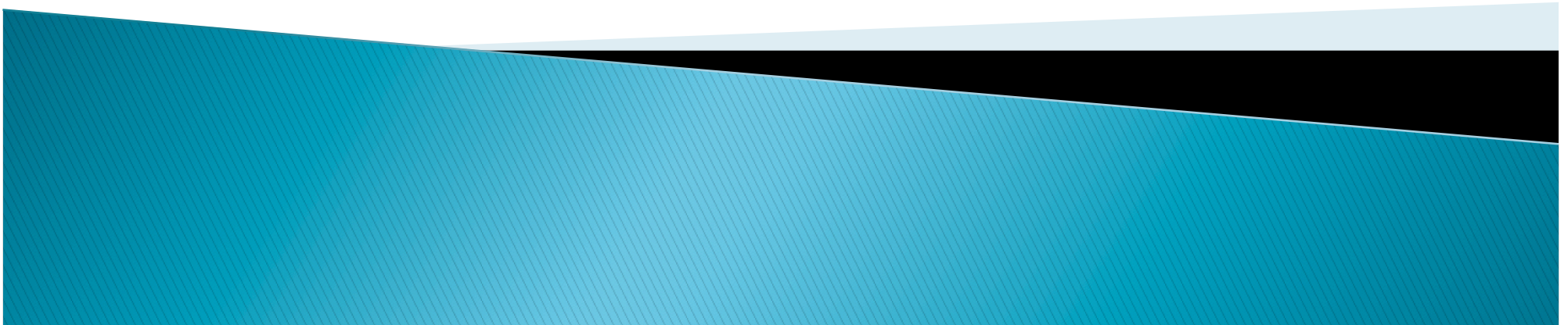


INWES Education and Research Institute

CCWE+20 workshop

Monique Frize

April 29, 2011



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Leadership in Engineering
Advice for Canada



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DU GÉNIE

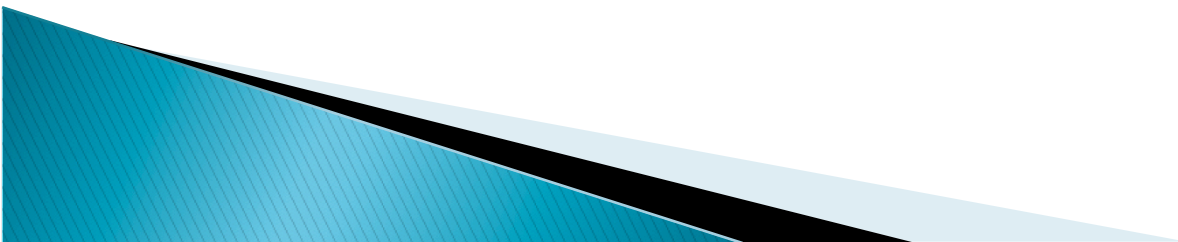
Chef de file en matière d'expertise-conseil
en génie pour le Canada

Steering committee

- ▶ Claire Deschênes, Université Laval
 - ▶ Valerie Davidson, Guelph University
 - ▶ Ruby Heap, Université d'Ottawa
 - ▶ Claude Laguë, Université d'Ottawa
 - ▶ Paula Leventman, Northeastern University (US)
 - ▶ Moyra McDill, Carleton University
 - ▶ Ken McMartin, Engineers Canada
 - ▶ Terry Peach, GE Canada
 - ▶ Coordinator: Danielle Plouffe
 - ▶ Chair: Monique Frize
- 

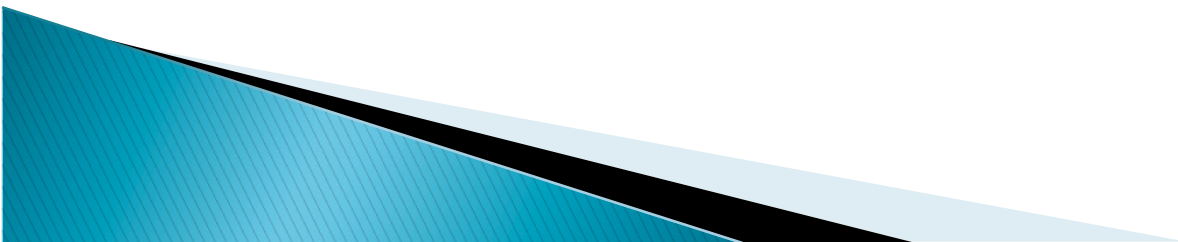
Historically....

- ▶ Northern Telecom/NSERC Women in engineering Chair (UNB) announced May 11'89
- ▶ Massacre at Ecole Polytechnique (Dec 6, 1989)
- ▶ Chair began a national mandate (Dec 11, 1989)
- ▶ CCWE (Feb 22, 1990) 19 persons: 6 public fora (Barriers and Bridges), over 200 memoirs sent in;
- ▶ 1991: Conference in Fredericton for more development of report.
- ▶ Report: 55,000 words; released in French and English April 1992. Signatures for implementation.
- ▶ 1995: Review: what has been done? Left to be done?



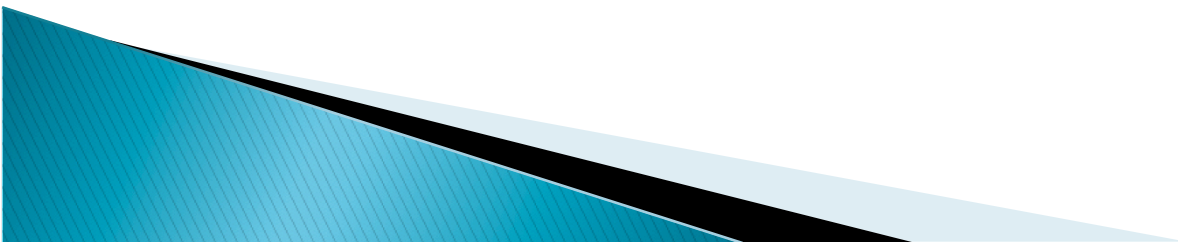
Follow-ups and other interventions

- ▶ 1996: NSERC report for Council (21 recommendations); 5 regional chairs
- ▶ 1998: CCWEST conference Vancouver
- ▶ 2000: CCWEST conference St-Johns, Nfld
- ▶ 2002: ICWES12/CCWEST and creation of INWES
- ▶ 2007: INWES Education and Research Institute
- ▶ 2009: The Bold and the Brave: A history of women in science and engineering
- ▶ 2011: CCWE+20...



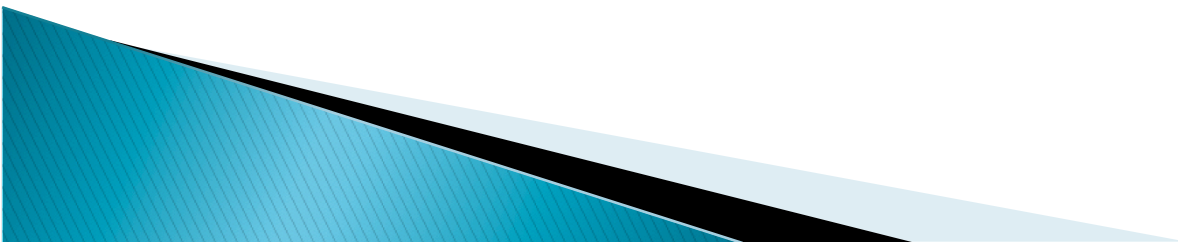
CCWE Report 1992

- ▶ Divided in chapters on:
 1. Youth (7 recommendations)
 2. Universities (10 recommendations)
 3. Workplaces (5 recommendations)
 4. Associations: scientific, professional, technical (7 recommendations)



CCWE+20

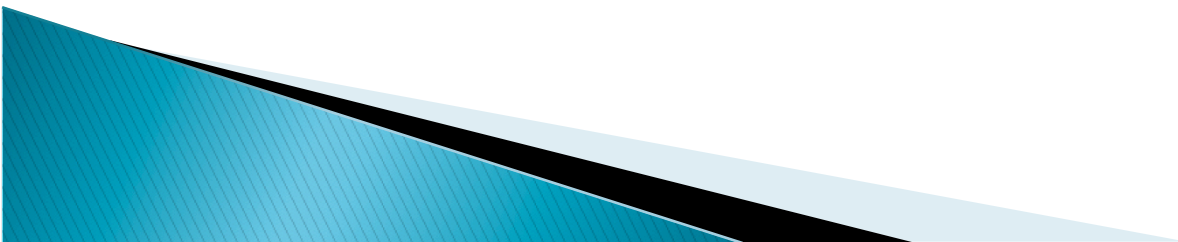
- ▶ Add granting agencies



Barriers: Youth

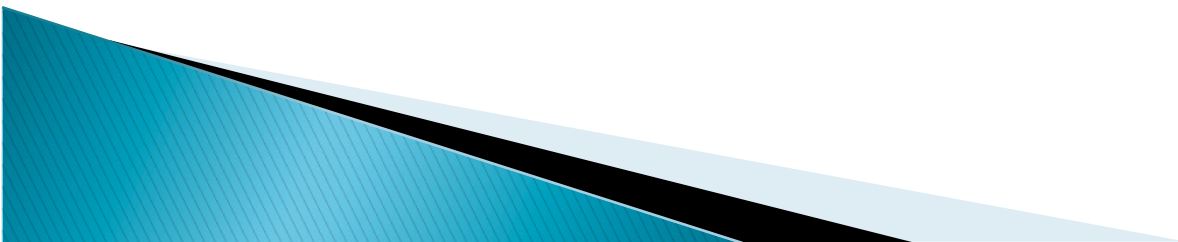
CCWE Report 1992

- ▶ Stereotyping that channel girls away from science and math
- ▶ At school, more discouragement by some teachers and guidance counsellors
- ▶ Lack of role models in engineering
- ▶ Perception engineering is a “male” profession; that high grades are needed; that engineers just build bridges and roads.



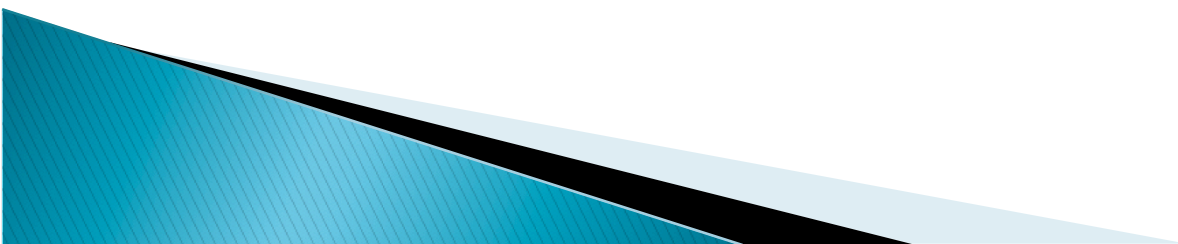
Bridges: Youth

1. Profile women engineers in active roles
2. Educators empower young women to develop self-esteem (K to 12)
3. Education Faculties teach equity issues, gender stereotyping and differences
4. Educators enhance learning experience of female students in math and science (develop interest and abilities and acquire pre-requisites for entry into engineering)



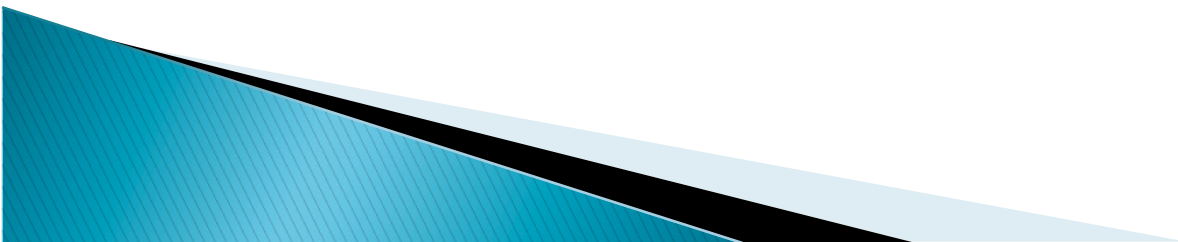
Youth continued...

- ▶ 5. Teachers and guidance counsellors to provide career information free of gender-bias, so young women choosing this feel informed, encouraged and supported.
- ▶ 6. Introduce girls and young women to role models in STEM
- ▶ 7. Educators and employers develop extracurricular programs to develop self confidence and competence in math, science, technology.



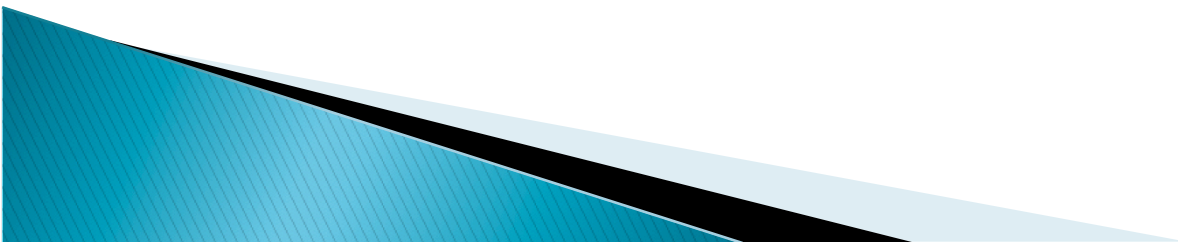
Barriers: Universities

- ▶ Some difficulty in adjusting to the pervasive male culture and curriculum that does not reflect women's perspectives
- ▶ Never meet or very few women professors
- ▶ Few women in graduate school
- ▶ Few universities have flexible tenure procedures and supportive policies to recognize difficulties of balancing family and demands of an academic career.



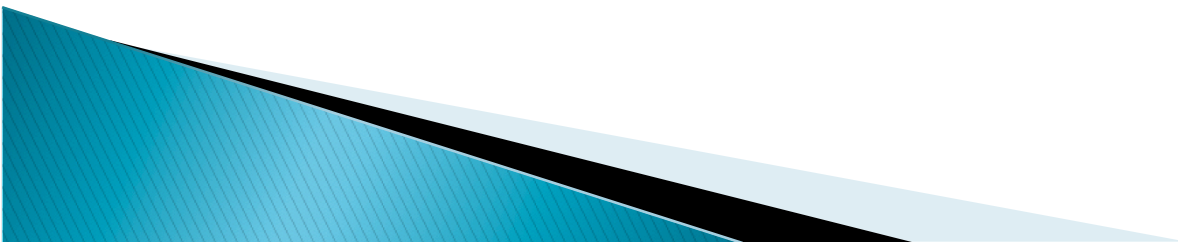
Bridges: Universities

- ▶ 8. Create attractive environment and commit to recruitment and retention of women faculty and students
- ▶ 9. Develop programs to attract women into undergraduate engineering programs
- ▶ 10. Encourage mature and other non-traditional students to enter into engineering
- ▶ 11. Establish academic adjustment and social support programs



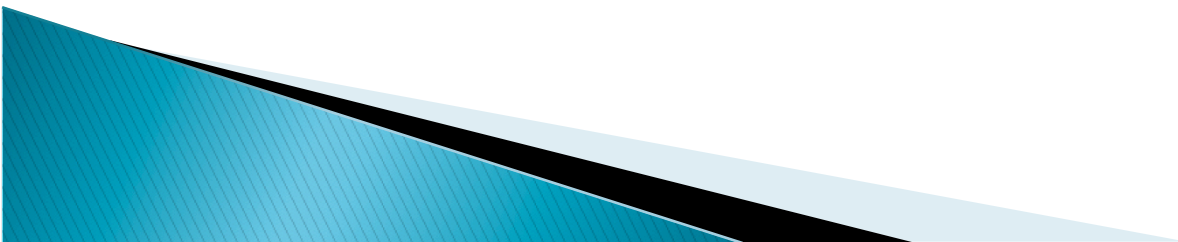
Bridges: Universities cont...

- ▶ 12. Create an environment that ensures physical, emotional, and psychological security of all students and contributes to a more positive image of engineering students
- ▶ 13. Accelerate efforts to attract women students to graduate studies (pool of women for faculty positions)



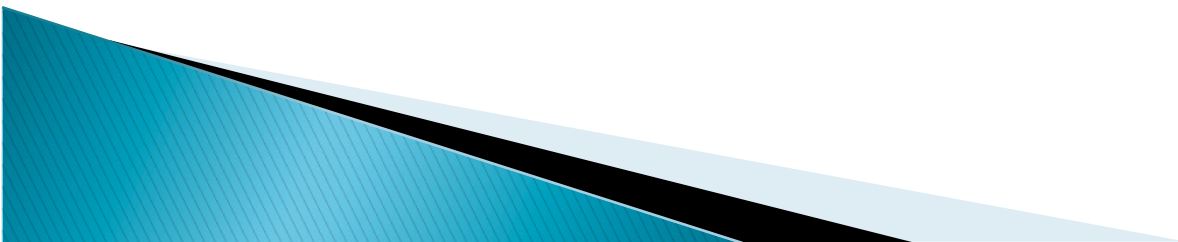
Bridges: Universities cont..

- ▶ 14. Action plan to increase the number of women faculty
- ▶ 15. Design tenure and promotion criteria and processes that allow parenting (maternity, paternity leaves) that do not jeopardize career



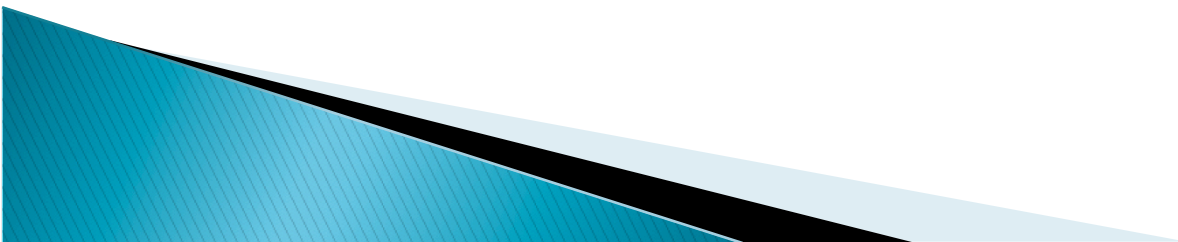
Bridges: Universities cont..

- ▶ 16. Curriculum be made relevant to current societal realities and future needs; understand impact of designs and decisions on people; develop understanding and appreciation for the humanities and social sciences
- ▶ 17. Develop and expand work–experience programs (to validate choice of career and relate engineering studies to workplace



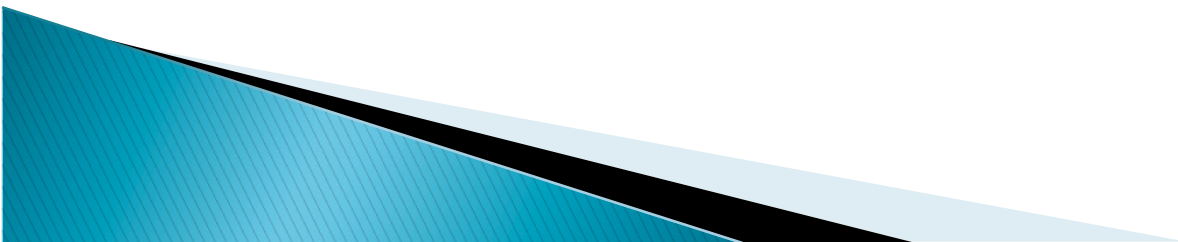
Barriers: Workplaces

- ▶ Women encounter attitudes and activities that are systemically biased against them.
- ▶ Many face discrimination in hiring, promotion, job assignments, salary
- ▶ Some experience harassment
- ▶ Many have to cope with isolation (only female on site)
- ▶ Not enough employers have policies that enable employees to balance family and career.



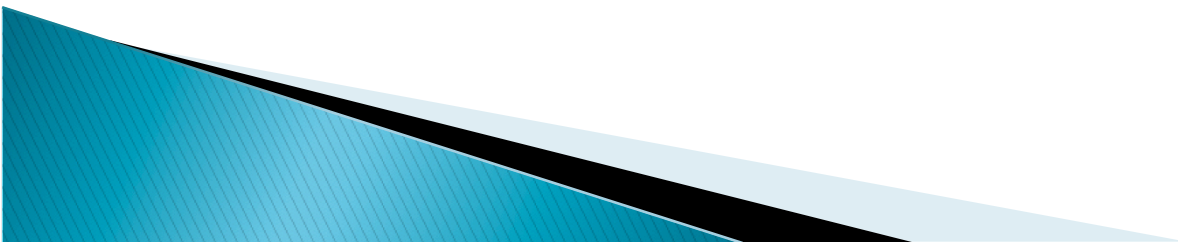
Bridges: Workplaces: Employers

- ▶ 18. Develop and implement strategies and policies that demonstrate commitment to hiring, promotion, and career development of women engineers and professionals
- ▶ 19. Develop recruitment practices to attract women engineers, ensure hiring the best qualified and most productive employees by creating a selection process that is fair, objective, and free of gender-bias.



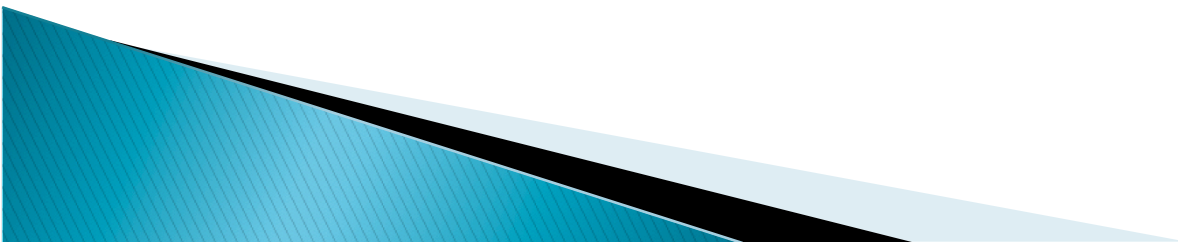
Bridges: Workplaces

- ▶ 20. Institute career development and promotion strategies to prepare women for management.
- ▶ 21. Adopt policies that support the professional, personal, family needs of employees, and ensure they can balance family responsibilities and career development.
- ▶ 22. Initiate, update, promote and enforce policies to eradicate harassment.



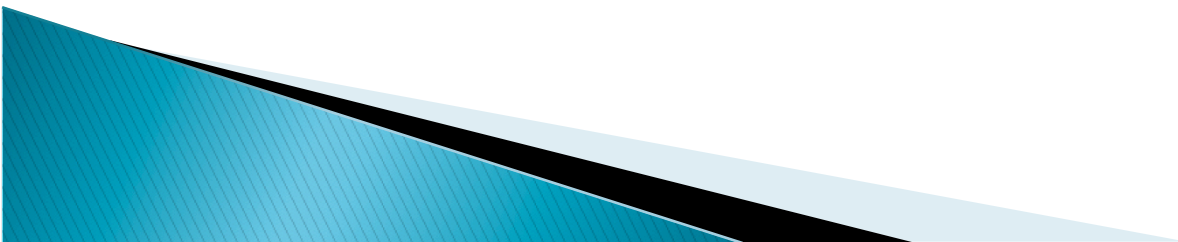
Barriers: Associations

- ▶ Women engineers are minorities in associations (in terms of membership, governance, prizes and awards, keynote and expert panel speakers).



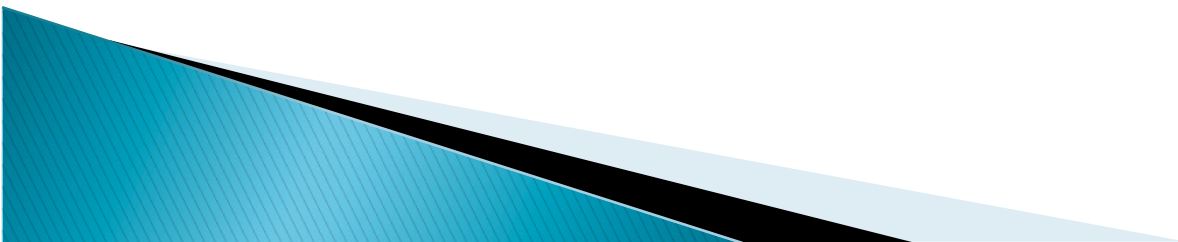
Bridges: Associations

- ▶ 23. Develop and institute programs for all members and engineers-in-training to ensure full acceptance of women in the profession; to eradicate harassment and discrimination.
- ▶ 24. Improve information base on equity and human resource distribution, by expanding regular member surveys.
- ▶ 25. Design and launch a public awareness campaign to promote engineering, especially as a career for women across Canada.



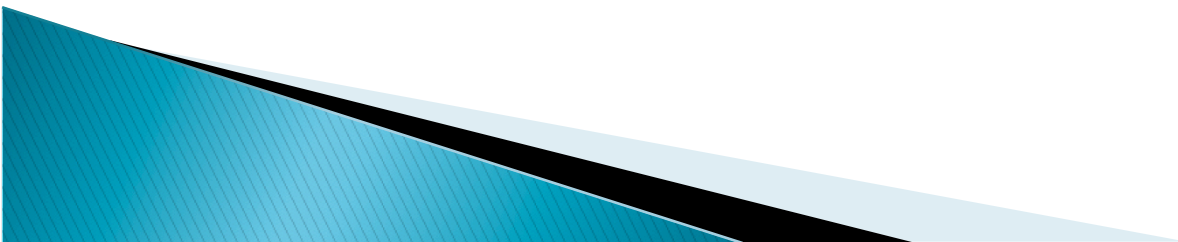
Bridges: Associations

- ▶ 26. Establish or expand comprehensive attraction programs at elementary and secondary schools in cooperation with other organisations involved in this work.
- ▶ 27. Develop voluntary career advisory programs to support and guide young people beginning their career.



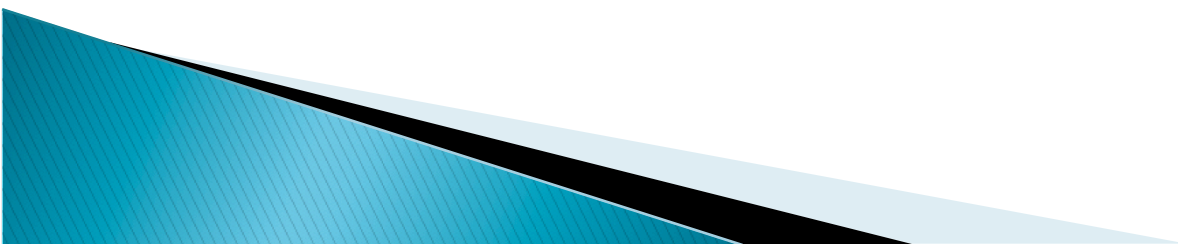
Bridges: Associations

- ▶ 28. Develop close working relationship with Faculties of Engineering to ensure students are aware of associations' expectations regarding fairness and equity.
- ▶ 29. Make employers aware of the different perspectives and qualities women bring to engineering works.



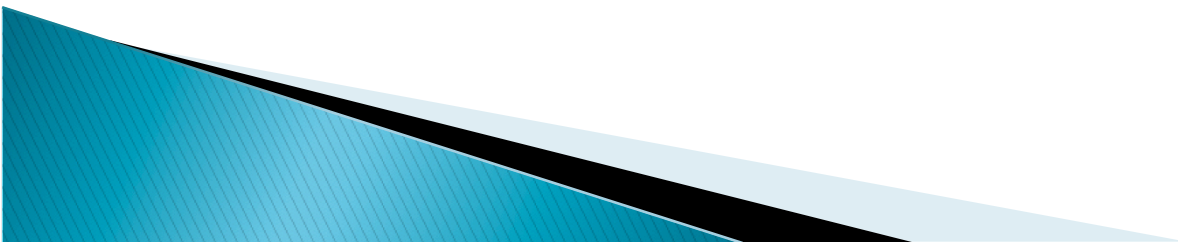
Making it happen

- ▶ Monitoring, measuring, reporting progress in implementation of recommendations.
- ▶ Ongoing media campaign to keep issues in public eye.
- ▶ Follow-up in stock-taking conference.
- ▶ Commitment from the top
- ▶ Gender sensitivity and awareness
- ▶ Women involved in the process of change



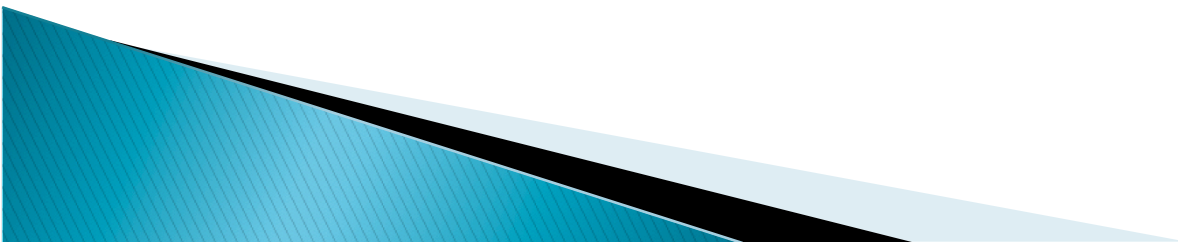
Making it happen

- ▶ Cooperation from educators, employers and engineers.
- ▶ Realistic and challenging goals.
- ▶ Mechanisms to measure and report on progress.



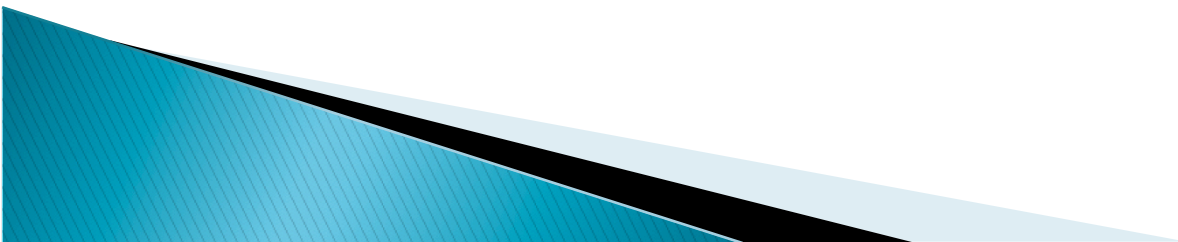
Goals: by 1997

- ▶ Girls and boys will pursue math and science in equal numbers (K-12)
- ▶ Women will comprise 25-35 % of first year engineering, 20 % Master's, 10% doctoral students, 5 % faculty across Canada.
- ▶ Women will comprise at least 18% graduates in engineering programs.
- ▶ More women engineers will be in senior management positions and on Boards of companies employing engineers.
- ▶ More women will be elected on Council and appointed to committees



Responsibilities

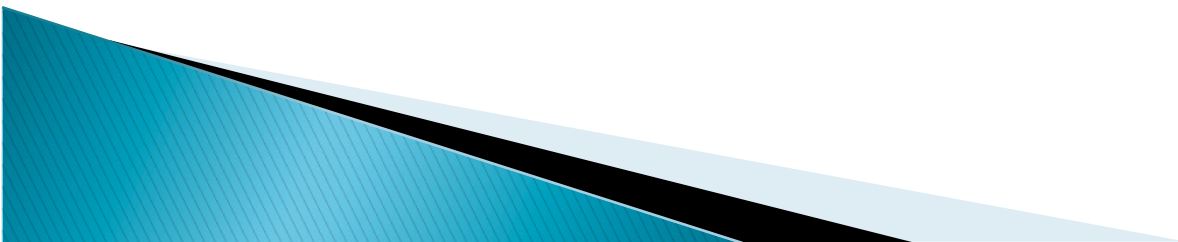
- ▶ Lead: for each sector.
- ▶ Supporting role.



Workshop goal

CCWE +20

- ▶ Increase the participation of women in engineering study programs and the profession by 2016; increase the participation of other underrepresented groups.



Workshop objectives

CCWE +20

- ▶ 1. Collect information on what has been done in the last 20 years; what has worked and what has not.
- ▶ 2. Assess differences between the generation of youth of 20 years ago and today; the culture; the environment; the economy.
- ▶ 3. Develop recommendations and strategies with timelines and outcomes that could be done in the next 5 years.
- ▶ 4. Prepare a resolution that participants can sign at the end of the workshop. Media release.
- ▶ 5. A report of main points will be published on INWES ERI's web site.

