Representations of women scientists in Finnish print media: Top researchers, multi-talents and experts', in L. Mattfolk, S. Nordlund-Laurent and J.O. Ostman, (eds.), *Language, politeness, and gender*, Nordica Helsingia, University of Helsinki, Helsinki, 2007.

The use of language and concepts can determine the direction of scientific practice, the questions asked, the results obtained and the interpretations of those results. This study points to the use of language in programme materials and how this can constitute and create gender bias, or simply fail to take account of gender differences.

Check

DEFINE PLAN ACT CHECK

A policy cycle or programme should be checked both during — monitoring, and at the end — evaluation, of its implementation.

Monitoring ongoing work allows those involved to follow up progress and for remedying unforeseen difficulties. This process should take into account the indicators set out in the planning phase and data collection based on those indicators.

At the end of a policy cycle or programme, a gender-sensitive evaluation should take place. Make your evaluation publicly accessible and strategically disseminate its results to promote its learning potential.

Examples of monitoring and evaluating gender in research

European Commission — Directorate-General for Research and Innovation, *Indicators for promoting and monitoring responsible research and innovation: report from the expert group on policy indicators for responsible research and innovation*, 2015.

Early in 2014, the European Commission appointed an expert group 'to identify and propose indicators and other effective means to monitor and assess the impacts of responsible research and innovation (RRI) initiatives, and evaluate their performance in relation to general and specific RRI objectives'. This report presents the results of the work of the expert group. It contains three parts: first, a conceptual introduction of RRI; second, a detailed review of possible indicators in eight key areas for RRI policy; and third, a number of concrete proposals for indicator design and implementation. One of the eight key areas is gender equality.

http://ec.europa.eu/research/swafs/pdf/pub_rri/rri_indicators_final_version.pdf

European Commission — Directorate-General for Research, *Monitoring progress towards gender equality in the sixth framework programme — synthesis report*, 2009.

This report presents a synthesis of six gender monitoring studies carried out by research teams representing universities, research institutes and organisations specialising in

gender research. The studies were commissioned by the European Commission to monitor advancement towards gender equality, both at project and programme level.

http://ec.europa.eu/research/science-society/document_library/pdf_06/gender-monitoring-studies-synthesis-report_en.pdf

Practical examples of gender mainstreaming in research

France

At the University of Strasbourg, the Equality Diversity Office (Mission Égalités-Diversité) is directly linked with the university's vice-president. The office interacts with the governing board, the board of trustees, the university's services and faculties so as to analyse given gender issues and to introduce gender action plans for teaching and research staff, as well as administrative and technical staff. In addition to the office's interactions with the university leadership and board of trustees, university staff can directly submit a case of gender inequality to the Equality Diversity Office, which can lead to a change in the university's regulations decided by the board of trustees.

Germany

In 2008, the Rectorate of the University of Freiburg declared equal opportunity and diversity as central strategic tasks for the university. This resulted in (1) a new governance structure that integrates all relevant strategic and operational actors and units, (2) internal and external strategic and data benchmarking, (3) the optimisation and diversification of working conditions and support services in order to increase competitiveness, and (4) the establishment of transparent, structured and formalised procedures. These measures are based on the Research-Oriented Equal Opportunity Standards of the German Research Foundation. The 2011 progress report on their implementation can be found at:

<http://www.gleichstellung.uni-freiburg.de/dokumente/dfg-progress-report-2011-en.pdf>

Ireland

The Irish Research Council (IRC) has recently published its gender strategy and action plan (2013-2020). It aims to strengthen women's participation in research and integrate the sex/gender dimension into research content by a combination of initiatives and measures.



Requirements for grant applicants and beneficiaries are combined with guidance and training initiatives for a variety of target audiences (researchers, application reviewers and staff of the IRC). The plan also includes the showcasing of success stories and role models, the inclusion of the gender dimension in the monitoring and review processes applied by the IRC, the review of internal processes and procedures within the IRC, etc.

http://www.research.ie/sites/default/files/irish_research_council_gender_action_plan_2013_-2020.pdf

Italy

In 2012, the Italian Department for Equal Opportunities and the Presidency of the Council of Ministers began implementing the project Structural Transformation to Achieve Gender Equality in Science (Stages). The project has been designed with the general aim of increasing the participation and career advancement of women researchers. It launches structural change strategies and addresses the multidimensional nature of gender and science issues with a wide perspective and scope. It closely involves human resource management in research institutions, modifying and gendering its basic tenets.

<http://www.projectstages.it/index.php/en/>

The University of Milan has been awarded an EU-funded FP7 project as part of the implementation of the Stages project. Since 2012, five research institutes and universities from Denmark, Germany, Italy, the Netherlands and Romania have each implemented a self-tailored action plan. These plans include activities such as:

- awareness-raising initiatives in high-level institutional bodies;
- training modules on gender equality for internal decision makers;
- mentoring programmes for young women scientists;
- actions to enhance the visibility of women scientists;

- updated management and research assessment standards;
- course content development;
- leadership development;
- work-life balance measures;
- gender quotas in committees;
- promotion and retention policies.

<http://www.rri-tools.eu/-/stages-structural-transformation-to-achieve-gender-equality-in-science>

Switzerland

At Zurich University, a 'protected time' programme is available on a competitive basis for post-docs, for a duration of up to 6 months. Originally introduced for women post-docs by the Office for Gender Equality, the measure has been integrated into the general strategy for promoting and supporting young researchers. The programme funding is used to finance a substitute researcher at the grantee's institute. The grantee's university salary continues unchanged during the protected time period.

http://www.researchers.uzh.ch/promotion/forschungskredit/postdoc_en.html

Norway

The initiative on gender balance in senior positions and research management (Balanse) seeks to promote gender balance at the senior level of Norwegian research through new knowledge, learning and innovative measures. The Balanse initiative is funded by the Ministry of Education and Research, and the start-up phase was launched in 2013. The initiative will run for a minimum of 10 years and plans call for an overall budget of approximately NOK 118 million.

<http://www.rri-tools.eu/-/stages-structural-transformation-to-achieve-gender-equality-in-science>

5. Want to know more?

Timeline

The key milestones of the EU research policy are presented below.



(1) The group's mandate includes reflecting on and advising the Commission about the development of initiatives within the different policies and frameworks related to science, R&I, with a view to enhancing gender equality in R&I, including work-life balance issues; integrating the gender dimension in research content and programmes; modernising research institutions; mobilising stakeholders in order to promote gender equality; and facilitating the development of the gender priority in the ERA.

6. Current policy priorities at the EU level

The overarching policy priorities of the EU policy for research are clearly identified in the European Commission's 2012 policy communication on the ERA, which should lead to a significant improvement in Europe's research performance to promote growth and job creation. In particular, the measures in the communication will have to be implemented by EU Member States, the Commission and research organisations. The key priorities can be summarised as follows:

- more effective national research systems;
- optimal transnational cooperation and competition on common research agendas, major challenges and infrastructures;
- an open labour market for researchers to facilitate mobility, support training and ensure attractive careers;
- gender equality and gender mainstreaming in research, encouraging gender diversity to foster excellence and relevance in science;
- optimal circulation and transfer of scientific knowledge to guarantee access to and uptake of knowledge by all.

European research, and more specifically the creation of an ERA — a unified area open to the world, in which scientific knowledge, technology and researchers circulate freely — is now high on the policy agenda in Europe. Conducting European research policies and implementing European research programmes is in the first instance a legal and political obligation resulting from the Treaty of Amsterdam. The treaty does in fact include a whole chapter on RTD, so as to underline that RTD is an essential element in the functioning of industrialised countries such as EU Member States.

Recently (December 2015), the Council of the European Union has deliberated conclusions on the importance of advancing gender equality in the ERA, identifying those policy measures and actions that should be promoted at both European and national levels.

Horizon 2020 is the biggest EU R&I programme ever. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market, in order to boost economic growth and create jobs. This framework programme, running from 2014 to 2020, puts an emphasis on three key priorities: excellent science, industrial leadership and societal challenges. By coupling R&I, Horizon 2020 is helping to achieve economic growth and job creation through these three priorities. The goal is to ensure Europe produces world-class science, removes barriers to

innovation and makes it easier for the public and private sectors to work together in delivering innovation.

Resources

Selected policy documents relevant to research

Council Decision of 3 December 2013 establishing the specific programme implementing Horizon 2020 — the framework programme for research and innovation (2014-2020). http://ec.europa.eu/research/participants/data/ref/h2020/legal_basis/sp/h2020-sp_en.pdf.

European Commission (2013), Horizon 2020: work programme 2014-2015: science with and for society. http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-swfs_en.pdf#14.

European Commission (2011), Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions 'Horizon 2020 –the framework programme for research and innovation'. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0808:FIN:EN:PDF>.

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Policy documents relevant to gender equality

Council resolution of 20 May 1999 on women and science (1999/C 201/01). https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/council-resolution-may-1999_en.pdf.

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https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/g_wo_co_en.pdf.

United Nations Commission on the Status of Women, *Access and participation of women and girls in education, training, science and technology, including for the promotion of women's equal access to full employment and decent work: report of the Secretary-General* (E/CN.6/2011/3), 2011.

http://www.un.org/ga/search/view_doc.asp?symbol=E/CN.6/2011/3.

Selected studies on gender issues in research

Berryman, S., *Who will do science? Trends, and their causes in minority and female representation among holders of advanced degrees in science and mathematics*, 1983, Rockefeller Foundation, New York, <http://eric.ed.gov/?id=ED245052>.

Blockenstaff, J., 'Women and science careers: Leaky pipeline or gender filter?', *Gender and Education*, Vol. 17, No 4, pp. 369-386, 2005.

<http://www.tandfonline.com/doi/abs/10.1080/09540250500145072>.

European Commission, *Meta-analysis of gender and science research*, 2012.

http://ec.europa.eu/research/science-society/document_library/pdf_06/meta-analysis-of-gender-and-science-research-synthesis-report.pdf.

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https://ec.europa.eu/research/social-sciences/pdf/project_synopses/gender-research-fp6-fp7_en.pdf.

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http://ec.europa.eu/research/science-society/document_library/pdf_06/gender-challenge-in-research-funding_en.pdf.

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http://ec.europa.eu/research/science-society/document_library/pdf_06/gender-equality-report-fp6-final_en.pdf.

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http://ec.europa.eu/research/science-society/document_library/pdf_06/sis-gender-projects_en.pdf.

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Wenneras, C. and Wold, A., 'Nepotism and sexism in peer-review', *Nature*, Vol. 387, No 22 (6631), 1997, pp. 341-343.

Other resources

European Commission, *Structural change in research institutions: enhancing excellence, gender equality and efficiency in research and innovation*, 2011.

This report from the Expert Group on Structural Change set up by the EC contains key recommendations for actions by the European Commission, European-wide organisations, Member States, R&I funding bodies, journal editorial boards, universities and scientific institutions. http://ec.europa.eu/research/science-society/document_library/pdf_06/structural-changes-final-report_en.pdf

European Commission, *Remuneration of researchers in the public and private sectors*, 2007.

The study collected information on the gross and net remunerations of researchers in the public and private commercial sectors. It was the first attempt to gain insight into the profession of researchers. The study also discusses researchers' career recognition.

http://ec.europa.eu/euraxess/pdf/research_policies/final_report.pdf

European Commission, *The European charter for researchers: the code of conduct for the recruitment of researchers*, 2005. http://ec.europa.eu/euraxess/pdf/brochure_rights/am509774CEE_EN_E4.pdf

European Commission, *Fact sheet: gender equality in Horizon 2020*

This fact sheet explains the three key objectives of this framework programme.

https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/FactSheet_Gender_2.pdf

The European Commission's *e-library on gender equality in research*.

<http://ec.europa.eu/research/swafs/index.cfm?lg=en&pg=library>

Gender in research toolkit

Lessons learned from the monitoring studies conducted during FP6 showed that the integration of gender aspects into research content was hampered in two ways: the concept was not well understood, and this lack of clarity meant it was sometimes difficult to identify practical ways to address the gender dimension in research. To address this problem, a *Gender in research toolkit* was developed under FP7 to build gender capacity within the scientific research community. The toolkit comprises a module introducing the subject, as well as nine separate modules dedicated to specific scientific fields, and a checklist.

<http://www.yellowwindow.be/en/home>

Gendered Innovations website

This website suggests practical methods of sex and gender analysis for scientists and engineers, and provides case studies as concrete illustrations of how sex and gender analysis leads to innovation.

<https://genderedinnovations.stanford.edu/>

Gender stereotypes and gender attitudes in the assessment of women's work

These genSET briefing documents include suggestions for practical action and references for further reading on specific topics: advancing excellence in science through gender equality; gender stereotypes and gendered attitudes in the assessment of women's work; and gender-fair recruitment and retention strategies.

<http://www.genderinscience.org/index.php/consensus-seminars/seminar-briefing-documents>

Guidelines for gender equality programmes in science

These guidelines are the result of the 21-month Prages project, which aimed to address the under-representation of women in high-profile positions in scientific and technological research. The 200+ page publication provides a range of information, including strategies and recommendations for change.

https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/prages-guidelines_en.pdf

Gender Balance in Research — Norway

An online information source for people who work to improve gender balance in the research sector, and for anyone interested in the issue of gender equality in science.

<http://genderedinnovations.stanford.edu/Norway2014Policy.pdf>

The gender challenge in research funding

The Gender and Excellence Expert Group (comprising 16 specialists) was established by the European Commission to provide recommendations on ways to improve transparency in the procedures used in research funding, particularly regarding the gender challenge in funding across Europe. The report details the group's analysis of the gender dynamics among applicants, recipients and gatekeepers involved in research funding, processes, instruments and criteria in 33 countries (27 EU Member States and six associated countries).

http://ec.europa.eu/research/science-society/document_library/pdf_06/the-gender-challenge-in-research-funding-report_en.pdf

GenPORT

An online portal on gender (in) research and for gender in the science community. It aims to become the single point from which to browse, search and access the highest-quality resources on gender and science issues and to offer support for users who seek advice and who want to advance their understanding of gender issues in science.

<http://www.genderportal.eu/>

The *Horizon 2020 online manual* has a specific page on gender.

Talent at stake: Changing the culture of research – Gender-sensitive leadership

This is a booklet developed by the Committee for Gender Balance in Research (Norway). It aims to be a source of inspiration for anyone who wants to do something to increase diversity and promote greater gender balance within the research sector.

http://www.amit-es.org/assets/files/publi/norwegian_minister_research_2010.pdf

Other organisations and institutions

Directorate-General for Research and Innovation: Unit B.7 *Science for and in Society* (sector B.7.2 'Gender')

Section head: Ms Viviane Willis Mazzichi.

Email: rtd-womenscience@ec.europa.eu.

ATGENDER: The European Association for Gender Research, Education and Documentation, a professional organisation in the field of international gender studies.

<http://atgender.eu/>

GenderSTE

GenderSTE is a policy-driven targeted network funded by COST and set up to advance state-of-the-art knowledge and policy implementation on gender, science, technology and engineering. It does this by creating a network of policymakers and experts on gender, science and technology. These networking activities bring together researchers and decision makers on issues related to gender in R&I.

<http://www.genderste.eu/>



<http://eige.europa.eu>

