

Talent to the Top

Still a challenge for women in engineering?

Maria Siebes, PhD

Women in MBE committee, IFMBE

Dept. of Biomedical Engineering & Physics



Academic Medical Center, Univ. of Amsterdam, The Netherlands

Who's the scientist?

1873: Based on research it was concluded:
"Higher education will cause women's uteruses to become atrophied."

2005: Based on research it was concluded:
"Girls and boys behave differently because their brains are wired differently."



Seventh graders describe scientists before and after a visit to Fermilab.

Our findings on women and STEM are not communicated effectively in ways that allow the public to understand and evaluate these findings and, where appropriate, make decisions based on them.

EU targets by 2010



- ▶ Europe aims to become the leading knowledge-based society (Lisbon Summit, 2000)
- ▶ 3% investment of GDP in R&D (Barcelona, 2002)
- ▶ Europe needs 700,000 more researchers. In order to sustain the EU's research capacity, intellectual resources need to be drawn from those with appropriate abilities and attainment on a more equitable basis than they are at present:
 - 40% participation of women in high-level decision-making groups and research panels (EU Council resolution, 2000)
 - 25% female full professors
 - Double the number of female researchers in industry
 - 1/3 women for all engineering graduates



Actions in FP7

EDUCATION AND TRAINING 2010

- ▶ Objectives of 'Gender and Research' activities under the key area 'Science in Society' (DG Research):
 - strengthening the role of women in scientific research and in scientific decision-making bodies;
 - gender dimension of research;
 - mainstreaming gender in Community research policy and programs.

- ▶ Gender mainstreaming = integrating equality between women and men into all policies and activities; Top-down approach
 - Gender awareness training in research institutions, including changing the working culture
 - Gender mechanisms in the scientific world, including career development perspectives, pay gaps, mobility of researchers, work-life balance measures
 - Equal access to scientific studies and the scientific job market, including the promotion of women in science and technology.
 - Top-level commitment to gender equality, starting at EU level and followed by measures in research councils and universities. (*Source: Women In Research Decision Making (WIRDEM) Report 2007*)

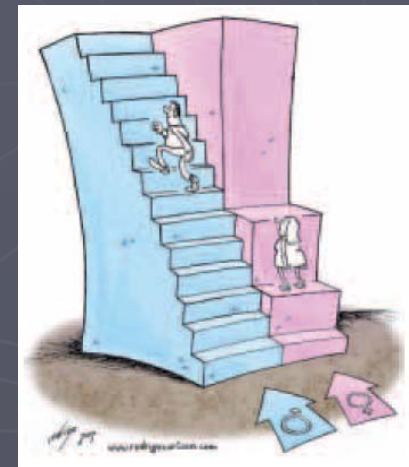
- EU Platform of Women Scientists launched in 2005 (network of women scientists and organizations committed to gender equality in scientific research. (www.epws.org))

- ▶ EU Institute for Gender Equality established in 2006 (budget 52.5 million, 2007-2013)

http://ec.europa.eu/education/policies/2010/objectives_en.html

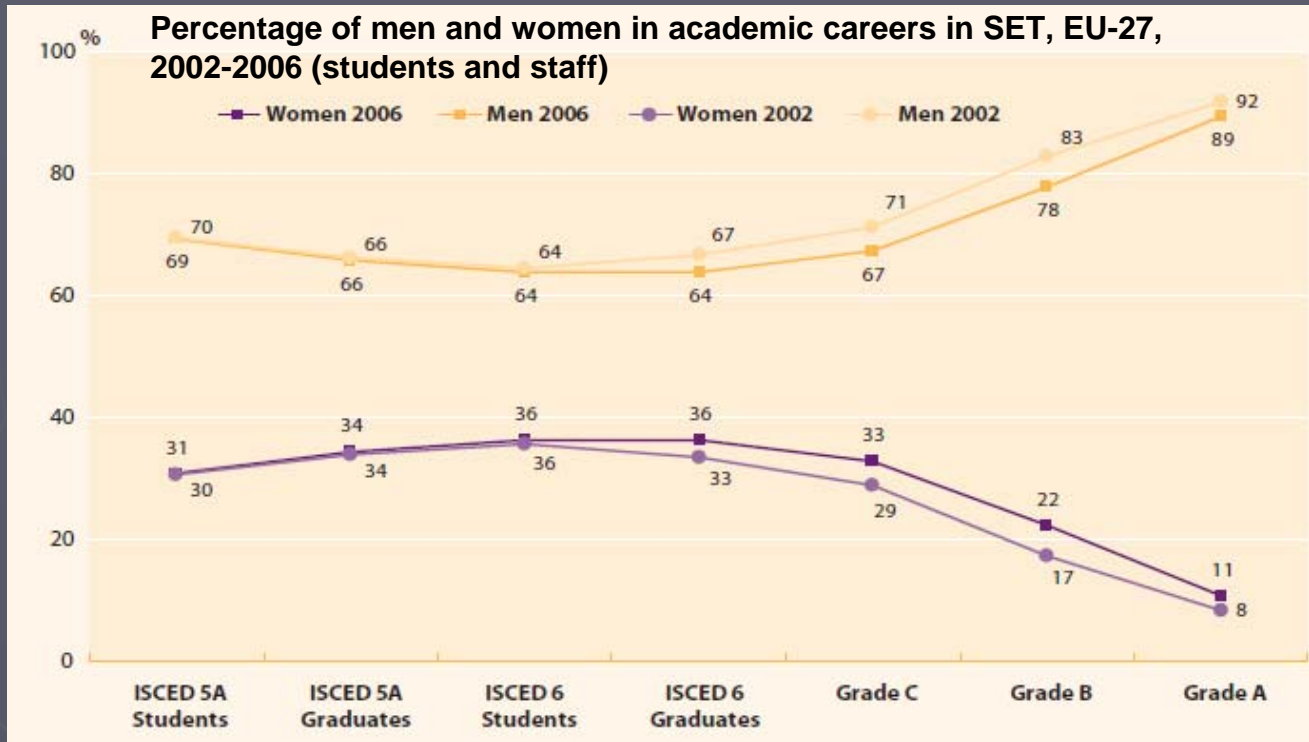
EU Reality for Women in SET

- ▶ Gender imbalance remains in EU-27: Only 30% of researchers are women
- ▶ Career marked by strong and persistent vertical segregation:
 - Academic staff in SET: 33% grade C, 22% grade B, 11% grade A (full professors);
- ▶ Women have disproportionately lower chance of holding positions of influence, e.g. through membership in scientific boards (22%)
 - poorer access to R&D resources and lower pay
 - Men are twice more likely to reach top level positions in research
 - General lack of awareness and commitment
- ▶ No spontaneous self-correcting trend to equality, unequal situation prevails



Source: "She Figures 2009", DG Research, Science and Society - Women and Science

Leaky Pipeline



Source: *She Figures 2009, EU Commission*

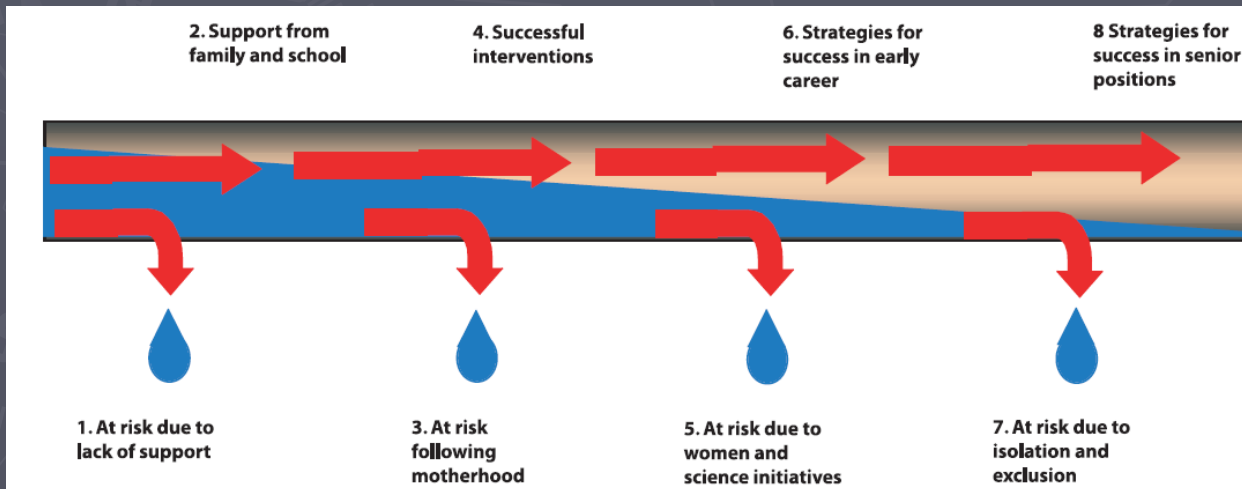
includes Natural sciences, E&T

E&T = 7.2%

Nat. sci = 13.4%

Agricul. = 16.8%

Med. Sci. = 17%



intervention

risk

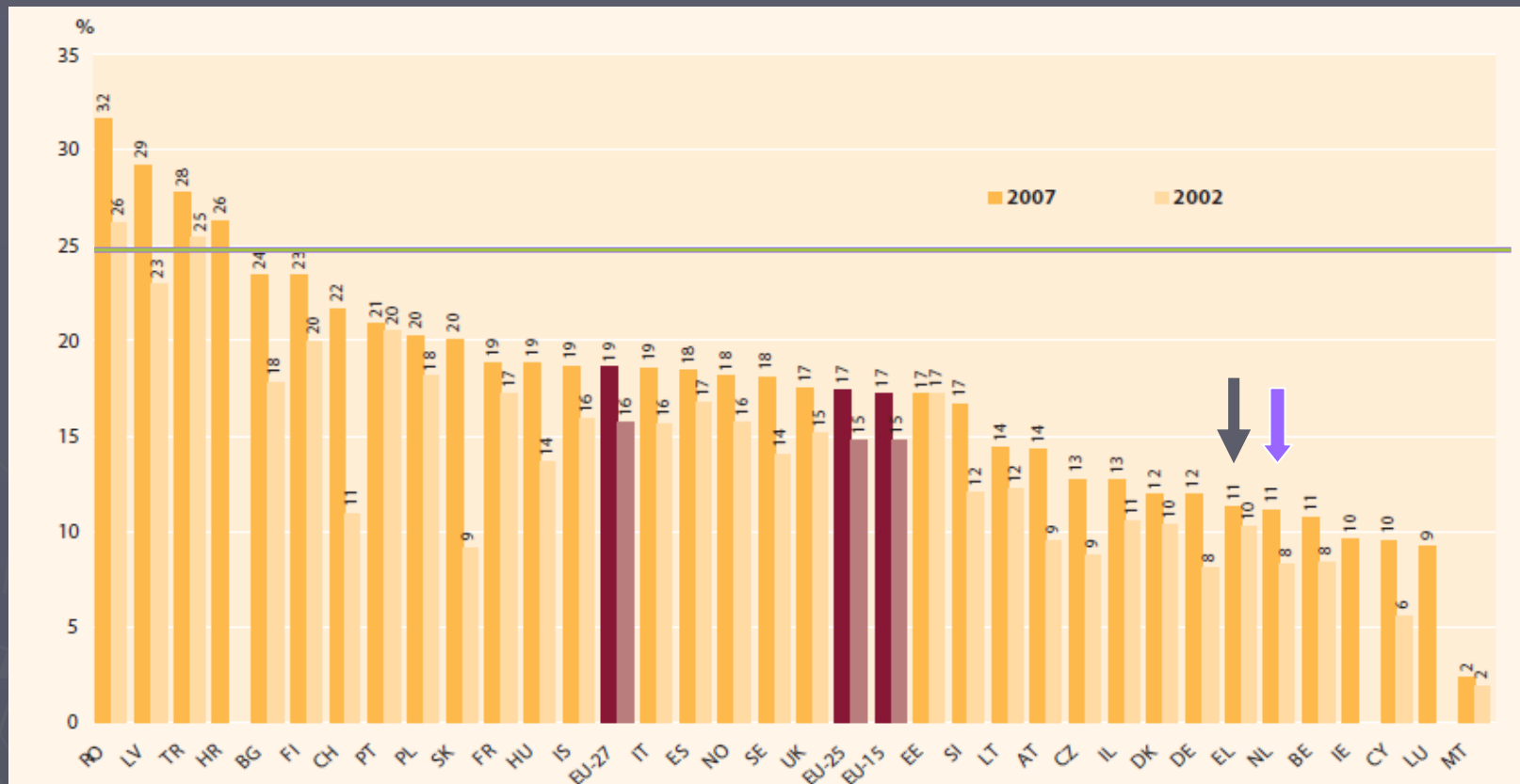
Source: *Women in Science and Technology – The Business Perspective, EU 2006*

Percentage of Female Research Scientists & Engineers by sector (2006)



37% in HES, 39% in GOV, 19% in BES, lowest share in E+T

Proportion of Women Full professors



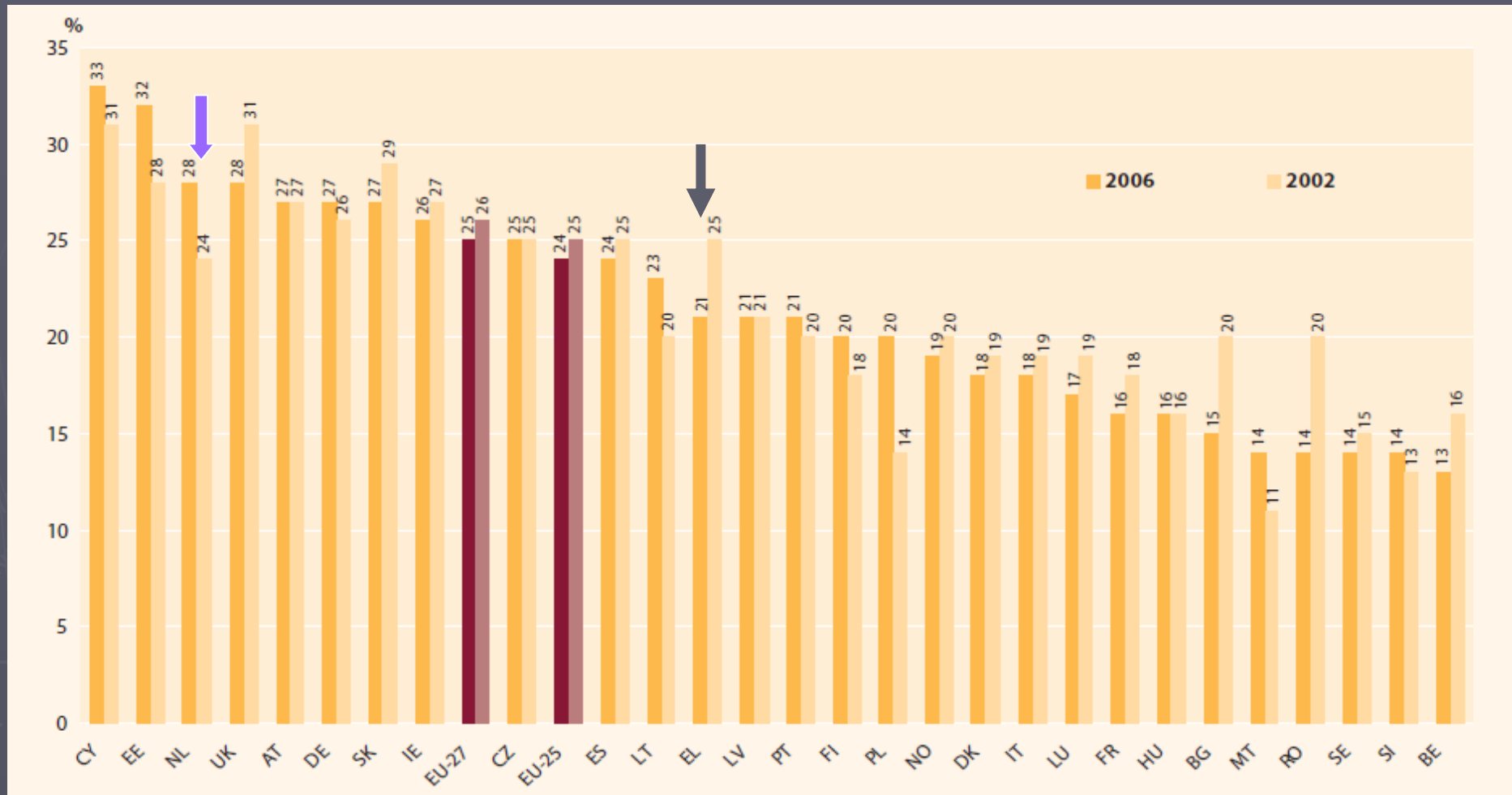
It seems unlikely that the 25 countries who have not yet reached 20% of women full professors will reach the 25% target recommended by European Commission by 2010

Grade A women in SET: 11%

In EU-27: 23% 35-44 yrs, 21% 45-54 yrs, 18% > 55 yrs – getting better??

Treaty of Rome 1957: Equal pay for equal work.

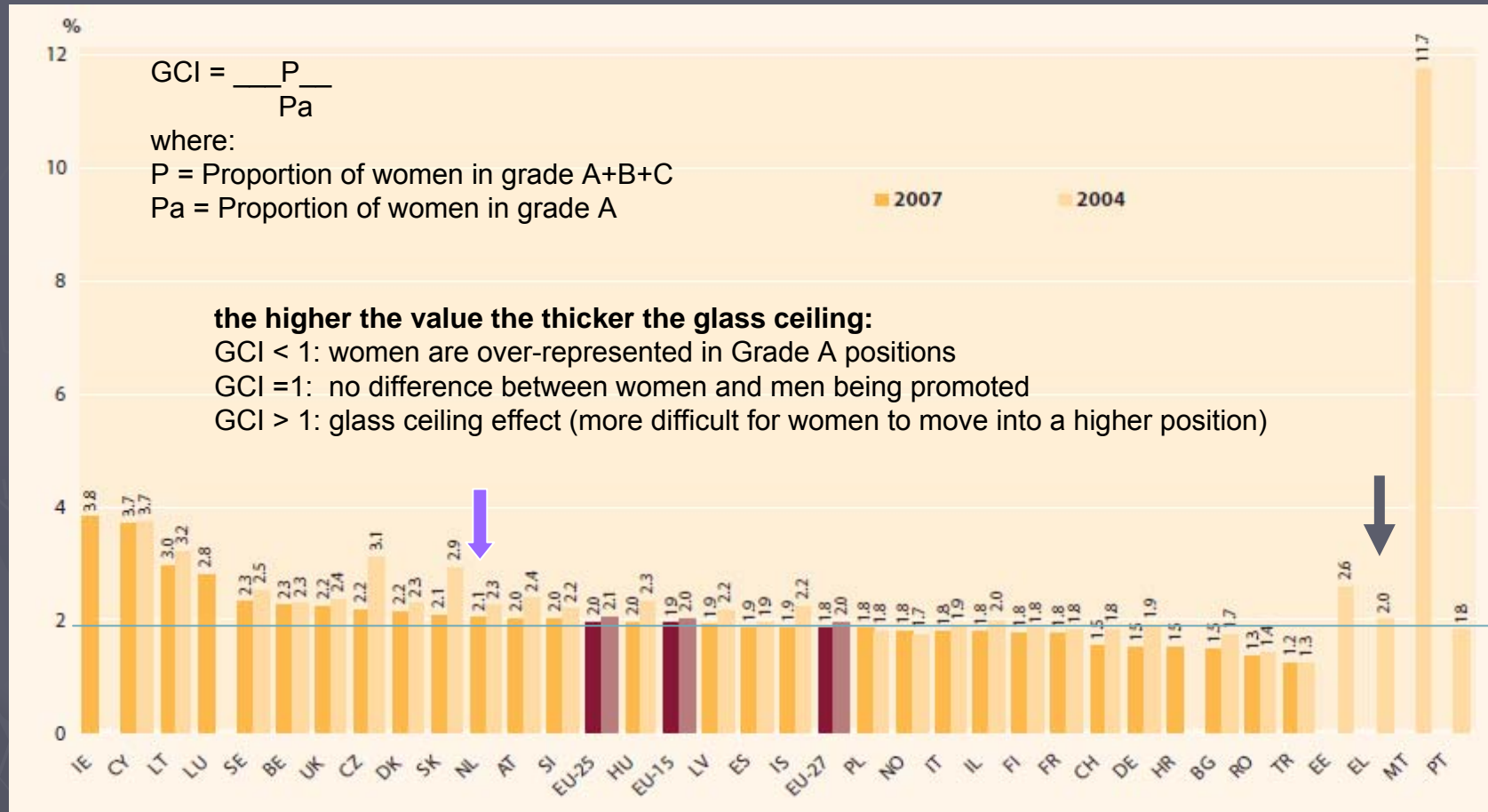
Gender pay gap in % for total economy 2002/2006



Overall: 25% (was 26% in 2002); SET professionals: 34% in 2002, 31% in 2006

38% for age 45-54, 37% for age 55-64, 28% for age 35-44, 17% for age 15-34

Glass ceiling index 2004/2007



Relative chance for women of reaching a top position. 1 = no difference
 EU-27 in 2007: avg = 1.8

She Figures 2009

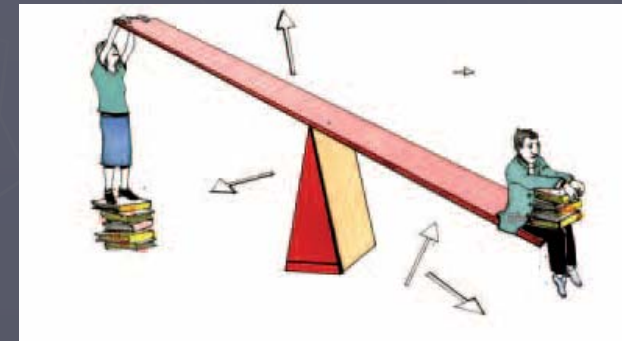
Gender imbalance is highly relevant for EU economy.

- ▶ Proactive policies are essential. Diversity is factor of higher chances for excellence.
- ▶ Gender-mixed composition of boards and nominating commissions; increased objectivity of applied selection criteria, tutoring, fixing quotas;
- ▶ fight against gender stereotypes; promote gender mix (mainstreaming)

Leveling the playing field

► Top concerns affecting a woman's engineering career

- Marginalization and isolation
- Having to prove herself at the workplace
- Recognition for achievements
- Getting work (research) opportunities
- Lack of transparency in decision-making
- Work-life balance
- Sexual harassment and 'jokes'

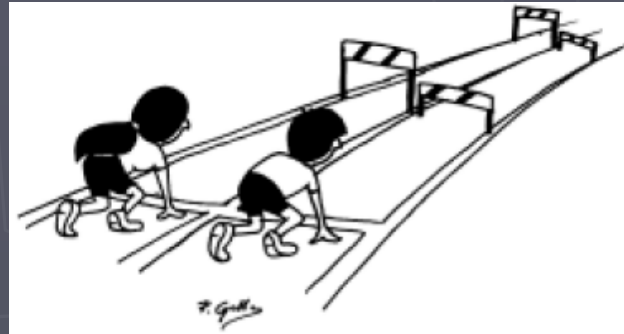


► Interventions must be aimed at changing culture

- Change the image of science and scientists
- Raise awareness ('There is no problem')
- Combat denial and prejudice ('Science is neutral, objective, and bias-free')
- Top-down gender mainstreaming ('fix the administration not the women')
- Inertia and stereotypes: turn laws and regulations into mere text, commitment into simple lip service and measures into window-dressing
- Don't quit. ('Half of potential human knowledge is in female heads')

Men need to get involved

- ▶ appoint men as diversity dedicated 'agents', i.e., people who are advocates for women leaders and whose actions and attitudes can influence those of *their peers*.
- ▶ People are more likely to change their stereotypic beliefs when these are not shared by people they identify with.
- ▶ In other words, 'one of the boys' may have good chances of influencing gender diversity positively, as they are perceived as not having self-vested interests in the cause.



Source: "WOMEN IN IN SCIENCE AND TECHNOLOGY - THE BUSINESS PERSPECTIVE"
DG Research, Science and Society - Women and Science, 2006, EUR 22065 EN
http://europa.eu.int/comm/research/rtdinfo/index_en.html

THOSE WHO SAY
IT CANNOT
BE DONE



should
NOT

INTERRUPT
THE woman
doing
IT.

CHINESE PROVERB
NOT

Why are fewer women at the top?



5 major problems:

- ▶ women less likely to be promoted to top positions
- ▶ low proportion of women on research decision-making boards. members of research councils – the 'gate-keepers' are usually senior academics, and those are usually male.
- ▶ women researchers are paid less than men on the same level (gender pay-gap)
- ▶ the more money spent on R&D the fewer women – association with status of research jobs?
- ▶ 'There is no problem' – lack of awareness and commitment. Counteract by top-level commitment to gender equality, starting at the EU level and followed by measures in research councils and universities. institutions.

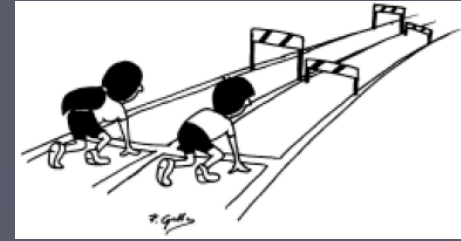
International rankings of universities is mainly determined by the numbers of publications, numbers of patents, post-doctoral fellows, etc, but not by gender equality.

Source: Women In Research Decision Making (WIRDEM) Report 2007

Good practice and measures

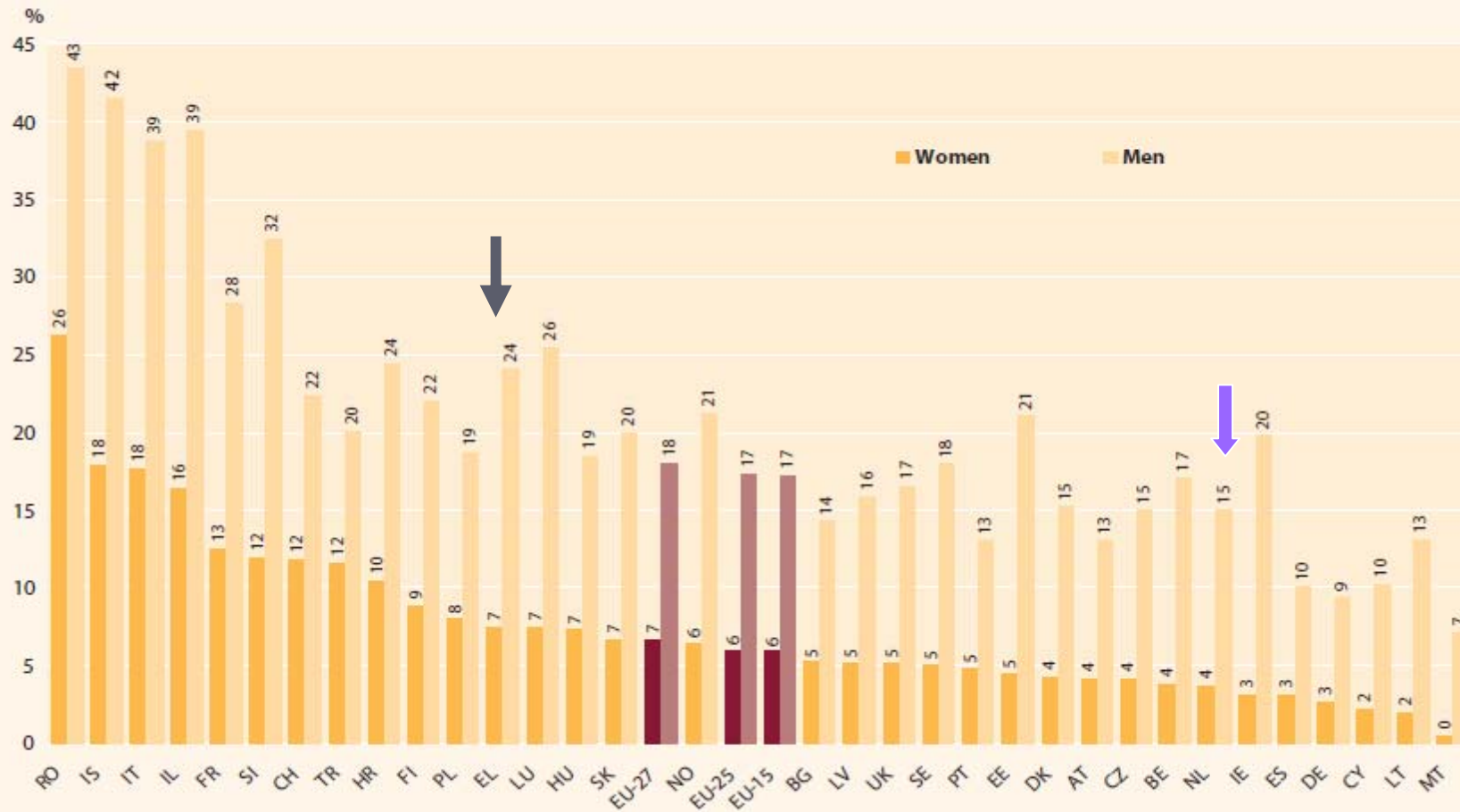
- ▶ **Follow the money:** promote gender equality in decision-making
 - Gender balance on decision-making bodies
 - Special programs for women in funding
 - Gender budgeting (lion share of university's budget is bound to personnel)
- ▶ **Getting women to the top:** promote gender equality in decision-making for appointments
 - Transparent procedures (from language in ads to proactive searches, gender balance in selection procedure,, gender expertise on selection boards)
 - Targets and quotas (unpopular, but stricter in nature)
 - Hiring incentives, support for female staff & mentoring programs
 - Mentoring and empowerment
(*EU Network of Mentoring Programmes, eument-net; EU Platform of Women Scientists, epws*)
 - Work-life balance (importance of 'academic age')
- ▶ **Good research practices to benefit women – and men:** promote gender equality as part of quality management -
 - transparency, clarity and accessibility
 - target agreements, equality plans with quantifiable goals and indicators for success
 - leadership must be positive regarding gender equality – both in word and deed
 - staff of an institution need to be sensitized
- ▶ **Changing policy (Top-down approach):** promote gender equality as policy goal in science
 - Good policy in research means considering the effect of gender on efficiency and scientific excellence
 - Establish Women and Science units in the ministries responsible for research

We need Change!



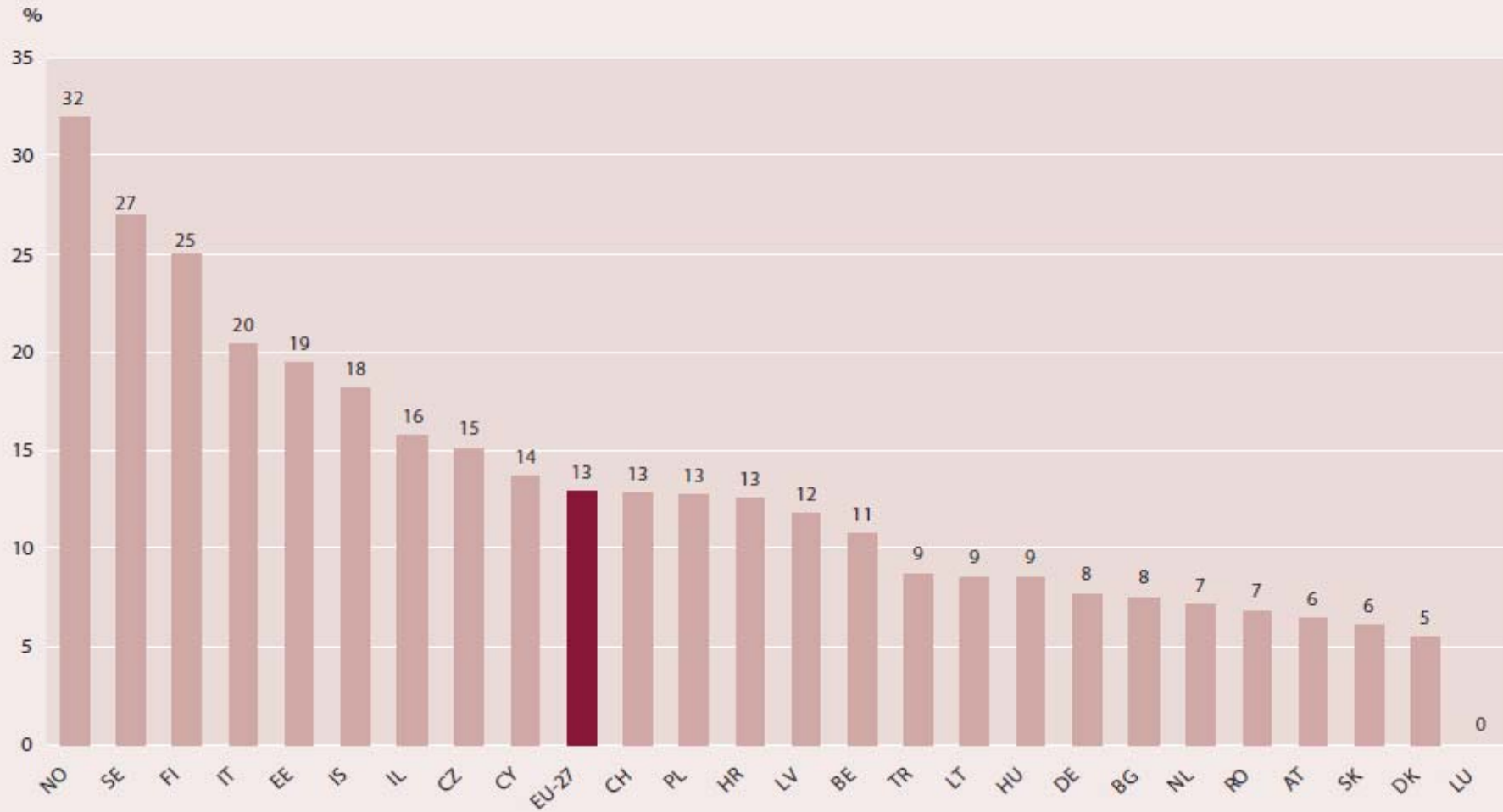
- ▶ from inertia to awareness and commitment ('There is no problem')
 - widespread ignorance and denial of the problem of gender inequality in science
 - raise awareness amongst decision-makers, as well as the public, to resist gender stereotyping
- ▶ from imbalance to balance ('Science is neutral, objective, and bias-free')
 - Implement mandatory gender balance (e.g. 40:60) in decision-making bodies
 - improve the current work-life balance, for the benefit of both women and men
 - closely monitor gender balance and justify any imbalance
- ▶ from opacity to transparency ("old-boy" networks lead to opaque decision-making)
 - lack of transparency in funding, promotion and nomination procedures tends to disadvantage women, esp. in top positions in science
- ▶ from inequality to quality ("fix the administration, not the women")
 - systematically introduce gender perspective in human resource development and in research
 - train the (male) decision-makers (including peers) to avoid gender bias
 - eradicate gender bias in research, as well as in recruitment and promotion procedures
 - Scientific reputation is determined by (informal, social) processes where 'fitting in' is a more important criterion in decision-making than actual performance
- ▶ from ignorance to knowledge (combat stereotypes with facts)
 - Collect sex-disaggregated data to allow calculating the cost of losing women in science
- ▶ from complacency to urgency ("Half of potential human knowledge is in female heads")
 - potential of our women in research is under-utilized
 - young people are staying away from science

Figure 3.4: Percentage of grade A staff among all academic staff by sex, 2007



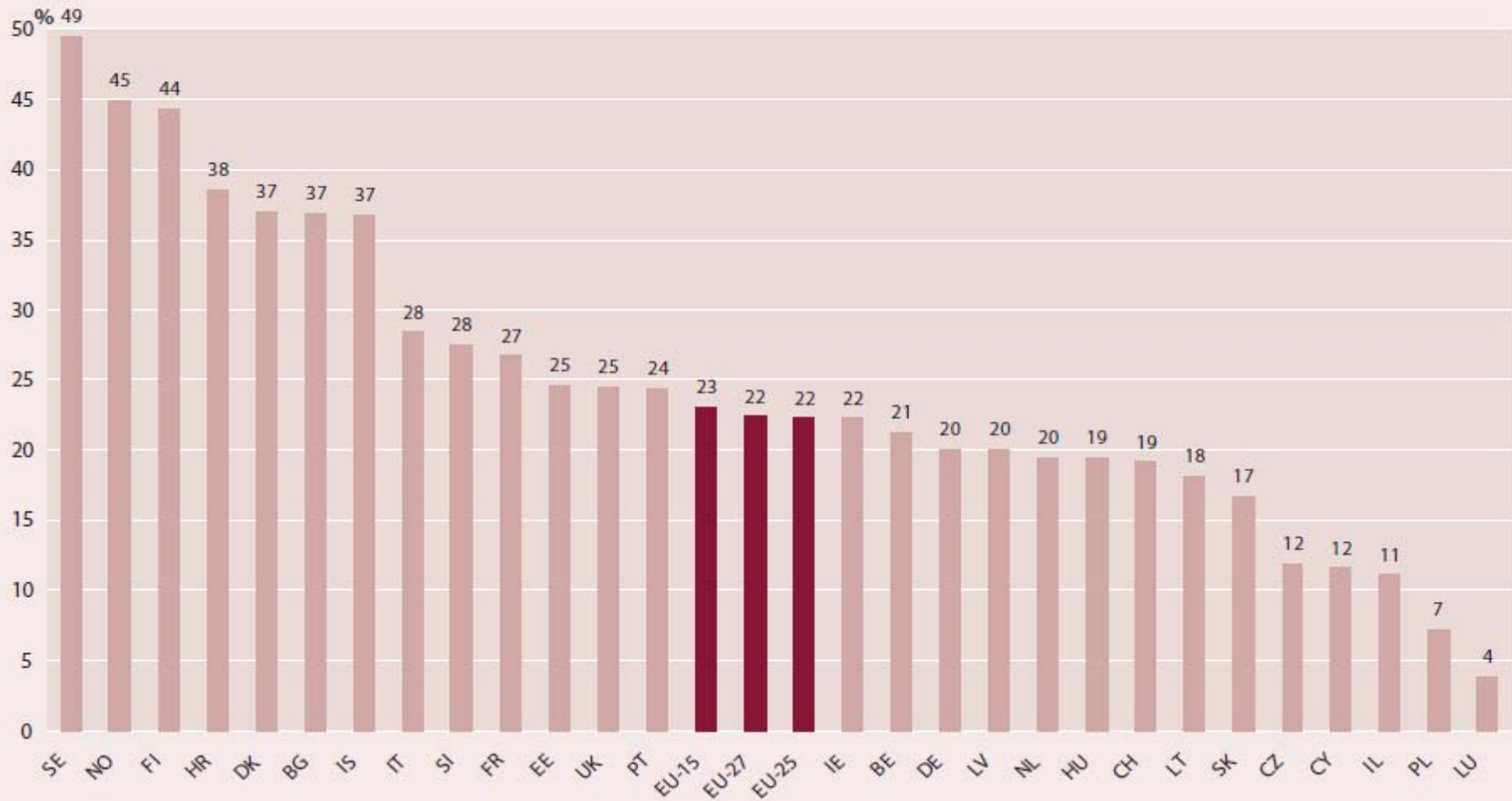
Source: WIS database (DG Research); Higher Education Authority for Ireland (Grade A)

Figure 4.1: Proportion of female heads of institutions in the Higher Education Sector (HES), 2007



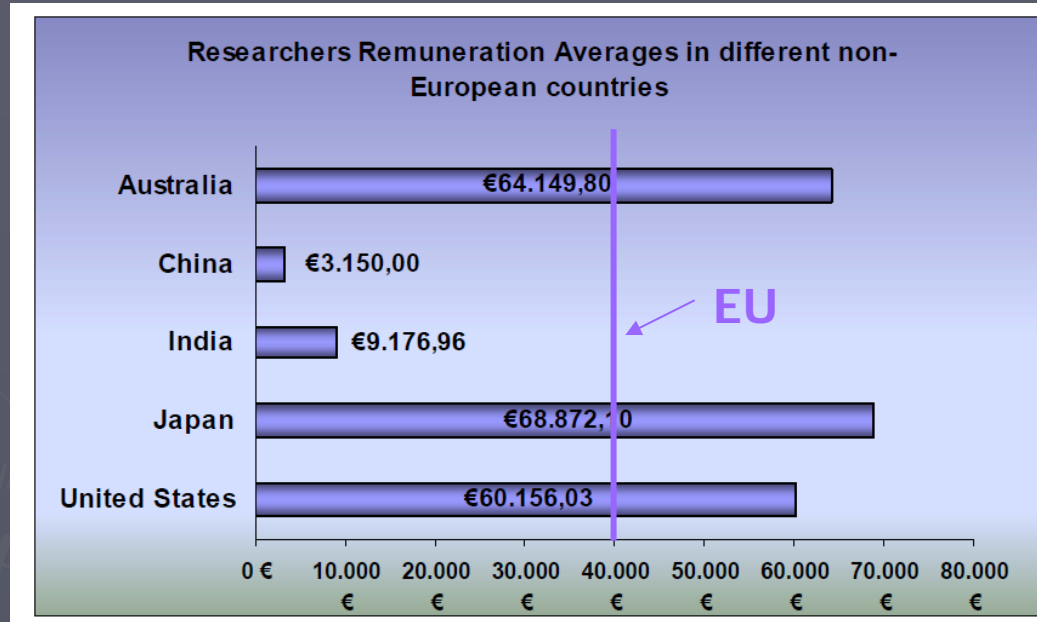
Avg: 13% in HES headed by women; Situation is worse for institutions with capacity to deliver PhDs : EU27 =9% women, 91% men at universities)

Figure 4.2: Proportion of women on boards, 2007



22% of board members are women

average salary for EU researchers is almost €23,000 less than the average in the US



Source: http://ec.europa.eu/eracareers/pdf/final_report.pdf (2007)

The level of public funding per researcher in Europe is significantly below that of the USA – by almost a factor of two.

Europe simply cannot reach the level of SET resources needed for its development without finding ways to remove its anachronistic science gender imbalance.

Source: EU needs more scientists, Conference Brussels 2004

http://ec.europa.eu/research/conferences/2004/sciprof/pdf/conference_review_en.pdf

Sexual harassment

► Taking women seriously, not just in the world of research, may not always be the norm:

- Complaints about sexual harassment (say in the form of sexualizing comments and 'jokes' directed at women) are often treated as unnecessary disturbances rather than a violation of rights.

For example, U.S. guest professors to Germany have been amazed at the lack of sensitivity of male professors regarding the issue.

- There is a tendency in the more old fashioned cultures to defend the right to discriminate in the area of research, and to criticize equality efforts as 'brainwashing' and 'American political correctness'.