

***CCWE+20 - Canadian Committee on Women in Engineering:
Female Representation Within the Engineering Profession***

Please note: The session is scheduled to be twenty minutes.

INTRODUCTION

- Hello, my name is Chantal Guay, Chief Executive Officer of Engineers Canada. I am so happy to speak today at C-C-WE. For those of you not familiar with us, Engineers Canada is the national body of the twelve provincial and territorial associations that regulate the practice of engineering in Canada and licence our nation's professional engineers.
- Twenty years! It is hard to believe. Congratulations on twenty successful years devoted to advancing the goal of getting more women involved in engineering.
- So how much has changed?
- Currently, four of the twelve presidents of the provincial and territorial regulatory associations are women. These presidents are in Alberta, Saskatchewan, Ontario and Quebec, meaning that now over ninety percent of the profession's membership is represented by female leadership.

- I am proud to say that it is an historic time for gender visibility in the profession and we should celebrate the progress we have made as much as possible.
- However, we cannot rest on our laurels and say our work is done, for there is still much to be accomplished.
- We are at a time when we need to not only expand the horizons of women, so that they consider careers in engineering, but we also have to expand women's perceived notions of what an engineer is.
- As all of today's delegates know, engineering touches so many areas of our daily lives, and being a professional engineer is an important and fulfilling career.

ENGINEERS CANADA'S WORK ON WIE

- As CEO of Engineers Canada, and as a female engineer, I'm proud that the organization and its Board of Directors are working hard on this issue.
- In fact, one aspect of Engineers Canada's strategic objectives is to facilitate communication with respect to diversity and equity concerns.
- A guiding principle at Engineers Canada is the belief that the profession be representative of Canadian society. We want to actively engage the

best minds in the profession, which means we must strive to have accurate female representation.

- Women have the capacity to gain the knowledge and skills to not only become part of the engineering profession, but to become leaders in the field.
- Together with our Board and our constituent associations, Engineers Canada has been working through our Women in Engineering Advisory Group and our Women in Engineering Task Force to identify strategies that could help to both encourage women into engineering and retain them in the workforce, eventually providing them with the opportunity to become future leaders.
- I'll provide you with a brief overview of our work on the issue since the first CCWE meeting.

OVERVIEW

- In 1995, Engineers Canada established a gender equity committee to review the results of the Canadian Committee for Women in Engineering study: *More Than Just Numbers*.
- In January 2000, Engineers Canada held a National Meeting on Women in Engineering in Ottawa. Representatives from all provincial

engineering associations, the NSERC Women in Engineering Research

Chairs and several other groups were in attendance.

- Engineers Canada's draft policy paper, *Diversity in Engineering*, was developed at this meeting.
- Following the approval of this policy, we formed the Women in Engineering Advisory Group to provide a forum for our constituent associations to discuss women in engineering issues, share activities and best practices, and recommend actions that foster understanding and growth in female representation across the country.
- We created the Women in Engineering Task Force to examine the issues facing the profession, to develop goals and objectives to increase the representation of women in engineering, and to provide recommendations to the Engineers Canada Board of Directors on how to proceed in these areas.
- Based on the results of a facilitated session held in April 2009, a series of recommendations on women in engineering were developed and approved by our Board in May 2009.
- Our recommendations, listed in order of priority, are:

1. Raise the profile and improving the image of the profession to improve young women's understanding of what an engineering career entails;
 2. Explore how the engineering curriculum and its delivery could become more attractive to a greater diversity of students.
 3. Help better prepare engineers for a diverse workforce.
 4. Demonstrate the value of diversity in engineering education and in the workplace.
 5. Promote information-sharing and mentorship programs, and promote the importance mentors play in attracting and retaining women in engineering; and
 6. Work with industry on methods to help improve the retention of female engineers in the workforce.
- Over the past year, our two Women in Engineering groups have been very busy.
 - We held a joint meeting in Toronto in September 2010 in order to coordinate efforts to understand how to attract more young women to an engineering career.

- We discussed issues surrounding the mandate, composition and future governance of our two women in engineering bodies.
- In other initiatives, Engineers Canada sponsored the national conference of the Canadian Coalition of Women in Engineering, Science, Trades, and Technology, held in May 2010 in Winnipeg.
- Engineers Canada partnered with the Ontario Society of Professional Engineers and the Women in Engineering Advisory Committee to administer a survey covering working conditions for professional engineers, the role of professional mentors, factors affecting career satisfaction, equity and fairness, and work-life balance issues.
- Engineers Canada commissioned a paper entitled *Paying Heed to the Canaries in the Coal Mine*, which explores the problem of why women are leaving the profession in Canada. Ultimately, the recommendations that come from this paper will be incorporated into a proposed *Practice Guideline for Diversity in the Workplace*.

- Suzelle Barrington represented Engineers Canada at the World Federation of Engineering Organizations conference in October in Buenos Aires, Argentina. As a member of the WFEO Standing Committee on Women in Engineering, Suzelle was involved in the publication of two documents; the first dealing with workforce diversity, and the second on capacity building in engineering. As well, work from Engineers Canada's Women in Engineering Advisory Group was referenced in the Women Workforce Diversity in Engineering pamphlet.
- In November, Engineers Canada sponsored the National Conference on Women in Engineering (NCWIE), an annual conference of the Canadian Federation of Engineering Students (CFES), held in Ottawa. I was pleased to be the keynote speaker for the event.
- Engineers Canada sponsored a Natural Sciences and Engineering Research Council (NSERC) Summit on increasing women's participation in science and engineering also in November 2010 in Ottawa.
- The Summit brought together Canada's leaders in academia, the private sector, and government to address opportunities for maximizing women's participation in the fields of science and engineering.

- Engineers Canada made a commitment to help NSERC in its efforts to increase the participation of women in engineering. The event offered a valuable opportunity for networking, information exchange, and sharing of best practices.
- I am also pleased to report that the Summit provided Engineers Canada with the opportunity to meet with Prime Minister Stephen Harper and Minister Rona Ambrose, the Minister for Status of Women, to discuss the issue of women in engineering.
- Other goals on this issue include increasing the visibility of the Women in Engineering section of Engineers Canada's website, Engineers Canada dot C-A, and have it be a premier resource on the topic of women in engineering.
- A vision document for an engineering workplace that is welcoming to women is being developed for use in best practice guidelines for industry, or in the creation of a corporate diversity champion award for engineering workplaces.

- Moving forward, our Women in Engineering Task Force has recommended that it be stood down, as its original intent was only to be short-term, and that a more permanent Engineers Canada's Women in Engineering Committee be established to help increase the participation of women in engineering and create partnerships with other engineering organizations with a similar goal.
- One of the proposed strategic elements for Engineers Canada is that thirty percent of licensed engineers are women by the year 2030.
- Research has shown that the tipping point – the point at which different ways of thinking or doing something becomes commonplace – is thirty percent. We acknowledge that this is a lofty goal, but it is important to aim high.
- Canadian women comprise the largest and best prepared under-represented demographic to help meet Canada's future needs. The potential for innovation and improved service to Canadians is expected to increase with a more gender balanced professional engineering workforce.

FEMALE UNDERGRADUATE ENROLMENT

- In order to create this balance, we need to study trends in enrolment at engineering institutions and the labour market.
- Engineers Canada maintains a database of undergraduate and graduate engineering enrolment and degrees awarded, using data collected from engineering schools across Canada.
- The latest report is for 2005 to 2009, and can be found on our website under the “Publications” menu on the home page.
- The upcoming 2006 to 2010 report’s theme will be gender visibility in engineering education, and we hope will provide insight on the presence of women in engineering faculties.

HIGHLIGHTS OF THE 2005-2009 REPORT

- Data collected for the report by gender offers comparisons between male and female enrolment trends.
- According to the 2005 to 2009 report, for the first time since 2001, the annual rate of growth in **female undergraduate enrolment** outpaced growth in male enrolment:

- 5.4 percent compared to 3.3 percent, with a total of 10,268 female undergraduates studying engineering in accredited Canadian programs in 2009.
- This resulted in a slight increase in the proportion of all undergraduate students who are women to 17.4 percent. Although this number is still substantially below the 2001 peak of 20.6 percent, the trend *is* encouraging.
- Over the past several years female students have been best represented in four undergraduate engineering programs: biosystems, environmental, chemical and geological engineering. The next best represented are materials/metallurgical, industrial/manufacturing and civil engineering.
- The lowest proportions of female enrolment were reported for electrical engineering, mechanical engineering, software engineering, and computer engineering.
- The proportion of **female graduate students** gradually increased and then decreased slightly between 2006 and 2009, and the rate of growth in male enrolment was greater than for female enrolment in 2009.
- There were 3,693 female graduate students in 2008, accounting for 21.3 percent of the total.

- With respect to the proportion of female master's students, it remained fairly constant over the past four years, at 22.3 percent of total enrolled master's students.
- And as for **Ph.D.** students, it appears that recent more rapid growth in the number of female relative to male doctoral students is being reflected in an increase in the proportion of doctorates being awarded to women.
- Obviously there is work to be done to ensure that women are aware of the potential of all areas of engineering, but we also want to examine why they go into the fields they do.

ENGINEERING LABOUR MARKET

- While this is all relatively good news, these facts only show that change has started.
- In the field of engineering, as with enrolment in undergraduate engineering programs, problems still exist.
- For example, while times *have* changed from when engineering was considered a male-only vocation, our most recent Engineers Canada membership survey revealed that women comprise only *10 percent* of all professional engineers in Canada while nearly *50 percent* of Canada's entire work force is made up of women.

- Change takes time, and it will obviously take a lot of time and a significant level of effort before we see companies embracing strategies that are more welcoming to women.
- I can't reinforce enough the importance of needing to raise the profession's profile and improve its image to help young women understand what it means to be an engineer, and working with industry on methods to help improve the retention of female engineers in the workforce.
- The enrolment and labour market facts I've gone over are encouraging, and demonstrate that, despite their continuing low numbers, women are excelling in engineering, and changes to the gender gap in engineering are slowly taking place.
- But what are the reasons behind the gap?
- We know it is about creating the right environment so women actually *want* to choose engineering education and careers.
- A study supported by Engineers Canada and the Canadian Coalition of Women in Engineering, Science, Trades and Technology or, C-C-WEST, surveyed young women about their attitudes towards math and science and careers in engineering and technology.

- It found that young women tend to equate engineering and technology with manual labour, working in a cubicle, and working with computers and machines instead of people.
- Women want to be involved in professions and organizations that are humanitarian and more socially engaging, such as Engineers Without Borders, which also helps to promote women engineers and fulfils their need to see concrete results.
- The desire to make a difference also means women are more likely to choose environmental or biomedical engineering over, say, mechanical or computer engineering, as demonstrated by the enrolment figures.
- These attitudes and trends demonstrate that the profession must do a better job of raising its profile and improving its image, and connecting what it does in meaningful ways to what future generations of women are looking for in a chosen career.

MENTORSHIP

- It can be daunting to be a woman in what is often seen as a male career choice, and once in the profession some women leave because of the challenges this creates.

- One of the ways to keep women engaged in engineering is to provide positive female role models, particularly in leadership roles, and encourage mentorship.
- Mentorship is key to learning the rules associated with decision-making, negotiation and organizational behaviour.
- The female leaders of the regulatory associations are examples of strong role models for current and future generations of engineers.
- Several of Engineer Canada's constituent associations offer mentorship programs which allow women in the profession to draw from the unique experiences and perspectives of other women engineers. You can find the list of our constituent associations on our website's home page.
- It's also promising that there are organizations out there to help women get into engineering.
- For example, while I've mentioned Engineers Without Borders and C-C-West, support is also available through the Canadian Engineering Memorial Foundation, a foundation established in 1990 following the École Polytechnique tragedy that ended the lives of 14 female students.

- The Foundation offers a scholarship program to promote engineering as a career choice for young women. Engineers Canada provides regular support to this organization, including through staff fund raising efforts.
- There is also WISEST (Women in Scholarship, Engineering, Science and Technology) at the University of Alberta, a program that, through collaboration with industry, government, academia, and volunteers, deliver programs and networks that enhance the attraction, retention and advancement of women of all ages in science, engineering and technology.
- There are many other programs out there with the goal of enhancing the experience and increasing the numbers of women in engineering.
- Our hope it that through collaboration and events such as these we can pool our collective expertise and come up with even more results.

CONCLUSION

- Some people may wonder why gender imbalance should still even matter. The issue is not simply gender, but diversity. As I mentioned earlier, for the engineering profession to truly reflect the composition of Canadian society we need the best minds, both male and female, contributing differing perspectives and creating the best solutions and innovations, which ultimately benefit the public.

- I strongly believe that increased diversity will further enhance the profile of our profession and benefit society at large.
- We need to demonstrate to young women the extent to which engineers make a difference in people's lives, to make them feel that what they do is worthwhile.
- A point that often comes up for why women don't stay in the profession is the challenge in balancing family life and work demands. The reality is that in general, family roles and responsibilities are often different for women. Instead of pretending that everyone operates the same way, we need to recognize and encourage these differences and help everyone, male and female, work to their advantages.
- We need to continue to strive to create flexible, open, and encouraging places for women to pursue engineering, at school and in the workforce.
- I want women to stay excited about being involved in a diverse and multidisciplinary field as engineering.
- If even some of the women currently enrolled in engineering programs stay in the profession or go on to become executives or engineering

professors, then the next generation of young women will have more role models to look up to, potentially encouraging them to pursue engineering careers, which will continue the positive growth cycle.

- It's a slow process, but worth pursuing, as a more balanced profession means a better profession.
- I'm looking forward to the work that lies ahead. Again I appreciate the opportunity to be here today and to have had this chance to speak to all of you. My wish is that in another twenty years we will have achieved all our goals and more with respect to women in engineering.
- Thank you.

ANY QUESTIONS?