

INWES Education and Research Institute

CCWE<sup>+20</sup> National Workshop Project

Final Report

July 2011

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## EXECUTIVE SUMMARY

The INWES Education and Research Institute<sup>1</sup> are pleased to provide its many readers across Canada, the USA, and the world with the final report of its most recent project and great success: the CCWE<sup>+20</sup> National Workshop held in Ottawa (Canada), April 29th and 30th, 2011.

This document was meant to be a concise report on the history leading to CCWE<sup>+20</sup>, the overall goals and objectives of this national workshop, the key stakeholders and decision-makers taking part, the inspiring presentations, and the process leading to the formulation of 25 new recommendations aimed at increasing the participation and role of women in the engineering profession.

Nine appendices<sup>2</sup> allow the reader to indulge in all levels of details, from lists of Steering Committee members, of participants, and of presenters, to copies of the original documents used during the 2-day session (i.e. questions framing discussions) and documents produced thereafter (the 25 new recommendations directed at youth, universities, associations, workplaces, and granting agencies), to treasured evaluations and post-conference comments. You will also find the July 26, 2011 press release as well as a list of acronyms intended to facilitate reading in spite of best efforts to minimize their use.

We trust you will enjoy this report, and we'd love to hear from you on this and other related issues. Send us your comments through our website [www.inwes.org](http://www.inwes.org) and click on *CCWE<sup>+20</sup> Comments*. Hope to hear from you soon! And feel free to pass this on to friends, colleagues, and all other parties interested in “building bridges” for women in science, technology, engineering and mathematics.

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<sup>1</sup> The INWES ERI was formed in order to advance education in the fields of science, technology, engineering and mathematics (STEM) worldwide. For more information, visit the website at [www.inwes.org](http://www.inwes.org).

<sup>2</sup> Documents appear in the language of origin, English or French.



## MESSAGE FROM THE CHAIR

It is with great pleasure that I write the introduction to the final report of the CCWE<sup>+20</sup> with the purpose of also providing important historical background. On May 11, 1989, the University of New Brunswick announced a new Chair, Northern Telecom/NSERC Women in Engineering Chair. The university interviewed me in September and I was selected as the first chair holder in November. On December 6, 1989, we all recall the massacre at *École Polytechnique*, so my first task as Chair was to attend the funeral in Montreal on December 11. This most horrific act and the fact that there were so few women studying in engineering at the time (13%) and few women engineers (4%) jolted engineers and non-engineers into open discussions about the issues limiting women's participation in the profession. Thus the *Canadian Committee on Women in Engineering* was born.

Initiated by Industry Science and Technology Canada (ISTC) on February 22, 1990, the project was funded by Employment and Immigration Canada (EIC) under its Industrial Adjustment Service and supported by four signatories: The Canadian Council of Professional Engineers (CCPE), the Association of Consulting Engineers of Canada (ACEC), the Association of Universities and Colleges of Canada (AUCC), and the Canadian Manufacturers' Association (CMA). Financial support was also provided by Noranda Inc., the SNC Group, GE Canada, Dofasco Inc., Sandwell Inc., Cominco Ltd., Simons Ltd., Hudson Bay Mining and Smelting Co Ltd., John Labatt Ltd., the University of New Brunswick, and the City of Fredericton. Jeanne Inch was coordinator, helping to organize the assemblies and meetings of the national committee. In addition to the six founding members, the CCWE had 13 other members representing deans, students, professors. The CCWE held 6 public forums from Vancouver to Halifax, received over 200 briefs and memoirs, and held a national conference in Fredericton in 1991. All the information collected is documented in a report entitled *Women in Engineering: More than just numbers*, released in April 1992. The report proposed 29 strong recommendations for early education, universities, workplaces, and professional engineering associations.

Much progress was observed between 1989 and 2002, with women studying engineering at the undergraduate level increasing from 13 % to 22 %, with similar numbers at the Master's level. Increases were also seen at the Doctoral level and in the number of women faculty. However, a serious decline began in 2003 and continued in the following years. The proportion of women who are studying engineering is now level at 17.4 %. After 20 years, it was time to take a look again at the women in engineering

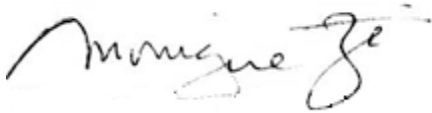
issue, to assess whether the barriers to women becoming engineers were similar to those found in 1992, and to identify strategies to increase the participation of women in the profession.

In August 2010, I contacted Danielle Plouffe, who represented EIC in the CCWE, to ask if she would help me to organize a workshop at the end of April 2011. She agreed, and I proceeded to create a Steering Committee (APPENDIX A) with a few members from the original CCWE (Terry Peach at GE Canada, Janis Peleshok, formerly a student at U of Toronto) and six other key individuals. (See appendix for the list of members). I wish to thank all of them most sincerely for helping Danielle and I with the guest list, the questions to guide group discussions, the program, and several other important aspects to make this an effective workshop. We are also most grateful for the generosity of our sponsors, without whom CCWE<sup>+20</sup> would not have been possible.

Over seventy persons (APPENDIX B) attended this national workshop and enthusiastically participated in discussion groups and in the formulation of new and innovative recommendations to increase the participation of women in the engineering profession which we hope will make a significant difference in the years ahead. As can be seen by the evaluation of the event, the post-conference comments received and the excellent recommendations proposed, the workshop was a great success. The participants chose three top priorities which were announced in a press release in July and are detailed in the report. As the participants were preparing to leave Ottawa, many voiced the hope that this process would be repeated in a couple of years. We definitely took note and I intend to create a Standing Committee in the late summer to monitor follow-up initiatives to the recommendations and to develop the ideas for a follow-up workshop in 2013.

The INWES Education and Research Institute (ERI) is very proud to have lead this project. As I look back at this exciting project, I must say that I felt for the first time in many years a real optimism for the future. I also noticed this optimism around the table at this event. There was enthusiasm, intelligence, innovative ideas, and a lot of energy during those two days in April. I close by quoting Dr. Axel Meisen's post-conference comment: "I would like to congratulate you on the fine workshop that you and your colleagues organized. It identified important new issues and shed new light on some old ones. I believe that we made progress in transitioning from 'chipping away at the problems' to 'cracking them'." *Axel Meisen* - Canadian Commission for UNESCO / Alberta Innovates – Technology Futures

Thank you Axel, thank you all for this great journey into the women in engineering world! In the hope that many girls will discover this interesting profession and all the opportunities it offers!

A handwritten signature in black ink, appearing to read 'Monique Frize', with a stylized flourish at the end.

Monique Frize, Chair CCWE<sup>+20</sup>  
President, INWES ERI

## CCWE<sup>+20</sup> OVERALL GOAL & OBJECTIVES

**THE PROJECT:** A workshop on women in the engineering profession.

**LOCATION AND TIME:** Ottawa, April 29 and 30, 2011.

**THE OBJECTIVES:** To examine the barriers that continue to limit the participation of women in the engineering profession, update our inventory of best practices, and build more bridges to increase women's participation in engineering programs and consequently, in the profession.

**RATIONALE:** The *Canadian Committee on Women in Engineering* (CCWE) official report released in April 1992, made 29 recommendations designed to breakdown stereotypes in early education, universities, workplaces, and professional associations. Now, twenty years later, it was time to bring together, yet again, key stakeholders from these communities of interest to review what had taken place over the years.

### OVERALL GOAL

*Increase the participation of women and other underrepresented groups in engineering study programs and in the profession.*

Women in..	CCWE1992 Goals for 1997	Actual 2009	CCWE <sup>+20</sup>
Women in 1 <sup>st</sup> year Undergrad studies	25-35%		
Women enrolled undergraduate programs		17.4%	
Master's studies	20 %	24.1%	
Doctoral studies	10 %	22%	
Faculty members: <b>professors</b>	5%	Full 7% Associate 11% Assistant 18%	
Women graduating with Eng. Degree	18 %	17.6%	
Profession	-	10.4%	

**CCWE<sup>+20</sup> concrete objectives:**

1. Collect information on what has been done in the last 20 years; determine what has worked and what has not.
2. Assess differences between the generation of youth of 20 years ago and today.
3. Develop recommendations and strategies with timelines and outcomes that could be implemented in the next 5 years.
4. Prepare a *declaration* that all can sign and commit to before leaving.
5. Make the CCWE<sup>+20</sup> National Workshop report available on INWES-ERI's website.



## INVITATION



### *The Canadian Committee on Women in Engineering - CCWE<sup>+20</sup>*

The *Canadian Committee on Women in Engineering - CCWE<sup>+20</sup>*, some 20 years after its initial cross-Canada endeavour aimed at increasing the participation of women in the engineering profession, is pleased to invite you to its **National Workshop** to be held in Ottawa, ON (CANADA), **April 29/30, 2011**.

Participation by women in the Engineering profession remains low, and Canada is missing out on a great source of innovative talent. Progress is being made, but we need your help in the quest to find solutions.

CCWE's report<sup>1</sup>, released in April 1992, made 29 recommendations designed to breakdown stereotypes in early education, universities, workplaces, and professional associations. A detailed account of what has been achieved since will be presented and will also serve as the foundation for new strategies workshop participants will develop for the future.

Funding for the CCWE<sup>+20</sup> Workshop which is organized by the *INWES Education and Research Institute (INWES-ERI)* will come from corporate donations and the **participation fee<sup>2</sup> of \$150.00** which will cover meals and social events yet each participant is expected to cover the cost of hotel rooms and other personal expenses.

We trust that **you or your designate** will be able to join the 60-75 key people in the development of more strategic recommendations intended to shape the future of the engineering profession. An early **e-mail confirmation** would be most appreciated.

Do not hesitate to contact either of the undersigned and/or our project coordinator, Danielle Plouffe at [dcplouffe@gmail.com](mailto:dcplouffe@gmail.com) for any queries you may have regarding this event.

Warm regards,

Monique Frize  
Chair, CCWE<sup>+20</sup>/ former Chair of CCWE  
President, INWES ERI  
[mfrize@gmail.com](mailto:mfrize@gmail.com)

Terry Peach  
Manager - Organization and Staffing  
GE Canada - Corporate Human Resources  
former member of CCWE  
[terry.peach@ge.com](mailto:terry.peach@ge.com)

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<sup>1</sup> Web site for CCWE report (1992) including its 29 recommendations: [http://www.carleton.ca/cwse-on/resources\\_reports.htm](http://www.carleton.ca/cwse-on/resources_reports.htm)

<sup>2</sup> The participant fee will be waived for donations at the GOLD or PLATINUM levels (see ANNEX).

# INVITATION



*Le Comité canadien des femmes en ingénierie CCFI/CCWE<sup>+20</sup>*

Madame/Monsieur,

C'est avec grand plaisir que le *Comité canadien des femmes en ingénierie /The Canadian Committee on Women in Engineering – CCFI/CCWE<sup>+20</sup>*, quelque 20 années après sa première initiative transcanadienne visant à accroître la participation des femmes en ingénierie, vous invite à son **Atelier national** qui aura lieu à Ottawa, ON (CANADA), les 29 et 30 avril 2011.

La participation des femmes en ingénierie s'avère toujours faible, ce qui a pour conséquence de priver le Canada d'une source importante de talent novateur. Des progrès continuent de s'accomplir, mais nous avons besoin de votre aide dans notre recherche d'autres solutions ingénieuses.

Le rapport du CCFI<sup>1</sup>, paru en avril 1992, présentait 29 recommandations visant à combattre les stéréotypes répandus dans les milieux d'enseignement préscolaire et primaire ainsi qu'universitaire, dans les milieux de travail, et au cœur des associations professionnelles. Un bilan détaillé des progrès accomplis jusqu'ici sera présenté en début d'atelier dans l'intention de servir de fondement à la conception de nouvelles stratégies pour les années à venir.

Le financement pour l'Atelier CCFI/CCWE<sup>+20</sup> qu'organise le *INWES Education and Research Institute (INWES-ERI)* proviendra de dons du monde des affaires et des frais d'inscription<sup>2</sup> de 150 \$, ces derniers couvrant les repas et rencontres sociales prévues. Tous les participants devront cependant couvrir les coûts d'hôtel ainsi que toutes dépenses personnelles.

Nous souhaitons ardemment pouvoir vous compter (ou la **personne désignée** qui vous remplacera), parmi les 60-75 personnes dont l'expertise permettra de construire des stratégies dynamiques qui façonneront l'avenir de la profession. Votre **réponse** rapide par **courriel** serait fort appréciée.

N'hésitez surtout pas à communiquer avec les soussignés ou avec la coordonnatrice du projet, Danielle Plouffe au [dcplouffemail.com](mailto:dcplouffemail.com) pour toute question ou commentaire.

Au plaisir de vous accueillir à cet atelier national,

Monique Frize  
Présidente, CCFI/CCWE<sup>+20</sup> / Présidente du CCFI  
Présidente, INWES ERI  
[mfrize@gmail.com](mailto:mfrize@gmail.com)

Terry Peach (membre du CCFI)  
Gestionnaire, Organisation et Dotation  
GE Canada – Ressources humaines  
[terry.peach@ge.com](mailto:terry.peach@ge.com)

<sup>1</sup> Ce rapport du CCFI/CCWE (1992) y compris ses 29 recommandations n'est disponible qu'en anglais pour l'instant au [http://www.carleton.ca/cwse-on/resources\\_reports.htm](http://www.carleton.ca/cwse-on/resources_reports.htm).

<sup>2</sup> Les donateurs des catégories Or et Platine seront exemptés des frais d'inscription (voir l'Annexe qui suit).



## *The Canadian Committee on Women in Engineering - CCWE<sup>+20</sup>*

### ANNEX

#### Request for funding

Still very much in the early planning stage, the **CCWE<sup>+20</sup>** is seeking funding for its workshop activities and as well, to provide some financial support to student participants who are an important part of this process. A charity receipt can be issued upon request for all financial contributions received.

**Can we count on you and/or your organization to provide funding to this National Workshop?**  
If so, please contact either Monique Frize or Terry Peach directly.

With our most sincere thanks,

Monique Frize  
Chair, **CCWE<sup>+20</sup>** / former Chair of CCWE  
President, INWES ERI  
[mfrize@gmail.com](mailto:mfrize@gmail.com)

Terry Peach (former member of CCWE)  
Manager - Organization and Staffing  
GE Canada - Corporate Human Resources  
[terry.peach@ge.com](mailto:terry.peach@ge.com)

#### SPONSORSHIP PROGRAM (in CAD \$)

##### **BRONZE LEVEL** (\$500 to \$1000)

Sponsor name is mentioned on ERI website, in program brochure for event, and in the Annual Report.

##### **SILVER LEVEL** (\$1001 to \$2500)

Name and logo will be on ERI website, in the program brochure where relevant, and a quarter-page ad in the Annual Report.

##### **GOLD LEVEL** (\$2501 to \$5000)

Same as Silver, except a half-page ad in the Annual Report. Workshop participation fee is waived for one person.

##### **PLATINUM LEVEL** (\$5001 to \$10,000)

Same as Gold, except a full-page ad in the Annual report. Workshop fee is waived for two persons. Corporation will be mentioned in press releases, media information kits, other publicities and on the menu or the special dinner Friday.



*Le Comité canadien des femmes en ingénierie CCFI/CCWE<sup>+20</sup>*

## ANNEXE

### Demande de financement

En plein dans la phase planification, le CCFI/CCWE<sup>+20</sup> est à la recherche de financement pour les activités liées à cet Atelier national et dans le but aussi de pouvoir offrir un soutien financier aux étudiants en génie dont la contribution est indispensable au processus. Un reçu officiel d'organisme de bienfaisance sera émis sur demande pour toute contribution en argent.

Pouvons-nous compter sur **votre contribution ou une contribution de votre organisation à notre Atelier national**? Dans l'affirmative, veuillez communiquer directement avec Monique Frize ou Terry Peach.

Avec nos remerciements anticipés,

Monique Frize  
Présidente, CCFI/CCWE<sup>+20</sup> / Présidente du CCFI  
Présidente, INWES ERI  
[mfrize@gmail.com](mailto:mfrize@gmail.com)

Terry Peach (membre du CCFI)  
Gestionnaire, Organisation et Dotation  
GE Canada – Ressources humaines  
[terry.peach@ge.com](mailto:terry.peach@ge.com)

#### PROGRAMME DE PARRAINAGE (\$ CAD)

##### **CATÉGORIE BRONZE** (500 \$ à 1 000 \$)

Le nom des donateurs figureront sur le site Web ERI, au Programme de l'Atelier national ainsi que dans le Rapport annuel.

##### **CATÉGORIE ARGENT** (1 001 \$ à 2 500 \$)

Le nom et le logo des donateurs figureront sur le site Web ERI, au Programme de l'Atelier national, et un quart de page leur sera consacrée dans le Rapport annuel.

##### **CATÉGORIE OR** (2 501 \$ à 5 000 \$)

Tout comme la CATÉGORIE ARGENT sauf qu'une demi-page leur sera consacrée dans le Rapport annuel. Ces donateurs profiteront d'une exemption des frais d'inscription pour une personne.

##### **CATÉGORIE PLATINE** (5 001 \$ à 10 000 \$)

Tout comme la CATÉGORIE OR sauf qu'une pleine page leur sera consacrée dans le Rapport annuel. Ces donateurs profiteront d'une exemption des frais d'inscription pour deux personnes. Ces entreprises seront mentionnées dans les communiqués de presse, les pochettes d'information des médias et autres documents publicitaires, et au menu du souper-conférence du vendredi.

# PROGRAMME

INWES-ERI / CCWE <sup>+20</sup> - Programme					
Ottawa University - Tabaret Hall - Senate Room - TBT 083					
April 29th, 2011	DAY 1 - What has been done		April 30th 2011	DAY 2 - Strategies for the next 5-10 years	
				<i>with timelines, deliverables, how to achieve</i>	
08:00 - 09:00	Breakfast & Registration		08:00 - 08:30	Breakfast	
09:00 - 09:30	Word of Welcome	Claude Laguë	08:30 - 08:50	National Science Foundation - ADVANCE Program	Catherine Mavriplis
	CCWE Report	Monique Frize	08:50 - 09:10	Status report - USA	Paula Leventman
09:30 - 10:30	WISE: update region	Regional Chairs	09:10 - 09:30	NCDEAS - looking into the future	Claude Laguë
10:15 - on	coffee break*		10:15 - on	coffee break*	
10:30 - 10:50	Engineers Canada (Task Force / WIEAG)	Chantal Guay	09:30 - 11:30	Working groups develop recommendations for next decade	
10:50 - 11:10	NSERC	I.Blain/E.Megyeri-Lawless			
11:10 - 11:30	UNESCO	Axel Meisen	11:30 - 12:00	PLENARY	
11:30 - 12:00	... from the floor	Moderator: M. Frize		Working Groups report on <i>Youth and Universities</i>	Moderator: M. Frize
12:00 - 13:00	LUNCH*		12:00 - 13:00	LUNCH*	
13:00 - 13:30	UOWERG report	Ruby Heap	13:00 - 15:00	Working groups develop recommendations for next decade	
14:45 - on	coffee break*		14:45 - on	coffee break*	
13:30 - 15:30	Working Groups meetings - Cf. <i>nota</i>		15:00 - 16:30	PLENARY	Moderator: M. Frize
15:30 - 17:00	Working groups reporting	Moderator: M. Frize	Working Groups report on <i>Workplaces, Associations, Granting Agencies</i>		
18:00	Pre-dinner reception - NOVOTEL		16:30 - 16:45	Closing remarks	
18:30	Dinner with guest speaker - NOVOTEL			NOTE: dinner on your own	

***Nota: please refer to Appendix C for the list of presenters, abstracts and biographical notes.***

# PROGRAMME

INWES-ERI / CCFI <sup>+20</sup> - Programme					
Université d'Ottawa - Pavillon Tabaret - Salle du Sénat - TBT 083					
le 29 avril 2011	JOUR 1 - Ce qui a été accompli		le 30 avril 2011	JOUR 2 - Stratégies pour les 5-10 prochaines années	
				<i>y compris les objectifs visés, les délais, et le "comment faire"</i>	
08:00 - 09:00	Déjeuner et Inscription		08:00 - 08:30	Déjeuner	
09:00 - 09:30	Mot de bienvenue	Claude Laguë	08:30 - 08:50	National Science Foundation - ADVANCE Program	Catherine Mavriplis
	Le Rapport CCFI/CCWE	Monique Frize	08:50 - 09:10	L'état des choses aux USA	Paula Leventman
09:30 - 10:30	FSI/WISE: mise à jour - régions	Chaires régionales	09:10 - 09:30	NCDEAS - se tournant vers l'avenir	Claude Laguë
10:15 ...	PAUSE-CAFÉ*		10:15...	PAUSE-CAFÉ*	
10:30 - 10:50	Ingénieurs Canada (Task Force / WIEAG)	Chantal Guay	09:30 - 11:00	Les groupes de travail formulent les recommandations pour la prochaine décennie	
10:50 - 11:10	CRSNG/NSERC	I.Blain/E.Megyeri-Lawless	11:00 - 12:00	<b>PLÉNIÈRE</b>	Modératrice - M. Frize
11:10 - 11:30	UNESCO	Axel Meisen		Les groupes de travail présentent leurs recommandations :	
11:30 - 12:00	L'auditoire s'exprime...	Modératrice: M.Frize		<b>Jeunesse et universités</b>	
12:00 - 13:00	LUNCH D'AFFAIRES*		12:00 - 13:00	LUNCH D'AFFAIRES*	
13:00 - 13:30	Le rapport GRUOFI/UOWERG	Ruby Heap	13:00 - 15:00	Les groupes de travail formulent les recommandations pour la	
14:45...	PAUSE-CAFÉ*		14:45...	PAUSE-CAFÉ*	
13:30 - 15:30	Les 6 groupes travaillent Cf. <i>nota</i>		15:00 - 16:30	<b>PLÉNIÈRE</b>	Modératrice - M. Frize
15:30 - 17:00	Les groupes de travail présentent	Modératrice - M. Frize		Les groupes de travail présentent leurs recommandations :	
				<i>Milieus de travail, associations, organismes subventionnaires</i>	
17:30	Pre-dinner reception at the NOVOTEL		16:30 - 16:45	Mots de la fin	
18:00	Souper-conférence au Novotel			NOTA: libre pour le repas du soir	

**Nota: voir l'annexe C pour la liste des présentations, les sommaires et les notes biographiques.**



## PROCESS

As not all participants had the same prior experience or knowledge of the issues to be discussed, it was decided that a list of questions would be developed to guide group discussions. Groups were in fact pre-arranged to bring together the widest representation of interest, and experience and knowledge of the issues at hand.

From the start, the enthusiasm was palpable, relentless as we moved from one group to another to monitor discussions. It was clear that participants were eager to bring to the table their particular experience and knowledge, listening intently to what was being said by individuals from quite different milieux, comparing, assessing, extrapolating, envisioning, and devising a blueprint for the future. This gave rise to 25 new recommendations, 3 of which were chosen as top priority; the latter were officially announced in a press release in July.

The questions (Appendix D) designed to frame the discussions proved helpful in producing the desired outcomes; complemented by the participants' enthusiasm and total involvement with these issues, these questionings ensured that the recommendations formulated at the end of the process would be rooted in reality as well as in optimism for the future. The fact that the questions were sent out a week before the workshop also proved useful as the thinking process for many had begun much before the issues were actually discussed. Again, the questions were there to guide discussions, and those who wished a different path were welcome to do so. All in all, this simple process seemed the right one for the short two-day intense discussions.

## TOP 3 PRIORITY RECOMMENDATIONS

The CCWE<sup>+20</sup> April 2011 national workshop brought together key stakeholders from national and international organizations and associations, and decision-makers from industry, academia, and granting councils, to develop strategic recommendations to shape the future role and participation of women in the engineering profession. Over seventy individuals (Appendix B - List of participants) attended the workshop and participated in discussions focussed on CCWE's original report: What has happened in the past 20 years? What has worked and not worked to increase the participation of women in the engineering profession? The discussions then moved to what needs to be done in the next 5 to 10 years to reverse the recent decline in women's participation in engineering study programs. Twenty-five new recommendations (Appendix E) aimed at youth, universities, associations, workplaces and granting agencies were formulated during two days of intense group discussions. Each recommendation comes with a "*how to*" achieve the proposed goal, and with a list of governing bodies and individuals most apt to bring these goals into reality. Participants voted and reached a consensus on the 3 top priority recommendations which are:

### TOP PRIORITY RECOMMENDATION 1

**WHAT:** Communicate a clear and exciting brand image of engineering that appeals to students from pre-school to high school, and their parents, through contests, social media, films, television, and books.

Currently, only 2.6% of young women in high school express interest in engineering. The goal is that 25% of young women will show an interest in engineering programs by 2016 and 30% by 2020.

#### HOW:

- Mobilize the participation of young people - high school students, art students, students in general - through competition by offering incentives such as meaningful prizes - reasonable cash value, scholarships, iPods, iPads etc:
- The competitions would first be regional and build into national competitions. Schools will be attracted to this – possibly teachers assigning class projects to teams participating in the competition; this would occur in the university setting as well, potentially for film class, art study class, and sociology - it would present how "Engineers Serve The World";



- Celebrate success stories of women engineers (posters, websites AND Web 2.0 more effective – Facebook, YouTube, chats) to change the introverted style of engineering, showcase careers, life of an engineer (e.g. Corinne Jetté Mount Plaisant's Aboriginal Access to Engineering):  
<http://www.nativeaccess.com/>;
- Alumni network could do job shadowing to introduce students (Grades 10-12) to engineering and its potentialities, and thereby attract young people to engineering.

## WHO:

- Engineers Canada (EC), Canadian Engineering Memorial Foundation (CEMF), constituent associations of Professional Engineers, Women in Science and Engineering Advisory Group (WIEAG), Government Liaison Program (GLP), and other engaged organizations and stakeholders.
- National Council of Deans in Engineering and Applied Science (NCDEAS) could work together with student organizations, EC, the CWSE, and the Associations of Consulting Engineers (for funding) and Industry.
- Youth serving organizations who have audiences of youth engaged and who are in the best position to mobilize youth to participate in the challenge and then promote these branding tools/resources. This could include schools and science, engineering and technology outreach organizations like Actua and Shad Valley.

**END RESULTS:** *a. A pool of materials that can be used for brand image in the media b. Students, especially girls and young women, get excited, interested, and engaged in engineering. They learn about the field and career opportunities of an engineer and what engineers do.*

## **TOP PRIORITY RECOMMENDATION 2**

**WHAT:** Enhance the knowledge of engineering amongst teachers, counselors, parents, on the nature of engineering careers, outlining the steps required to get into an engineering program and providing activities and tips on how parents can encourage their daughters to consider such a career.

### **HOW:**

- Modeled after the UBC program, develop a professional development event for teachers/counselors to enhance their knowledge of engineering;
- Students in teacher training programs should be learning about engineering - a prime time to get future educators interested in this - therefore partnership should include Faculties of Education;
- Licensing bodies for teachers of the provinces and territories should add an engineering module as they determine the required additional course offerings for teachers to maintain their licenses;
- Prepare hands-on classroom activities teachers can easily carry out, and
- Partner with existing successful outreach programs like SHAD Valley's summer internships for grade 10 and 11 high school girls, Actua, Engineers-in-the-Classroom, and Professional Education Associations special programming;
- Outreach and role modeling in Grades 3-5, Grades 6-8, Grades 9-12 (avoid gaps); add a mentoring component for older students. A Canada-wide approach ensuring that we are not missing groups (i.e. French Canada, non-Quebec female students);
- Create resources for parents that promote engineering as a great career for their daughters with specifics about the nature of engineering careers, outlining the steps required to get into an engineering program and providing activities and tips for how parents can encourage their daughters to consider careers in engineering;
- NCDEAS to establish adequate resources (financial and HR) to ensure universities continue to play an active role in supporting effective outreach initiatives to youth that promote engineering (such as Actua, Shad and others);
- Full review and promotion of best practices catalogued in a central depository i.e. A list serve that sends new ideas to those registered.

**WHO:** Engineers Canada, Engineering Schools, Departments of Education, Government Liaison Program (GLP), Women in Science and Engineering Advisory Group (WIEAG), National Council of Deans in Engineering and Applies Science (NCDEAS), universities, and other engaged organizations and stakeholders.

### TOP PRIORITY RECOMMENDATION 3

**WHAT:** Enhance the image and the structure of engineering programs to attract a more diverse group of students, with the aim of achieving 25% in undergraduate enrolment of women students by 2016 and 30% by 2020 while statistics show current enrolment at 17.4%.

**HOW:** *The process should include broad, creative thinkers and decision-makers including women advocacy groups.*

- Reconstructing engineering programs incorporating and truly reflecting:
  - the new accreditation attributes established by the Canadian Engineering Accreditation Board (CEAB);
  - new student learning profiles; and
  - a better understanding of the expectations of new generations of engineering students;
  - a diversity of curriculum including elements of other subject areas: arts, humanities, social sciences, business, leadership;
- Different approaches to teaching and applications of engineering – on the national and international scene.
- Adjusting the accreditation process to incorporate women's values, diversity and sustainable development;
- Launching a pilot program within leading universities (2013-2014) aimed at supporting women's values and needs, diversity, and sustainable development;
- A network of women in engineering advocates and NCDEAS to work together with the 4 pilot universities.

**WHO:** Universities, the National Council of Deans in Engineering and Applies Science (NCDEAS), Deans in each university, Engineers Canada (EC), the Canadian Engineering Accreditation Board (CEAB), and supporting organizations including student bodies, advocacy agencies, consulting engineering associations, industry, and other engaged organizations and stakeholders.

For a look at the 25 recommendations produced during this workshop do refer to Appendix E. We also invite everyone to promote CCWE<sup>+20's</sup> report available on ERI's website: [www.inweseri.org](http://www.inweseri.org).

## SPONSORS

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The Canadian Commission for UNESCO is proud to have supported INWES since the time of its foundation in 2001. Gender equality is a priority for UNESCO (United Nations Educational, Scientific and Cultural Organization) as it recognizes that the building of peace, the eradication of poverty, sustainable development and intercultural dialogue can only be achieved if women and men enjoy expanded and equal opportunities. The Commission salutes the essential work done by ERI to advance scientific careers for women, especially through this year's CCWE+20 conference, that "identified important new issues and shed new light on some old ones, and made progress in transitioning from 'chipping away at the problems' to 'cracking them'" as stated by Dr. Axel Meisen, President, Canadian Commission for UNESCO stated in his keynote address at the Conference.

The Commissions strongly believes that "The World needs Science and Science needs Women", and works in partnership L'Oréal Canada each year to award the prestigious *L'Oréal-UNESCO For Women and Science* fellowships in science and engineering. These fellowships support research and mentorships for girls who are interested in pursuing careers in science.







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## NEXT STEPS

The **CCWE<sup>+20</sup>** workshop held in Ottawa, April 29<sup>th</sup> and 30<sup>th</sup> 2011, brought together key players from a great variety of backgrounds to discuss past and present conditions that contribute to a low participation of women in the engineering profession. After two days of intense discussions, workshop participants developed 25 recommendations aimed at improving the image of engineering for girls and young women as well as the climate and curriculum to make engineering programs more appealing to women. These recommendations were also directed at developing good practices in workplaces within professional associations, granting agencies and research organisations with a view to increasing the participation of women at all levels. Each organisation and individual will focus on those recommendations that best fits their own particular environment and resources. Collaboration between individuals and organisations to make this happen will be encouraged.

Two immediate next steps were established at the close of the workshop. They are:

- Review of the recommendations by participants and selection of 3 top priorities for media release;
- Make the *Recommendations* and *final report of CCWE<sup>+20</sup>* available on the INWES-ERI website this summer.

The project was a huge success and participants were unanimous in recommending that this process be repeated in two years. It was also suggested that the *INWES-Education and Research Institute* set-up a permanent committee to continue connecting people, and to monitor progress in the implementation of new recommendations, including set timelines, metrics, and lead organisations identified for implementation. The goal is that after a year or two, the CCWE<sup>+20+</sup> be “institutionalized” and become an intrinsic part of Canadian organisations, leaders in creating women-friendly environments. The hope is that other countries adopt this model and carry-out a similar project. The *Institute* will be pleased to share its knowledge and expertise with all interested organizations and individuals. The *Institute* is also planning to organize a competition in the years to come with partners from industry to craft exciting drawing cards to engineering for the new generation of young people. We invite you to visit our website at [www.inweseri.org](http://www.inweseri.org) and to read the CCWE<sup>+20's</sup> final report.

## APPENDICES

### APPENDIX A

#### MEMBERS OF THE STEERING COMMITTEE

<b><i>Canadian Committee on Women in Engineering (CCWE) 1992</i></b>	
Frize, Monique	CCWE Chair
Davidson, Valerie	NSERC/RIM CWSE Chair-Ontario
Ella, Catherine	Canadian Council of Professional Engineers (CCPE) today's Engineers Canada
Franché, Pierre	Association of Consulting Engineers (ACEC)
Gordon, Richard A.	Canadian Manufacturers Association (CMA) today's CME
Heinke, Gary	National Committee of Deans of Engineering and Applied Sciences (NCDEAS)
Hersom, Naomi	Canadian Education Association (CEA)
Hockin, Nora	Industry, Science and Technology Canada (ISTC) – today's Industry Canada
Inch, Jeanne	CCWE Coordinator
Inkpen, Linda	Association of Community Colleges of Canada (ACCC)
Kushner, Eva	Association of Universities and Colleges of Canada (AUCC)
Laplante, Donald	Canadian Council of Professional Engineers (CCPE) today's Engineers Canada
Peach, Terry	GE Canada
Peleshok, Janice	Canadian Federation of Engineering Students (CFES)
Plouffe, Danielle	Employment and Immigration (EIC) today's HRSDC
Smith, Pamela	Canadian Association of University Teachers (CAUT)
Vivian, Paul	the SNC Group
Williams, K.F.	Canadian Council of Professional Engineers (CCPE) today's Engineers Canada

<b><i>CCWE<sup>+20</sup> - 2011</i></b>
Frize, Monique – Chair
Deschênes, Claire (AFFESTIM) – Treasurer
Plouffe, Danielle – CCWE <sup>+20</sup> Coordinator
Barot, Elisabeth – Canadian Commission for UNESCO
Davidson, Valerie – Chair for Women in Science and Engineering (Ontario)
Heap, Ruby – University of Ottawa Women in Engineering Research Group
Laguë, Claude – National Committee of Deans of Engineering and Applied Sciences
Leventman, Paula – INWES Education and Research Institute
McDill, Moyra – Canadian Academy of Engineering
McMartin, Ken – Engineers Canada
Peleshok, Janis – Medtronic
Peach, Terry – GE Corporate

**APPENDIX B****LIST OF PARTICIPANTS**

<b>Last Name</b>	<b>First Name</b>	<b>Title</b>	<b>Organization</b>	<b>Email</b>
Anderson	Debra		APEGS	<a href="mailto:tdculham@hotmail.com">tdculham@hotmail.com</a> <a href="mailto:dandersonconsulting@accesscomm.ca">dandersonconsulting@accesscomm.ca</a>
Barrington	Suzelle	Professor	McGill University	<a href="mailto:suzellebarrington@sympatico.ca">suzellebarrington@sympatico.ca</a>
Barroeta Kobles	Julieta	Student	Carleton University	<a href="mailto:jbarroet@connect.carleton.ca">jbarroet@connect.carleton.ca</a>
Bax	Janet	Program Director	Council of Canadian Academies	<a href="mailto:janet.bax@scienceadvice.ca">janet.bax@scienceadvice.ca</a>
Bissinger	Alexandra	Graduate Student	University of Ottawa	<a href="mailto:alexandrabissinger@gmail.com">alexandrabissinger@gmail.com</a>
Bisson	Barry	President	Shad Valley International	<a href="mailto:bisson@shad.ca">bisson@shad.ca</a>
Blain	Isabelle	Vice-President Research Grants & Scholarships	NSERC	<a href="mailto:isabelle.blain@nserc-crsng.gc.ca">isabelle.blain@nserc-crsng.gc.ca</a>
Bourgherara	Habiba	Assistant Professor	Ryerson University	<a href="mailto:habiba.bougherara@ryerson.ca">habiba.bougherara@ryerson.ca</a>
Boutin	Michèle	Directrice Générale	Chaires de recherche du Canada	<a href="mailto:michele.boutin@chairs-chaires.gc.ca">michele.boutin@chairs-chaires.gc.ca</a>
Bradley	Alison	Project Engineer	OPG	<a href="mailto:alison.bradley@opg.com">alison.bradley@opg.com</a>
Byrd	Mary Ann	P. Eng, FEC.	Defense Research and Development Canada Suffield	<a href="mailto:MaryAnn.Byrd@drdc-rddc.gc.ca">MaryAnn.Byrd@drdc-rddc.gc.ca</a> <a href="mailto:byrd_maryann@shaw.ca">byrd_maryann@shaw.ca</a>
Colasante	Samantha	Manager, Research and Diversity	Engineers Canada	<a href="mailto:samantha.colasante@engineerscanada.ca">samantha.colasante@engineerscanada.ca</a>

Croft	Elizabeth	NSERC/ Chair for Women in Science & Engineering, BC and Yukon	University of British Columbia	ecroft@mech.ubc.ca
Dansereau	Jean		École Polytechnique	jean.dansereau@polymtl.ca
Davidson	Valerie	NSERC/RIM Chair for Women in Science & Engineering	University of Guelph	vdavidso@uoguelph.ca
Deschênes	Claire	Professeure	Université Laval	claire.deschenes@gmc.ulaval.ca
Devereaux	Sarah	Associate, Dillon Consulting Ltd.	Engineers Nova Scotia	sdevereaux@dillon.ca
Douglas	Kim	Program officer	NSERC	kim.douglas@nserc-crsng.gc.ca
Fisher	Kila	Student	McMaster U Engineers without Borders	kylafisher89@gmail.com
Flanagan	Jennifer	President and CEO	Actua	admin@actua.ca
Frize	Monique	Chair CCWE <sup>+20</sup> and President INWES ERI		mfrize@gmail.com
Gagné	Claude	Sr. Policy Adviser	Industry Canada	claud.gagne@ic.qc.ca
Gaudet	Jeanne-d'Arc	Professeure	Université de Moncton (AFFESTIM)	jeanne.darc.gaudet@umoncton.ca
Gaulin	Hélène	Agente de programme, Sciences naturelles	Commission canadienne pour l'UNESCO	helene.gaulin@unesco.ca
Hamilton	Cord	Director - APEY	Association of Professional Engineers of Yukon	chamilton@northlandconsulting.ca
Heap	Ruby	Associate Vice President, Research	Ottawa University	rheap@uottawa.ca

Kalil	Christine	étudiante - President of WIE	WIE Concordia	christinekalil@hotmail.com, wie.president@ecaconcordia.ca
Karakatsanis	Catherine	Director - PEO	Professional Engineers Ontario (PEO) - EC	ckarakatsanis@peo.on.ca
Karimi	Dela	Engineering Lead	PepsiCo	dela.karimi@pepsico.com
Kocaeffe	Duygu	Professeure	UQAC/AFFESTIM	duygu_kocaeffe@uqac.ca
Kratsios	Melody	Sr. Vice-President	SNC-Lavalin Inc.	melody.kratsios@snclavalin.com
Lafontaine	Maryse	Traductrice	AFFESTIM	maryselafontaine@videotron.ca
Lafortune	Louise	Professeure titulaire	Université du Québec à Trois-Rivières	Louise.Lafortune@UQTR.CA
Lague	Claude	Dean Faculty of Engineering	University of Ottawa	claudelague@uottawa.ca
LeBlanc	Catherine	Étudiante	Université de Moncton	ecl4462@umoncton.ca
Leslie	Megan	Environmental Engineer	Stantec Consulting/ Engineers Canada (WIEAG)	megan.leslie@stantec.com
Leventman	Paula	Diversity Coordinator	Gordon-CenSSIS Northeastern U.	Leventman12@rcn.com
Luit	Aurélien	Étudiante MSc	École Polytechnique (Chaire MM)	aurelien.luit@polymtl.ca
Macias	Juan	General Manager	GE Digital Energy	juanE.macias@ge.com
Marsolais	Lorraine	Ing., FIC	Engineers Canada, WIEAG	marsolais.lorraine@videotron.ca
Mattson	Gail	Secretary	INWES ERI	ggmattson@comcast.net
Mavriplis	Catherine	Professor	University of Ottawa	catherine.mavriplis@uottawa.ca
McMartin	Ken	Director, Professional and International	Engineers Canada	ken.mcmartin@engineerscanada.ca

		Affairs		
Megyeri-Lawless	Eniko	Director, Research Grants, Engineering	NSERC	Eniko.Megyeri-Lawless@nserc-crsng.gc.ca
Meisen	Axel	President Canadian Commission for UNESCO Chair of Foresight	Alberta Innovates - Technology Futures	axel.meisen@albertainnovates.ca
Melvin	Lindsay	Engineering Lead	Manitoba Hydro	lmelvin@hydro.mb.ca
Ng Ain Kin	Jennifer	Education Programs	INWES ERI	jng@ieee.org
Normandeau	Kateri	Ing. M. Env., Coordonnatrice grands chantiers, Environnement, GENIVAR SEC	Genivar Sec (représente OIQ)	kateri.normandeau@genivar.com
O'Connor	Shannon	Director, IBM Canada Business Partner	IBM Canada	soconnor@ca.ibm.com
Peach	Terry	Manager, Organization and Staffing	GE Canada	terry.peach@ge.com
Peleshok	Janis	Product manager Neuromodulation	Medtronic	janis.peleshok@medtronic.com
Pellerin	Émilie	Étudiante	Université de Moncton	eep8468@umoncton.ca
Plouffe	Danielle	CCWE <sup>+20</sup> Coordinator	Consultant	dcplouffe@gmail.com
Plourde	Christine	FEC, P. Eng.	WIEAG / EC Conestoga-Rovers and Associates	cplourde@craworld.com
Rabyj	Kristina	WISE Program Coordinator	University of Saskatchewan	Prairie_WISE@cs.usask.ca / kristinarabyj@gmail.com



Sahani	Shailja	Student	York University	ssahani@yorku.ca
Sask	Kyla	Ph.D. candidate	McMaster University	saskkn@mcmaster.ca
Schuegraf	Angela	Student	Carleton University	aschuegr@connect.carleton.ca
Sharp	Rawni	Team Leader, Research Grants, Engineering	NSERC	Rawni.Sharp@nserc-crsng.gc.ca
Sissons	Crystal	Dr.	Independent researcher. UOWERG	crystal.sissons@yahoo.ca
Stadnyk	Tricia	Dr.	Université of Manitoba	stadnykt@cc.umanitoba.ca
Steel	Abigail	Dr.	Engineers Canada (WIEAG)	asteel@mun.ca
Taylor	Colette	Director - Design Engineering	AECL- Nuclear Laboratories	taylorc@aecl.ca
Vasseur	Liette	Professeure	Brock University	lvasseur@brocku.ca
Vassileva	Julita	NSERC/Cameco Chair for WISE	University of Saskatchewan	jiv@cs.usask.ca
Verrier	Louise- Michelle	Agente de programme	Chaires de recherche du Canada	louise-michelle.verrier@chairs- chaires.gc.ca
Walden	David	Secrétaire général	Commission canadienne pour l'UNESCO	david.walden@unesco.ca
Warywoda	Andrea	Student	Lakehead U.	akwarywo@lakeheadu.ca
Wells	Nicole	Student	University of Ottawa	nwell023@uottawa.ca
Wu	Sylvia	Étudiante	University of Waterloo	k3wu@uwaterloo.ca
Yoanidis	Vivian	Manager, Diversity and Resourcing Programs	Hydro One	vivian.yoanidis@hydroone.com

LIST OF PRESENTERS, ABSTRACTS AND BIOGRAPHICAL NOTES

**April 29<sup>th</sup>, 2011 – Day 1: What has been done?**

**TITLE:** CCWE Report (1992), an introduction to CCWE<sup>+20</sup> National Workshop.

**Dr. Monique Frize**

**ABSTRACT:**

A brief review of the initial cross-Canada venture in 1990's, the need to re-examine the recommendations of the *Canadian Committee on Women in Engineering* (CCWE), what has been accomplished and what remains to be done to ensure an increased participation and role of women in engineering, and the expected outcomes for the CCWE<sup>+20</sup> National Workshop.

**BIOGRAPHICAL NOTES**



**Monique Frize** is also Professor Emerita at University of Ottawa. She was a biomedical engineer for 18 years in hospitals (1971-1989) and a Professor since 1989. Monique Frize published over 200 papers in journals and conference proceedings on artificial intelligence in medicine, infrared imaging, ethics and women in engineering and science. She is Senior Member of IEEE, Fellow of the Canadian Academy of Engineering (1992), Fellow of Engineers Canada (2010), Officer of the Order of Canada (1993) and recipient of the 2010 Gold Medal from Professional Engineers Ontario and the Ontario Society of Professional Engineers. She received five honorary doctorates in Canadian universities since 1992.

Monique Frize held the national Northern Telecom/NSERC Chair for women in engineering at the University of New Brunswick between December 1989 and June 1997, then the NSERC/Nortel Chair for women in science and engineering for Ontario between July 1997 and June 2002. She was a founding member of INWES (International Network of women engineers and scientists) in 2002 and its president between 2002 and 2008. In 2007, she was a founding member of the INWES Education and Research Institute, a charity organization, and is its president since 2007. Monique has published extensively on the topic of women in science and engineering over the two last decades. Her book: The Bold and the Brave: A history of women in science and engineering was released by University of Ottawa Press in November 2009.

**TITLE:** Report to CCWE<sup>+20</sup> from the Regional Chairs for Science and Engineering.  
**Elizabeth Croft, Ph.D., P.Eng. / Julita Vassileva, Ph.D. / Valerie J. Davidson, Ph.D, P.Eng.**

## **ABSTRACT**

The Natural Sciences and Engineering Research Council of Canada (NSERC) created the program of five regional Chairs for Women in Science and Engineering (CWSE) in 1996. The mandate of this program is broad, with objectives to address both the need to encourage girls and women into science and engineering careers, and to retain women as valuable contributors to science and engineering. The Chairs are role models as well as focal points for thinking about the challenges for increasing the participation of women in science and engineering and acting more broadly. This report to the CCWE workshop presents national statistics related to the participation of women in engineering as students and professionals. It also highlights some of the CWSE activities in regions across Canada as they align with the recommendations in *More than Just Numbers* report.

## **BIOGRAPHICAL NOTES**

**Elizabeth Croft, Ph.D., P.Eng.** - received a B.A.Sc. degree in mechanical engineering in 1988 from the University of British Columbia, an M.A.Sc. degree from the University of Waterloo in 1992 and a Ph.D. degree from the University of Toronto, Ontario, Canada in 1995. At present, she is a Professor in the Department of Mechanical Engineering at the University of British Columbia, where she is director of the Collaborative Advanced Robotics and Intelligent Systems Laboratory. She received a Peter Wall Early Career Scholar award in 2001 and an NSERC Accelerator Award in 2007. Her research interests include industrial robotics, human-robot interaction, and mechatronics. She is a founding instructor of the MECH2 program, which won the 2005 ASME Curriculum development award, the 2007 UBC Alfred Scow award and the 2008 Alan Blizzard Award. In 2010, she was named as the NSERC Chair for Women in Science and Engineering – British Columbia and Yukon region.

**Julita Vassileva, Ph.D.** - As a successful computer scientist, Julita Vassileva has balanced career and family to become an international leader in her field. Julita received her Ph.D. in Mathematics and Computer Science from the University of Sofia, Bulgaria. She has worked as a research associate at the Institute of Mathematics at the Bulgarian Academy of Sciences and at the Federal Armed Forces University in Munich, Germany. She moved to Canada in 1997 and was awarded an NSERC University Faculty Award in 1999. Julita is currently a professor of Computer Science at the University of Saskatchewan and her research areas involve the areas of human issues in decentralized software environments: user modeling and personalization, designing incentive mechanisms for encouraging participation and facilitating trust in decentralized software applications, such as online communities, social networks, multi-agent

systems and peer-to-peer systems. Julita serves currently as the [ACM-W](#) Ambassador for Canada and as a director for the INWES Education and Research Institute. She has been the NSERC/Cameco Chair for Women in Science and Engineering since September 2005.

**Valerie J. Davidson, Ph.D, P.Eng.** - Valerie's academic experience includes a B.Eng. degree in chemical engineering, M.Sc. in Food Science and Ph.D. in Chemical Engineering. Currently she is a professor in the School of Engineering at the University of Guelph. Her research focus is the assessment and management of microbial risks in food systems and she acts as a consultant to industry and the FAO. In 2007 she received the Provost's Award for Innovation in Teaching and Learning. From 1990 to 1992, Valerie served as a member of the Canadian Committee on Women in Engineering. In 2002 Valerie was a co-recipient of the Canadian Council of Professional Engineers (now Engineers Canada) Award for Support of Women in Engineering, an award that recognises noteworthy support of women in the engineering profession and engineering excellence. In September 2003, Valerie was named as the NSERC Chair for Women in Science and Engineering for the Ontario region. She started a renewal term in 2008 with financial support from Research In Motion (RIM). Valerie has served as a member of the Board of Directors for the Ontario Society of Professional Engineers (2007-2010) and she is a member of the board for the WinSETT Centre.

**TITLE:** Female Representation within the Engineering Profession.

**Chantal Guay, ing., P.Eng., M.Env.**

## **ABSTRACT**

An overview of the organization's and the profession's work on attracting women to engineering careers and keeping them in the engineering workforce. This includes research being conducted regarding university enrolment and the labour market, along with the work of Engineers Canada's Women in Engineering Task Force.

## **BIOGRAPHICAL NOTES**

Chantal Guay, ing., P.Eng., M.Env, Chief Executive Officer of Engineers Canada, earned her BScA in geological engineering from Université Laval and her M.Env. from the Université de Sherbrooke. She has been leading Engineers Canada since March 2008. Before joining Engineers Canada, she was involved in municipal and office management, including the startup and growth of an environmental engineering consulting firm, and the planning, development and implementation of projects geared towards the redevelopment of brownfields in Montréal. Ms. Guay is a strong believer in sustainable engineering and giving back to her profession. She is a member of the *Ordre des ingénieurs du Québec* and Professional Engineers Ontario.

**TITLE:** Maximizing Opportunities: Increasing Women's Participation in Science and Engineering – Report on the Summit Outcomes.

Tirer le meilleur parti des occasions : accroître la participation des femmes en sciences et en génie – Rapport sur les résultats du sommet.

**Enikő Megyeri-Lawless**

**ABSTRACT**

On November 16, 2010, the Natural Sciences and Engineering Research Council of Canada (NSERC), with support from Engineers Canada and Research In Motion, brought together leaders from universities, colleges and the private sector with policy makers and students for the first “Maximizing Opportunities: Increasing Women's Participation in Science and Engineering – A Summit.” The event also saw the release of NSERC's report, Women in Science and Engineering in Canada. The goals of the Summit were to:

- examine what businesses and colleges and universities are doing to attract women to careers in science and engineering and retain them; and
- Discuss what works and outline the steps organizations should take to encourage more women to choose careers in science and engineering and retain those they hire.

The Summit's panel presentations, discussions and Ideas Lab provided a forum for sharing a wide range of current initiatives, best practices and policies. Panelists and Summit participants shared innovative ideas on how to improve current processes, policies and guidelines, as well as how to implement new ones. The Summit demonstrated the clear need for sustained efforts to foster the participation and retention of women in the fields of science and engineering.

**SOMMAIRE**

Le 16 novembre 2010, le Conseil de recherches en sciences naturelles et en génie du Canada (CRSNG) a organisé, avec l'aide d'Ingénieurs Canada et de Research In Motion, le premier sommet qui avait pour thème Tirer le meilleur parti des occasions : accroître la participation des femmes en sciences et en génie. Des dirigeants d'université, de collège et du secteur privé, des décideurs et des étudiants y ont participé. Voici les objectifs du sommet :

- Examiner ce que font les entreprises, les collèges et les universités pour inciter les femmes à entreprendre et à poursuivre une carrière en sciences ou en génie;

- Discuter de ce qui fonctionne et des mesures que devraient prendre les organisations pour encourager davantage de femmes à choisir une carrière en sciences ou en génie et garder celles qu'elles engagent.

Les présentations, les discussions et le laboratoire de brassage d'idées qui ont eu lieu pendant le sommet ont permis de communiquer une vaste gamme d'initiatives, de pratiques exemplaires et de politiques existantes. Les experts et les participants ont échangé des idées novatrices sur la façon d'améliorer les politiques, les lignes directrices et les processus actuels, ainsi que d'en mettre en œuvre de nouveaux. Le sommet a clairement montré qu'il faut déployer des efforts soutenus pour favoriser la participation et le maintien en poste des femmes dans les domaines des sciences et du génie.

### BIOGRAPHICAL NOTES

**Enikő Megyeri-Lawless** is Director, Engineering Grants, Research Grants and Scholarships Division, Natural Sciences and Engineering Research Council (NSERC). Ms Megyeri-Lawless has 13 years of working experience in a federal granting agency setting. The first few years of her working career were spent at the Medical Research Council (MRC) which later became the Canadian Institutes of Health Research (CIHR). While at CIHR, she worked with various scientific peer review committees and later on managed several partnership programs as the Deputy Director of the University-Industry Partnerships Program.

In 2005, she joined NSERC as one of the Senior Program Managers of the Networks of Centres of Excellence (NCE) Secretariat. While at the NCE, Enikő was responsible for the coordination of various NCE competitions and evaluations, and liaised with several Networks. In 2007, she became the NCE Deputy Director responsible for the NCE Networks program, overseeing a portfolio of 19 multidisciplinary networks, and all of the related peer review and evaluation activities.

In November 2010, Enikő started her current assignment within the Research Grants and Scholarships Division of NSERC, as the Director of the Engineering Grants Section. Her portfolio includes oversight of all engineering discovery grants and grant evaluation group activities, as well as special programs such as the Major Research Support (MRS) program, the G8 Multinational partnership program, and the Chairs for Women in Science and Engineering Program.

Enikő was born in Transylvania, Romania, and speaks several languages. She has studied both Chemical Engineering in Romania and Biochemistry at the University of Ottawa.

**TITLE: UNESCO and Engineering: Shaping the Future.**  
**Dr. Axel Meisen**

**ABSTRACT**

Since its foundation in 1945, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has helped to create better lives for people throughout the world creating conditions for dialogue among civilizations, cultures and peoples, based upon respect for commonly shared values. Specifically, UNESCO work has been guided by priorities on education, sustainability, gender equality and cultural diversity.

However, much remains to be done to alleviate the world's great problems, which include poverty, a lack of healthy foods and clean water, the need for affordable, clean energy and the freedom from disease and injury. It is reasoned that modern engineering practice must embrace the same priorities that are guiding UNESCO if engineering is to attract highly creative and motivated people who are capable of solving the world's great problems. UNESCO and the engineering profession therefore share strong interests. Measures of translating these interests into effective cooperation and shaping the future are explored.

**BIOGRAPHICAL NOTES**



Dr. Axel Meisen is the President of the Canadian Commission for UNESCO, the United Nations Educational, Scientific and Cultural Organization. UNESCO works to create the conditions for dialogue among civilizations, cultures and peoples, based upon respect for commonly shared values. UNESCO's unique competencies in education, the sciences, culture and communication and information contribute towards the realization of those conditions.

The Canadian Commission for UNESCO acts as a forum for governments and civil society, and mobilizes the participation of Canadian organizations and committed individuals in UNESCO's mandated areas. UNESCO is the only member of the United Nations System to have National Commissions performing this role in its Member States.

Dr. Meisen is also the first Chair of Foresight at Alberta Innovates – Technology Futures (AITF), an Alberta-based innovation corporation. In this capacity, he engages pre-eminent thinkers from Canada and around the world with a focus on defining issues where AITF can strengthen its role as a strategic agent for innovation and economic development in Alberta and elsewhere. In particular, he leads the Jasper Innovation Forum where issues of strategic global importance are annually addressed.

Dr. Meisen is a chemical engineer, with wide experience in Canada and abroad. He holds degrees from the Imperial College of Science and Technology, UK (B.Sc.), California Institute of Technology, USA (M.Sc.) and McGill University (Ph.D.). Before coming to Alberta in 2008, he served as president and vice-chancellor of Memorial University of Newfoundland (from 1999 to 2008) and as professor of Chemical Engineering and Dean of Applied Science at The University of British Columbia (from 1969 to 1999).

Dr. Meisen was selected as one of the Top 50 CEO's in Atlantic Canada in 2005, 2006 and 2007; awarded the 'Medal of Distinction' by the Government of Peru for service to that country's post-secondary education sector, and made a Fellow of the Canadian Academy of Engineering, the Canadian Institute of Chemistry and the Institution of Engineers of Ireland. He is a Member of the Order of Canada.

**TITLE:** Retracing Paths to Advance Future Journeys.

**Dr. Crystal Sisson**

## **ABSTRACT**

This presentation will describe the historical context leading up to the seminal report *More Than Just Numbers*, which, we argue, represents a major paradigm shift in Canada with respect to our understanding of the continuing underrepresentation of women in STEM. An overview of key developments following the report's publication will then follow. We will focus on the early and ongoing activism of Canadian women engineers and scientists, an important historical trend which has informed and shaped the strategies and policies developed in this country to attract and retain more women in STEM. The 2011 CCWE<sup>+20's</sup> conference illustrates their heightened sense of the complex nature of the problem as well as their firm commitment to advocate new approaches and new solutions.

## **BIOGRAPHICAL NOTES**

**Crystal Sisson** earned her Ph.D. in History from the University of Ottawa in 2008. She is an independent historian and focuses on the history of Canadian women in engineering and the women's movement. She has been a member of the University of Ottawa's Women in Engineering Research Group (UOWERG) since 2004. This group is working on an assessment engineering education and culture through an interdisciplinary examination various engineering faculties. The members of UOWERG are currently completing a manuscript based on their research findings. Crystal is also working on a manuscript of Canada's first woman engineer and feminist, Elsie Gregory MacGill.



## **April 30<sup>th</sup> – Day 2: Strategies for the next 5-10 years**

**TITLE:** Ten Years of the US National Science Foundation ADVANCE Program: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers. **Catherine Mavriplis**

### **ABSTRACT**

Since 2001, the US National Science Foundation has invested over \$130M to support projects at more than one-hundred institutions to advance women in Science and Engineering academia. The program took a decided shift from previous investments in individuals to tackle institutional transformation. Several innovative program elements have emerged to increase the participation of women, create open dialogue on diversity and change entrenched practices. Common practices, creative approaches and lessons learned will be highlighted in this presentation.

### **BIOGRAPHICAL NOTES**

Catherine Mavriplis holds a Ph.D. in Aeronautics from MIT and has worked as a professor and research scientist at several American universities as well as at the US National Science Foundation (NSF) before joining the University of Ottawa as an Associate Professor of Mechanical Engineering. She has had four US NSF ADVANCE grants to advance women in the professoriate and to leadership levels in academia. Under this funding, she has developed and run mentoring and career development workshops for over 500 pre-tenure and mid-career women in science and engineering.

**TITLE:** Women in Engineering in the United States: Overview 1990-2010.  
**Dr. Paula Leventman**

### **ABSTRACT**

Major program efforts at universities and companies in the 1990s resulted in increased number of female students and professional engineers. Examination of statistical trends shows the peak years were 2000-2002. Slight downward trends can be seen since then. New efforts in the coming years must include strong leadership by deans, professors and managers. Essential is a growing culture of diversity that emphasizes welcoming attitudes as well as mentoring and support.

## BIOGRAPHICAL NOTES



**Paula Leventman** has been Diversity Coordinator and Internal Evaluator for the NSF funded Center for Subsurface Sensing and Imaging Systems (CenSSIS) from 2000 to the present. She was assistant dean of engineering for women's projects at Northeastern University from 1982-2004. Leventman was Principal Investigator of the NSF funded *Multiple Pathways toward Gender Equity in the US IT Workforce*, 2001-05; and at the same time Principal Investigator of the NSF funded *4 Schools for Women in Engineering*, 2001-05 which involved faculty and students from NU, BU, RPI and Tufts with middle school teachers and students.

Paula Leventman also has a national reputation in social research and program evaluation. Over the last two decades, she evaluated numerous NSF supported teacher enhancement and engineering center programs. She held instructional academic positions at Boston College and Wellesley College. She is the author of *Professionals Out of Work*, Macmillan, 1981. She is currently a director and the program chair of the International Network of Women Scientists and Engineers (INWES), Education and Research Institute (ERI). Paula Leventman received an Award of Recognition "For her contributions and support to Women in Engineering and the Society of Women Engineers Student Chapter at Northeastern University" on March 12, 2011.

**TITLE:** NCDEAS: Looking into the future.

CCDISA: Ce que l'avenir nous réserve.

**Dr. Claude Laguë**

## ABSTRACT

Promotion and recruitment activities of NCDEAS member schools aimed at increasing the number and proportion of women in engineering programs at the undergraduate and graduate levels; proactive recruitment of female faculty members; advancement of female faculty members (promotion, tenure, access to academic leadership positions).

*Activités de promotion et de recrutement des écoles membres du CCDISA visant à accroître le nombre et la proportion de femmes dans leurs programmes de formation en génie aux trois cycles; recrutement proactif de professeures; progression des professeures dans leurs carrières professionnelles (promotion, permanence, accession à des postes de leaders scolaires).*

## BIOGRAPHICAL NOTES

Claude Laguë, P.Eng, ing., Ph.D. was appointed Dean of the Faculty of Engineering in August 2006. An agricultural engineer holding degrees from Université Laval and from the University of California – Davis, Dr. Laguë specializes in the engineering of agricultural machinery and manure management systems. He began his professional career as a project engineer for the consulting engineering firm Urgel Delisle et Associés. From 1989 to 1999 he held a faculty position at Université Laval, where his teaching and research activities focused on agricultural machinery engineering. While at Université Laval, Dr. Laguë also served as Vice-Dean (Research) of the *Faculté des sciences de l'agriculture et de l'alimentation* and he was the founding chair of the *département des sols et de génie agroalimentaire*. In January 2000, Dr. Laguë was appointed to the Sask Pork Chair in Environmental Engineering for the Pork Industry industrial chair at the University of Saskatchewan's College of Engineering and he served as Dean of the College between 2002 and 2006. Dr. Laguë is a registered Professional Engineer in Ontario, Québec, and Saskatchewan. He is a member of a number of engineering societies, including the American Society of Agricultural and Biological Engineers (ASABE), the American Society for Engineering Education (ASEE), and the Canadian Society for Engineering in Agricultural, Food and Biological Systems (CSBE/SCGAB). Dr. Laguë is also a member of the Club of Bologna, an international association of experts in agricultural mechanization. He received the Young Engineer of the Year and the Glen Downing awards from CSBE/SCGAB in 1998 and 2001 respectively. In 1995, the Association francophone pour le savoir (ACFAS) presented Dr. Laguë with an award for the best extension article written by a university professor. A member of the National Council of Deans of Engineering and Applied Science (NCDEAS/CCDISA) since 2002, Dr. Laguë has been chairing that organization since May 2008. In that capacity, he represents Canadian engineering schools at the Canadian Engineering Leadership Forum (CELF/FLGC).

## NOTES BIOGRAPHIQUES

*Claude Laguë, P.Eng, ing., Ph.D. a été nommé au poste de doyen de la Faculté de génie en août 2006. Un diplômé en génie agricole de l'Université Laval et de la University of California – Davis, le Dr. Laguë est un spécialiste de l'ingénierie des machines agricoles et des systèmes de gestion des fumiers et lisiers. Il a débuté sa carrière professionnelle à titre d'ingénieur de projets à l'emploi de la firme de génie-conseil Urgel Delisle et Associés. De 1989 à 1999, le Dr. Laguë a occupé un poste de professeur en mécanisation agricole à l'Université Laval où il a également agi à titre de vice-doyen à la recherche de la Faculté des sciences de l'agriculture et de l'alimentation et de directeur fondateur du département des sols et de génie agroalimentaire. En janvier 2000, le professeur Laguë devenait le titulaire de la chaire industrielle Sask Pork Chair in Environmental Engineering for the Pork Industry au College of Engineering de la University of Saskatchewan et il a occupé le poste de doyen du College of Engineering entre 2002 et 2006. Claude Laguë est inscrit aux tableaux des membres de Professional Engineers Ontario, de l'Ordre des ingénieurs du Québec ainsi que de*

*l'Association of Professional Engineers and Geoscientists of Saskatchewan. Il est membre de plusieurs sociétés d'ingénierie, y compris la American Society of Agricultural and Biological Engineers (ASABE), la American Society for Engineering Education (ASEE) et la Société canadienne de génie agroalimentaire et de bioingénierie (CSBE/SCGAB). Il fait également partie d'une association internationale d'experts en mécanisation agricole, le Club of Bologna. Il a été lauréat du prix Jeune ingénieur de l'année (1998) et du prix Glen-Downing (2001) remis annuellement par la CSBE/SCGAB. En 1995, l'Association francophone pour le savoir (ACFAS) lui a décerné le prix du meilleur article de vulgarisation scientifique rédigé par un professeur d'université. Membre du Conseil canadien des doyens d'ingénierie et de sciences appliquées du Canada (NCDEAS/CCDISA) depuis 2002, il en assume la présidence depuis mai 2008. À ce titre, le Dr. Laguë représente les écoles d'ingénierie canadiennes au sein du Forum des leaders du génie canadien (CELF/FLGC).*

**QUESTION FOR DAY 1**

**Are the issues today similar to those of 20 years ago?  
...in each of the following categories:**

**Youth – Universities – Workplaces – Associations – Granting Agencies**

**YOUTH:** Barriers in CCWE 1992 report

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

**UNIVERSITIES:** Barriers in CCWE 1992 report

- 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.

**WORKPLACES:** Barriers in CCWE 1992 report

- 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.

## ASSOCIATIONS: Barriers in CCWE 1992 report

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

## GRANTING AGENCIES: Barriers not included in 1992 CCWE report

- Gender disaggregated data on success rate by type of program are not always collected nor made available.
- Selection committees are male-dominated and some women sitting on these committees are, at times, not sensitive to gender issues.
- Although grant applications include a section on reasons why productivity may have been affected (either by maternity/parental leave, serious illness, elderly care, administration etc.), women are often reluctant to use this section because they feel that committee members will not consider this aspect seriously.
- Selection committee members often judge research proposals along the lines of traditional disciplines; applications that are multi-disciplinary or non-traditional, often preferred by women, can be judged negatively and thus rejected.
- Nominations by universities for Chairs, awards, or prizes have often excluded women, i.e. 19 Canada Research Chairs went to 19 men in 2010.

## QUESTIONS FOR DAY 2

### YOUTH

1. What are the expectations and aspirations of today's young people?
2. How do today's youth engage in science and engineering?
3. How should we adjust our teaching methods in science and technology for the K-12 and CEGEP student populations?

## UNIVERSITIES

1. How can we improve outreach activities so as to increase the enrolment of under-represented groups in engineering?
2. How do we improve the image of engineering as a profession that benefits society as a whole?
3. How do we dispel entrenched, hero-style and geek-style engineering myths and replace with team-building, collaborative reality?
4. Would teaching *professionalism* to engineering students in first year help to address inappropriate behaviour?
5. How can the curriculum and climate become more women-friendly?
6. Will the new Canadian Engineering Accreditation (CEAB, BCAPG) approach accommodate the Workshop recommendations on curriculum and teaching style?
7. How can we support parenting by students, faculty members and staff?
8. How do we develop the leadership potential of women?

## WORKPLACES

1. How to stem the tide women leaving the profession?
2. How do we foster an inclusive approach in industry and government?
3. How will employers of engineers commit to creating a workplace culture that allows flexibility?
4. How to support women in mid-career or in career breaks through effective career planning?
5. How do we develop the leadership potential of women?

## ASSOCIATIONS

1. How will your engineering associations foster a women-friendly climate and environment?
2. How will associations recognize the unique contributions of women?
3. How will the associations improve the image of engineers in Canadian society?

## GRANTING AGENCIES

1. What strategic outlook and positioning could granting agencies adopt to support women and other underrepresented groups, and what programs could they put into place to this end?
2. Are all documents issued by agencies gender inclusive?
3. Is gender sensitivity training mandatory for women and men on selection committees and on staff?
4. How will the selection process take into account the temporary lower productivity of persons who request special consideration for maternity or parental leave, serious illness, elderly care, administration etc?
5. How can agencies improve gender disaggregated data they collect on the success rates for all types of grants, awards, scholarships, and prizes?





## RECOMMENDATIONS

*The Canadian Committee on Women in Engineering - CCWE<sup>+20</sup>*

**National Workshop held in Ottawa April 28 and 29, 2011**

*RECOMMENDATIONS – GROUPS 1-5*

*Le Comité canadien des femmes en ingénierie - CCFI<sup>+20</sup>*

**Atelier national tenu à Ottawa les 28 et 29 avril, 2011**

*RECOMMANDATIONS DU GROUPE 6*

## RECOMMENDATIONS OF THE CCWE<sup>+20</sup> NATIONAL WORKSHOP

Developed by the 72 participants representing youth, universities, associations, workplaces, and granting agencies.

<b><i>ISSUES – same as in 1992</i></b>	<b><i>ISSUES –NEW</i></b>
<p><i>All old issues are still with us, some changed slightly with technology and perspectives, yet more work needed to address them.</i></p> <ul style="list-style-type: none"> <li>▪ Primarily, lack of understanding of what engineers do and misconceptions about engineers:               <ul style="list-style-type: none"> <li>▪ There are still teachers and counselors who do not know what engineers really do;</li> <li>▪ Not blatant discouragement so much as lack of knowledge or misconceptions on engineering which results in discouragement;</li> <li>▪ Lack of role models – they might know an engineer, but not what engineers do.</li> </ul> </li> <li>▪ Stereotyping – peer pressure that geeks and nerds are not cool;</li> <li>▪ Families (mothers especially) play an enormous role in establishing expectations in education;</li> <li>▪ Not enough presence in media, film, fiction of engineer-heroes/heroines.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Media/MTV/Disney/Digital culture promotes “princess” behaviour(the “princess syndrome”, the “millennium girls”, and millennial attitudes);</li> <li>▪ Lack of strong curriculum and delivery of foundation courses in science and math in the schools and so, high school students are not prepared to go into engineering(<i>some strongly disagree</i>);</li> <li>▪ Strict requirements for science and math courses during high school are required to qualify for entry into science and engineering in college; wrong choices in 9<sup>th</sup> grade can eliminate options later on. Family and counselors are often not aware of the course requirements for entry into engineering faculties;</li> <li>▪ Non-conventional students need a bridge to get caught up or compensate with remedial coursework;</li> <li>▪ Engineering is not perceived by youth as a career that helps and serves society. Girls are attracted to helping careers, and interested in sciences that have clear social impact (bio, medical, environmental), along the caring, nurturing dimension.</li> </ul>

## YOUTH

### RECOMMENDATION 1

**WHAT:** Communicate a **clear and exciting brand image** of Engineering that appeals to students from pre-school to high school and their parents, through contests, social media, films, TV and books.

Currently, only 2.6% of young women in high school express interest in engineering. The goal is that 25% of young women will show an interest in engineering programs by 2016 and 30% by 2020.

#### HOW:

- Mobilize the participation of young people - high school students, art students, students in general - through competition by offering incentives such as meaningful prizes - reasonable cash value, scholarships, iPods, iPods ..
- The competitions would first be regional and build into national competitions. Schools will be attracted to this – possibly teachers assigning class projects to teams participating in the competition; this would occur in the university setting as well, potentially for film class, art study class, and sociology - it would present how “Engineers Serve The World”;
- Celebrate success stories of women engineers (posters, websites AND Web 2.0 more effective – Facebook, YouTube, chats) to change the introverted style of engineering, showcase careers, life of an engineer (e.g. Corinne Jetté Mount Plaisant’s Aboriginal Access to Engineering): <http://www.nativeaccess.com/>;
- Alumni network could do job shadowing to introduce students (Grades 10-12) to engineering and its potentialities, and thereby attract young people to engineering.

**WHO:**

- Engineers Canada (EC), Canadian Engineering Memorial Foundation (CEMF), constituent associations of Professional Engineers, Women in Science and Engineering Advisory Group (WIEAG), Government Liaison Program (GLP), and other engaged organizations and stakeholders.
- National Council of Deans in Engineering and Applied Science (NCDEAS) could work together with student organizations, EC, the CWSE, and the Associations of Consulting Engineers (for funding) and Industry.
- Youth serving organizations who have audiences of youth engaged and who are in the best position to mobilize youth to participate in the challenge and then promote these branding tools/resources. This could include schools and science, engineering and technology outreach organizations like Actua and Shad Valley.

**RECOMMENDATION 2**

**WHAT: Enhance the knowledge** of engineering of teachers and counselors, and parents. **HOW:**

- Modeled after the UBC program, develop a professional development event for teachers/counselors to enhance their knowledge of engineering;
- Students in teacher training programs should be learning about engineering - a prime time to get future educators interested in this - therefore partnership should include Faculties of Education;
- Licensing bodies for teachers of the provinces and territories should add an engineering module as they determine the required additional course offerings for teachers to maintain their licenses;
- Prepare hands-on classroom activities teachers can easily carry out, and

- partner with existing successful outreach programs like SHAD Valley's summer internships for grade 10 and 11 high school girls, Actua, Engineers-in-the-Classroom, and Professional Education Associations special programming;
- Outreach and role modeling in Grades 3-5, Grades 6-8, Grades 9-12 (avoid gaps); add a mentoring component for older students. A Canada-wide approach ensuring that we are not missing groups (i.e. French Canada, non-Quebec female students);
- Create resources for parents that promote engineering as a great career for their daughters with specifics about the nature of engineering careers, outlining the steps required to get into an engineering program and providing activities and tips for how parents can encourage their daughters to consider careers in engineering;
- NCDEAS to establish adequate resources (financial and HR) to ensure universities continue to play an active role in supporting effective outreach initiatives to youth that promote engineering (such as Actua, Shad and others);
- Full review and promotion of best practices catalogued in a central depository i.e. a list serve that sends new ideas to those registered.

**WHO:** Engineers Canada, Engineering Schools, Departments of Education, Government Liaison Program (GLP), Women in Science and Engineering Advisory Group (WIEAG), National Council of Deans in Engineering and Applied Science (NCDEAS), universities, and other engaged organizations and stakeholders.

## UNIVERSITIES

<b>ISSUES – same as in 1992</b>	<b>ISSUES –NEW</b>
<p><i>Progress has been made on all issues and percentages are up, yet further changes are needed primarily in the curriculum and in approaches/methods to teaching engineering. Focus on teaching vs. research is mandatory to effect positive change in this regard.</i></p> <ul style="list-style-type: none"> <li>▪ Pervasive male culture and curriculum;</li> <li>▪ Few women professors;</li> <li>▪ Few women in graduate school;</li> <li>▪ Few flexible tenure procedures or supportive policies.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Now there are options to the traditional engineering societies like Women in Science and Engineering (WISE) and Engineers Without Borders (EWB);</li> <li>▪ New accreditation requirements(2014) – must ensure women’s perspective is incorporated in the 12 new attributes;</li> <li>▪ To attract women, schools should have flexibility in accepting and supporting students with broader interests rather than focusing on a narrow set of subjects, and provide transition courses to allow them to succeed;</li> <li>▪ Need to help female faculty overcome isolation, lack of mentoring and peer-advice for career issues, invisibility (e.g. not nominated for awards);</li> <li>▪ Curriculum and program delivery should               <ul style="list-style-type: none"> <li>• reflect changing perspectives and respond to new student learning profiles i.e. children who learn with iPods, iPads and other electronics and who are continuously connected to social media;</li> <li>• appeal to the strong millennial and interest desire to <b>help</b> and to be involved in community and global change (service learning opportunities);</li> <li>• provide <b>doable</b> curriculum enhancement that provide opportunity for broad interest rather than just narrow specializations – engineering and arts, engineering and public policy, engineering and medicine, engineering and society.</li> </ul> </li> </ul>

## RECOMMENDATION 1

### WHAT:

- Increase proportion of women faculty in engineering to 25% within 5 years;
- Create Associate Dean positions for women.

### HOW :Recruitment and promotion:

- Policies in place for proactive searches – within 1 year;
- Demonstrate a proactive approach when searching for women candidates for all faculty positions;
- Increase awareness as a potential career for women through promotional activities;
- Increase the number of women adjunct professors;
- Collaborating with industry.

Support of retention of women in engineering schools: within the next 3 years

- Every school should complete a survey looking at isolation, support, harassment and other related issues, and ensure wide distribution of its results to other women.
- Every school should have a *Women in Science (WIE)* network.

## RECOMMENDATION 2

**WHAT:** Enhance the image and the structure of engineering programs to attract a more diverse group of students, with the aim of achieving 25% in undergraduate enrolment of women students by 2016 and 30% by 2020.

**HOW:** *The process should include broad, creative thinkers and decision-makers including women advocacy groups.*

- Reconstructing engineering programs incorporating and truly reflecting:
  - the new accreditation attributes established by the Canadian Engineering Accreditation Board (CEAB);
  - new student learning profiles; and
  - a better understanding of the expectations of new generations of engineering students;
  - a diversity of curriculum including elements of other subject areas (arts, humanities, social sciences, business, leadership);
  - different approaches to teaching and applications of engineering – on the national and international scene.
- Adjusting the accreditation process to incorporate women's values, diversity and sustainable development;
- Launching a pilot program within leading universities(2013-2014) aimed at supporting women's values and needs, diversity, and sustainable development;
- A network of women in engineering advocates and NCDEAS to work together with the 4 pilot universities.

**WHO:** Universities, the National Council of Deans in Engineering and Applies Science (NCDEAS), Deans in each university, Engineers Canada (EC), the Canadian Engineering Accreditation Board (CEAB), and supporting organizations including student bodies, advocacy agencies, consulting engineering associations, industry, and other engaged organizations and stakeholders.



### RECOMMENDATION 3

**WHAT:** Seize the opportunity of frosh week and other university-wide social activities to set professional standards and a climate of respect in a fun way that makes a realistic use of the ethics code – for all sciences with transferability to workplaces.

**WHO:** Deans and Faculty of universities in collaboration with the Canadian Federation of Engineering Students (CFES), and the Canadian Engineering Accreditation Board (CEAB), and other engaged organizations and stakeholders.

**HOW:** With an ethics code that

- Clearly defines professionalism in terms such as *respect for each other, integrity and honesty*;
- Is available in various formats and is interactive, for multiple uses i.e.
  - In formal presentations throughout course of the programme of studies to eliminate systemic barriers and discourage gender discrimination and harassment,
  - As official reference, and
  - In social media;
- Should be incorporated in the emerging guidelines currently being developed by the Canadian engineering accreditation board;
- Should be the official reference for when problems arise (i.e. Harassment) so that it is handled in reference to it the same way across the board - as it would be by a professional engineer.
- Through workshops and conferences aimed at administrative staff and decision-makers;

- Through the establishment of equity-diversity committees that can address women in engineering issues as well as sustainable development and eco-technical issues;
- Using social marketing—addressing the *what's in it for me* angle.
- Focus on the human aspect in all engineering related activities.

#### **RECOMMENDATION 4**

**WHAT:** To address structural barriers, support, and recognize the achievements of female faculty; educate the university community.

**WHO:** Deans of Engineering, Faculties.

**HOW:**

- Create targets for hiring female faculty, e.g. reaching 25% by 2016, 30% by 2020;
- Create action plans for hiring and proactively seek female candidates and encourage them to apply;
- Share information about diversity top-down using existing structures (equity committees, eco-technical issues committees), using social marketing (to address the “What is in there for me” question for everyone).

#### **RECOMMENDATION 5**

**WHAT:** Incentivize research group leaders to hire female graduate students and post-docs, and involve female faculty in major grants

**HOW:** Require that major grant proposals demonstrate how the research will advance women in engineering, e.g. by involving more female researchers, or addressing research issues related to women in engineering.

## ASSOCIATIONS

<b>ISSUES – same as in 1992</b>	<b>ISSUES – NEW</b>
<p><i>There has been progress in most areas, yet further efforts need to be deployed to get more women into leadership positions on boards and into decision-making positions in associations. Isolation continues to be a major issue.</i></p> <p><i>It has been noted that some associations have no women engineer staff.</i></p>	<p style="text-align: center;">None identified</p>

## RECOMMENDATION 1

**WHAT:** Institute diversity and newness within the 12 professional associations, more specifically, in their elected bodies, committees, and staff at leadership levels with a view to enable **change in the status quo in women's participation in engineering.**

**HOW:**

- Through Boards/Councils, hold CEOs accountable for the implementation and enforcement of new policies aimed at supporting women in engineering;
- Through equity goals built into the evaluation criteria used by CEOs to evaluate staff performance;
- Through maintaining priority funding for women in engineering amidst the many other priority areas i.e. aboriginals.

**WHO:** Provincial/Territorial Associations of Engineers, Engineers Canada (EC), Engineering Industry Associations (e.g. Association of Consulting Engineering Companies – Canada), and other engaged organizations and stakeholders.

## RECOMMENDATION 2

### WHAT/WHO/WHEN:

- That within 5 years, associations implement **succession plans** designed to increase to 30% the number of women in senior staff positions, and to 30% the number of women volunteers working on committees. Succession plans to be developed within 1 year;
- That within 3 years, professional and industry associations have designated resources and implemented **programs and policies** in order to reach 30% women in engineering by 2030.

### HOW:

- It is imperative to mobilize the small number of voting members to vote for candidates who will support the right policy changes needed to significantly increase the participation of women in engineering;
- Educate new graduates on governance processes and the importance of voting;
- Contact each association at the governance level over the next 6 months and lay out this goal.

**WHO:** Engineers Canada, professional and industry associations, and other engaged organizations and stakeholders.

### RECOMMENDATION 3

**WHAT:** Collect **more comprehensive demographic information** on women in engineering.

**HOW:** Encourage the 12 provincial/territorial associations to

- proactively gather demographic data, and to publicize widely;
- report salary survey results by gender;
- track the number of women with licenses;
- monitor the number of women leaving the profession and why.

### RECOMMENDATION 4

**WHAT:** That the *Women in Engineering Taskforce* be mandated to ask the associations leadership to adopt the 30% women in the workforce by 2030 goal at the *Engineers Canada* Board of Directors meeting May 27<sup>th</sup>2011.

## WORKPLACES

<b><i>ISSUES – same as in 1992</i></b>	<b><i>ISSUES – NEW</i></b>
<p><i>There have been significant improvement in all areas primarily due to legislation affecting government, academia and large industry; yet there is need for more improvement.</i></p> <ul style="list-style-type: none"> <li>▪ Legislation has forced changes, especially in government, academia and large industry, but not in consulting and within the union environment.</li> <li>▪ Discrimination – still there, but more subtle “one ton of feathers”; women now have more choices and opportunities to change jobs; isolation is a big issue;</li> <li>▪ Harassment – not so much from other engineers, yet still from union workers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Now more women in corporate leadership positions and as entrepreneurs with women-owned companies however, leadership training is lacking for women.</li> </ul>

### RECOMMENDATION 1

**WHAT:** Companies need to develop measures to support women who re-integrate the workplace after a long absence i.e. after maternity or parental leave.

## RECOMMENDATION 2

**WHAT:** Create and publicize a **Standard of Excellence and an Award for Diversity** in Engineering Workplaces, specifically targeted to increasing the participation of women in the profession to 30% of registered Professional Engineers by 2030.

**WHO:** Engineers Canada in collaboration with industry to

- Finalize ongoing projects i.e. The vision welcoming workplaces for women;
- Create a compelling business case for adoption by employers;
- Establish checklists, metrics (a standard exists as well as an award), and best practices using
  - a standard like ISO 9000;
  - an award for diversity in engineering workplaces (within the next 3 years);
  - an effective communications strategy with the help of the Association of Consulting Engineers (ACE), Canadian Manufacturers and Exporters (CME), CEO councils, the media and other engaged organizations and stakeholders.

## RECOMMENDATION 3

**WHAT:** Governments should create measurable targets for diversity and require that companies who apply for government funding demonstrate that they provide an equitable workplace environment. Should be a requirement for all SMEs, universities as well as large corporations, for all funding mechanisms and not only in terms of numbers.

## GRANTING AGENCIES

<b><i>ISSUES – same as in 1992</i></b>	<b><i>ISSUES – TODAY</i></b>
<i>Granting agencies were not reviewed by CCWE in 1992</i>	<p><i>Most of the barriers discussed in previous sections do not seem to be present in this milieu.</i></p> <p><i>Women however need to be encouraged to <b>self-promote</b> for prizes, awards and other formal recognition programs.</i></p> <p><i>Women often don't use the “delays” section to explain reasons for periods of lower productivity fearing that it will negatively affect their grant application.</i></p>

### RECOMMENDATION 1

**WHAT/WHEN:** In 5 years, **modify proposals for large grants** to include a section to describe in detail how research will advance women in science, research and technology.

**END RESULT:** Contribute to increasing the proportion of women in doctorate pool to 30% in the next 5 years.

### RECOMMENDATION 2

**WHAT:** That granting agencies consider **new programming** to support women faculty who wish to sustain their research activities during the critical mid-career period. More specifically,

- The *National Science and Engineering Research Council (NSERC)* should consider **expanding the women in science chair program** to add regional/assistant chairs or student chairs.



### RECOMMENDATION 3

**WHAT:** Increase scholarship and grant support at post-doc level and young faculty who often self-exclude due to false assumptions and low confidence level.

**HOW/WHEN:** within 1 year

- Clarify, publicize and standardize the use of policy regarding special circumstances (e.g. child or elderly care) that affect productivity; change the language – use the neutral “special circumstances” rather than negative “delays”.
- Provide mentorship opportunities;
- Use video/informative media clips to show how to write a good proposal or request for a grant.

### OVERALL RECOMMENDATIONS

**WHAT: Create wide-ranging incentives** to increase the participation of women in all areas through special **collaborations and partnerships** to bring ongoing and new projects to fruition.

**HOW:**

- Institute something similar to the *Maclean's* ranking to attract the best women and to raise public awareness;
- Create a new national entity with government and industry membership – to establish strong ranking criteria to assess equitable workplaces for women engineers and women faculty. This will create an incentive for universities and companies (employers in general) to meet these criteria to attract the best women faculty and students;
- That the CCWE<sup>+20</sup> recommendations be presented to the **Canadian Engineering Leadership Forum (CELF)** and that there be strong commitment by the forum to support these recommendations;
- Governments should create measurable targets for diversity and require that companies who apply for government funding demonstrate that they provide an equitable workplace environment. (Workplaces –RECOMMENDATION 3).

## NEXT STEPS

- ▶ Review of these recommendations by participants and selection of three top priorities for media release;
- ▶ Make available both the *Recommendations* and *full report of CCWE<sup>+20</sup>* on the INWES-ERI website this summer;
- ▶ Monitor set timelines, metrics, and lead organizations for implementation;
- ▶ Repeat the workshop concept every 2 to 3 years.

## NEED...

- ✓ Commitment from the top...in youth groups, universities, workplaces/industry, associations, and granting agencies;
- ✓ Action items to be implemented within the next 5 years;
- ✓ To measure metrics and monitor progress;
- ✓ To realize time is running out...to train a sufficient number of engineers and gain the valuable critical skills that women can bring to the profession. Must not miss out on a great source of innovative talent.

## GROUPE 6

Les membres viennent de différents secteurs : de groupes jeunesse, du milieu universitaire, des associations professionnelles et agences subventionnaires, et des milieux de travail et de l'industrie.

### **Les problématiques sont-elles les mêmes qu'il y a 20 ans?**

#### **CONSTATS :**

- Plusieurs études, recherches et actions provenant d'autres secteurs disciplinaires sur la question des femmes seraient aussi utiles aux femmes en génie. L'interdisciplinarité est un atout.
- Il faut faire attention aux impressions anecdotiques et aux observations non validées (par exemple, les filles sont-elles vraiment meilleures que les garçons en science ? Voir données Pisa).
- Il est nécessaire de nuancer sinon on risque de mettre en place de nouveaux stéréotypes.
- Le besoin d'obtenir des données de qualité est donc toujours actuel.

### **JEUNES (niveaux secondaire et universitaire confondus)**

#### Ce qui n'a pas changé :

- Les conseillers et conseillères scolaires semblent peu au courant de ce qu'est l'ingénierie, donc peuvent difficilement conseiller les jeunes (filles et garçons).

- 1 jeune homme sur 4 parmi les inscrits au premier cycle au Québec est inscrit en génie<sup>3</sup>. Il est donc probablement illusoire de viser une parité homme femme sans diversification du choix de carrière des hommes également. On parle davantage d'équité que d'égalité.
- Par contre, on est certain que certaines femmes qui pourraient être heureuses en génie ne s'y inscrivent pas pour toutes sortes de raisons. Entre autre facteurs, les femmes sont plus intéressées par les sciences qui peuvent avoir un impact social/sociétal : santé, biomédical, environnement, etc. que par les autres secteurs.

#### Ce qui a changé :

- Les jeunes ont une ouverture plus grande sur le monde, l'information leur parvient en temps réel, ils sont très sollicités ce qui a un impact sur leurs attentes vis-à-vis de l'enseignement.
- Les jeunes ont une plus grande ouverture, plus de respect face aux différences (religion, culture, diversité, etc.) parce qu'ils y sont confrontés davantage qu'avant.
- Ils ont plus d'outils de communication et les utilisent; les outils sont plus évolués, plus rapides.
- Ils sont en contact avec plus de modèles féminins (par ex. Julie Payette).
- Maintenant, les jeunes ne font pas qu'étudier en génie, ils ont aussi un plan de carrière.
- Les attentes des hommes changent, ils ne sont plus seulement carriéristes. Malgré leurs différences, les hommes et les femmes s'engagent davantage qu'avant dans des directions qui favorisent la famille et la vie personnelle (demandes concernant la conciliation travail-étude/famille...)
- Les pressions ont augmenté à l'université (réussite scolaire, travail-étude, pression sociale, etc.) ce qui entraîne davantage d'anxiété.

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<sup>3</sup> En 2005, au Québec, 45% des effectifs masculins au baccalauréat régulier étudiaient en sciences et génie. De plus, 28% des hommes inscrits au baccalauréat régulier à l'université étudiaient en génie. Source : Chaire CRSNG/Alcan pour les femmes en sciences et génie au Québec).

- La perception de l'écart hommes-femmes en ce qui concerne l'équité ne se retrouve pas chez l'ensemble des jeunes. Les hommes s'attendent à ce qu'il y ait des femmes dans leur classe; plusieurs femmes ne voient pas de problème d'équité.
- Par contre, certaines jeunes femmes, plus sensibilisées par la situation, peuvent être découragées par les obstacles et la perception du génie et opter pour une autre profession (auto-élimination).

### **RECOMMANDATION**

**QUOI:** Analyser les éléments qui provoquent le départ des jeunes femmes des études en génie.

**COMMENT:**

- Réaliser systématiquement des entrevues de « sortie » pour les étudiantes qui quittent les programmes de génie afin de valider les raisons motivant leur décision (manque d'argent, résultats scolaires, problème d'intégration au milieu, etc.).
- Compiler et partager les résultats.

**QUAND :** Dès maintenant.

**QUI :** Les facultés de sciences et de génie.

## MILIEU DE TRAVAIL

Ce qui n'a pas changé :

- Le **plafond de verre** existe toujours (barrière pour accéder aux postes de direction, de décision)

*Le groupe exprime plus de questions que de réponses :*

- *Reconnaît-on les styles de leadership différents ou est-ce que le leadership est toujours très stéréotypé?*
- *Reconnaît-on vraiment que la diversité ajoute à la qualité des résultats?*
- *L'attitude de compétition a-t-elle encore le pas sur l'attitude de coopération ?*
- *Est-il encore difficile pour une femme de s'exprimer et qu'on prenne en considération leur apport (idées) ?*

Ce qui a changé :

- Évolution dans certains milieux des politiques d'embauche, congé de maternité/paternité, horaire flexible, 4 jours/semaine, etc.
- Perception que l'amélioration du milieu de travail profite à tous (la génération Y exige plus).

## RECOMMANDATION

**QUOI** : favoriser la rétention des femmes en génie et dans d'autres secteurs scientifiques.

**COMMENT :** Créer une meilleure prise en compte des éléments de diversité et d'équité en entreprise :

- Encourager le développement des habiletés communicationnelles.
- Encourager l'expérience à l'international.
- Apprendre à travailler dans des équipes mixtes et diversifiées.
- Favoriser l'apprentissage (et la maîtrise) de plusieurs langues.
- Privilégier l'interdisciplinarité
- Informer sur l'existence de stéréotypes; nécessité de le redire, de le répéter.
- Mettre en place une politique d'excellence (par ex. ISO 9000) et faire en sorte que les donneurs d'ouvrage (tous les paliers de gouvernement) exigent conformité à cette norme.

**QUI / QUAND :** Les services des ressources humaines des entreprises et des autres milieux de travail.

***Nota :*** **LES ASSOCIATIONS:** *n'ont pas fait l'objet des discussions.*

## **ORGANISMES SUBVENTIONNAIRES**

**CONSTATS :**

- Une grande proportion de femmes travaille au CRSNG.
- La réalité des organismes subventionnaires a changé depuis 20 ans :
  - La situation est plus complexe ;

- La recherche universitaire est plus compétitive ;
- La « tarte » à partager n'est pas plus grosse qu'avant.
- Le CRSNG doit tenir compte de l'environnement *mondialisé* d'aujourd'hui dont la compétition est des plus acharnées.
- Une grande attention a été portée par le CRSNG depuis plusieurs années (1994) pour favoriser le succès des femmes dans leurs programmes. Plusieurs politiques positives et de conscientisation ont été mises en place.
- On ne distingue toujours pas le taux de succès des hommes et des femmes relativement à l'obtention de subventions.

## RECOMMANDATION

### QUOI :

- Allouer **temps et ressources au bon endroit** dans le but de favoriser la participation, le succès et la rétention des femmes en sciences et génie.
- Si on veut avancer et augmenter la proportion de femmes en sciences et génie, il faudrait poursuivre plus loin l'analyse sur la **place et le succès des femmes dans les programmes des organismes subventionnaires**.



**COMMENT :**

- Désagréger les résultats aux programmes des organismes subventionnaires.
- Examiner si les changements sociétaux chez les jeunes et dans la société se reflètent bien dans les actions et les programmes. Sont-ils adaptés à la situation d'aujourd'hui?
- Analyser les programmes pour débusquer les biais systémiques; utiliser des outils tels que le « *gender-based analysis* » et l'analyse différenciée, sexo-spécifique.
- Travailler en partenariat pour une meilleure synergie et de meilleurs résultats.
- Partager les résultats entre tous les organismes et avec la communauté scientifique
- Plus d'échange d'information sur les politiques, les programmes (ordres professionnels, les associations).
- Réaliser une méta-recherche pancanadienne, interdisciplinaire.

**QUI :** L'ensemble des organismes subventionnaires, les universités, les chercheurs et chercheuses spécialisés dans ces analyses.

## APPENDIX F

### EVALUATIONS

#### WORKSHOP EVALUATION FORM

	excellent	very good	average	poor
<b>Programme</b>				
Timing of activities (start, end, breaks..)				
Discussion group you were assigned to				
Choice of questions proposed for debate				
Depth of discussions				
Discussions conducted in thoughtful & objective manner				
Agreements and decisions were explicit and clear				
The <i>declaration</i> for future action plan				
<b>General Organization</b>				
Facilities: Novotel / University of Ottawa				
Food services: Novotel / University of Ottawa				
Ability of staff/volunteers to accommodate requests				
Organization/flow				
<b>Overall value</b>				
My expectations for this workshop were met <i>circle</i>	completely	adequately	partially	not at all

Brief statement regarding your experience at the workshop.
Recommendations for future workshops?
Other suggestions or comments:

## RESULTS

	Excellent	Very Good	Average	Poor	NA
<b>Programme</b>					
Timing of activities (start, end, breaks..)	3	11	18	1	1
Discussion group you were assigned to	16	14	1	1	2
Choice of questions proposed for debate	13	17	3		1
Depth of discussions	13	14	7		
Discussions conducted in thoughtful & objective manner	10	19	5		
Agreements and decisions were explicit and clear	6	13	11	1	3
The <i>declaration</i> for future action plan	3	8	5	1	17
<b>General Organization</b>					
Facilities: Novotel / University of Ottawa	9	15	6	1	3
Food services: Novotel / University of Ottawa	7	17	7	2	1
Ability of staff/volunteers to accommodate requests	13	16	4	1	0
Organization/flow	6	16	9	2	1
<b>Overall value</b>	<b>Completely</b>	<b>Adequately</b>	<b>Partially</b>	<b>Not at all</b>	
My expectations for this workshop were met	13	16	4	0	

## BRIEF STATEMENT REGARDING YOUR EXPERIENCE AT THE WORKSHOP

- “The presentation repeated a lot of the same information. Information should’ve been condensed and presented as one presentation and use the time for group discussion.”
- “Good idea to bring in diverse group (industry, government, students) to exchange ideas.”
- “Overall was a very informative and good experience.”
- “Great workshop! More students should be involved (i.e. from more universities and years of study to have more insight on what today’s and tomorrow’s youth need and want out of engineering). ”
- “Really enjoyed it. Was so good to be invited and am happy many different perspectives were included e.g. Students, grad students etc.”
- “Look forward to receiving the electronic report to go over and share.”
- “Some very impressive attendees.”
- “Having a mix of people in groups was good.”
- “Great information sharing and discussion overall.”
- “A lot of time was spent discussing Grant issues, which were irrelevant to me and therefore, non-value added. Should have been an opportunity for those not affected to have alternate discussion.”
- “I loved the workshop. Brought several new ideas to mind regarding issues and foresight of what to expect in my future career.
- “Good cross section of participants who are obviously interested in the issue.”
- “Great discussions. Thanks for following up.”
- “While I appreciate keeping the costs down by using space out of the university, a classroom setting with desk space to permit note taking by all participants would have been appreciated.”
- “Time management seemed to be an issue.”
- “Good discussions but groups were on the large side to get greater depth. My group had good facilitators.”

- “Too many questions in discussion groups, means of bring discussion group findings forward was awkward.”
- “Did not keep to schedule.”
- “Maybe 2.5 days.”
- “Great!”
- “Excellent opportunity to network!”
- “Good initiations put forward.”
- “Renewed my interest in women in engineering issues.”
- “Would like to see more university leaders and industry leaders at the table; more men and decision makers need to be present.”
- “Enjoyed the networking piece and love the idea of multidisciplinary approach.”
- “This workshop was great; I enjoyed hearing women’s stories (which were similar to mine).”
- “I truly believe that we have made realistic solutions, I’m excited to see how these recommendations will be implemented.”
- “The workshop was an inspiration to the type of engineering career I would like to have after university. It also gave me perspective to the types of actions I can personally take to promote women in engineering. ”
- “Discussion opportunities/mix of participants on teams were excellent.”
- “Just meeting like-minded women who have had the same experiences I have. Sounds silly, but I often thought “it was just me” feeling/perceiving things until now! This really helped increase self-confidence. Thanks! ”
- “I really enjoyed the workshop. The networking opportunities were the most useful for me. The significant amount of time spent discussing universities and granting agencies was not meaningful to me.”
- “Very good and excellent in many ways.”
- “Possibly have an active networking period before dinner.”
- “Appreciate 20 year follow-up.”
- “Nice Claudette tribute in history from Crystal.”

- “Good cross-section of attendees.”
- “I thought that the group discussions were excellent, that the presentations were interesting and informative. I really enjoyed learning about the issues facing women in engineering. Also it was a bit of an eye opener about my own experiences.”

## RECOMMENDATIONS FOR FUTURE WORKSHOPS

- *“Reduce presentation time and present information in a more concise manner.”*
- *“Have a more dynamic way to bring conclusions to the table. Maybe record them in an online document in blocks while the discussion occurs so they don’t have to be retyped twice, this would save time.”*
- *“During discussions, there were so many terms and separate discussions on associations that not everybody is familiar with. I suggest a small explanation”*
- *“More students.”*
- *“Bilingual!”*
- *“It would be nice to have more industry people do presentations! (to many academics which over represents the women engineering workforce).”*
- *“Just keep meeting and working towards tackling this important issue.”*
- *“Even more people/decision makers (if possible).”*
- *“Having schedule (readable), background documents, and discussion questions at least a week before would be good (electronically).”*
- *“Put info like map, schedule, and goals on website.”*
- *“Senate room was not optimal for this type of event.”*
- *“It would be beneficial to have this type of meeting regularly – perhaps bi-annual- to keep momentum.”*
- *“Longer times for discussions to allow more depth.”*
- *“Significantly more industry representatives.”*
- *“More than 2 day conference.”*

- *“Focus groups according to sector representative and interests.”*
- *“Reach out to CEO’s and managers to try to get them onboard, possibly through the Canadian Engineering Leadership Forum.”*
- *“The second day of the workshop seemed to get bogged down. I think it would have been beneficial to re-group participants to put like experiences together. Cross-experience was beneficial on the first day when looking at the broad picture but was not a benefit on the second day.”*
- *“This workshop was focused primarily on the past and the present. A look at the future would be appropriate and helpful.”*
- *“Facility with better room layout, everything in on building.”*
- *“Allow more time for discussions, plan more breaks.”*
- *“Keep group discussions shorter and more focused.”*
- *“Don’t have six group discuss the same topic (2-3 is enough).”*
- *“Have participants choose which area they want to tackle (i.e. youth, universities etc).”*
- *“Get more students to attend the workshop.”*
- *“Perhaps have different working groups each day (allow for more networking).”*
- *“Make realistic timelines (20 minutes too short).”*
- *“Don’t wait so long.”*
- *“Invite even more youth specifically sending invitations to women in engineering student groups. Their input is important.”*
- *“Suggest that the break out groups may be broken out by section and focus questions most relevant to them. Other questions could be discussed as well.”*
- *“Would have been a good idea to have another day to lengthen longer discussion periods. Too many questions for short periods.”*
- *“Dinner dragged too long.”*
- *“Breakouts send output to coordinator prior to full group discussion by email/memory stick to: send pre-read, multiple communications prior to build “team” photo all together.”*

- *“I think the group discussions should be streamlined somehow, as this seemed quite lengthy and not productive. In a more efficient way could be commencing with presenting the results. The discussion could be a bit lengthier.”*

## OTHER SUGGESTIONS OR COMMENTS

- “Very friendly people and organized! If possible, would be good to try to involve more representations from industry/government to try to implement more of the ideas.”
- “Small suggestion: supply couple pieces of papers/areas on paper for taking notes (to remember all of the great ideas!).”
- “Less/no disposable items (plates, bowls, cups, cutlery) during meals.”
- “Organizations representatives come with potential budget size to allow for realistic application of ideas.”
- “The overall follow up is great. When providing post conference info, I hope you will share the plan on how this info will be used.”
- “A smaller group needs to review the insights and recover recommendations in order to create a basis for action.”
- “Bulletin board or blog to post comments on declaration.”
- “Make better use of available technologies i.e. mobility of keyboards.”
- “Would love to attend a session on how to implement these recommendations.”
- “Excellent!”
- “In the given package of documents, include a document on all acronyms that may be used or attending the conference (provide slight description of all speakers and respective associations etc.).”
- “Stay on-time so discussions aren’t rushed/cut short.”
- “Advice facilitators on time, i.e.: time/prompt so all areas/Questions can be addressed within group.”
- “Expedite discussions by not re-writing notes; coordinate team leaders so they sit together and limit time of response to allow for more discussion as a whole group.”



- “Did very well for constraints of a 2-day workshop.”
- “Suggest than when the full group is together- all should have the same type of seating. All at a table or all in chairs – not half and half.”
- “Keep doing these conferences, keep the ideas moving, don’t wait for another 20 years.”
- “Press release.”
- “More digital.”
- “Best practises materials table.”
- “I think that more of these conferences should be held, to further advance the awareness of women in engineering and also more social media should be used to educate young women.”

## ÉVALUATIONS

## Le formulaire d'évaluation

	excellent	très bon	bon	faible
Programme				
La coordination des activités (début, fin, pauses..)				
Le groupe de discussion choisi pour vous				
Choix des questions faisant l'objet des discussions				
Qualité des discussions				
Discussions menées de façon réfléchie et objective				
Des consensus et décisions claires et explicites				
La déclaration qui mènera au plan d'action				
L'organisation en général				
Les installations : Novotel / Université d'Ottawa				
Les repas/service: Novotel / Université d'Ottawa				
La capacité du personnel à adresser vos demandes				
Organisation, fluidité et facilité				
Valeur globale de l'atelier				
Mes attentes ont été rencontrées	tout à fait	suffisamment	partiellement	pas du tout

Quelques mots sur votre expérience dans cet atelier.
Nous aimerions recevoir vos recommandations pour l'avenir.
Autres suggestions ou commentaires :

## RÉSULTATS

	Excellent	Très bon	Bon	Faible	s/o
<b>Programme</b>					
La coordination des activités (début, fin, pauses..)	3	11	18	1	1
Le groupe de discussion choisi pour vous	16	14	1	1	2
Choix des questions faisant l'objet des discussions	13	17	3		1
Qualité des discussions	13	14	7		
Discussions menées de façon réfléchie et objective	10	19	5		
Des consensus et décisions claires et explicites	6	13	11	1	3
La <i>déclaration</i> qui mènera au plan d'action	3	8	5	1	17
La coordination des activités (début, fin, pauses..)					
<b>L'organisation en général</b>	9	15	6	1	3
Les installations : Novotel / Université d'Ottawa	7	17	7	2	1
Les repas/service: Novotel / Université d'Ottawa	13	16	4	1	0
La capacité du personnel à adresser vos demandes	6	16	9	2	1
Organisation, fluidité et facilité	<b>tout à fait</b>	<b>suffisamment</b>	<b>partiellement</b>	<b>pas du tout</b>	
<b>Valeur globale de l'atelier</b>	13	16	4	0	

## QUELQUES MOTS SUR VOTRE EXPÉRIENCE DANS CET ATELIER...

- “La qualité des discussions était de très grand niveau!”
- “ Très enrichissant, ouverture sur de nouvelles interrogations et des solutions concernant le sujet.”
- “Horaire trop chargé pour 2 jours, décroître la durée et le nombre des présentations. ”
- “Super mais on doit penser que toutes les sciences ont les mêmes problèmes. Plus global. ”
- “ Échanges très riches et diversifiés. Nouveaux apprentissages. Création de réseaux pour des collaborations futures. ”
- “ Excellent! mais j’aurais apprécié que les présentations soient présentées dans un autre ordre. La meilleure présentation : Mme Paula Leventman aurait pu présenter sa conférence le 1<sup>er</sup> jour. ”
- “C’est très inspirant de rencontrer des femmes/hommes de différents milieux et régions et de travailler ensemble pendant 2 jours; cela coupe l’isolement! ”
- “ Mettre davantage de pauses, de temps pour réseauter et discuter. ”
- “ Contenu tout à fait pertinent et approprié. ”
- “Il y avait longtemps que je n’avais touché le sujet femmes de science, et c’est un peu décourageant de voir et entendre les mêmes histoires qu’il y a 25 ans; mais il y a quand même du progrès! J’aurais aimé plus de temps pour les discussions et moins pour les présentations qui se répétaient un peu entre elles et n’apportaient pas vraiment de nouvelles idées. C’était assez traditionnel comme atelier. ”

## NOUS AIMERIONS RECEVOIR VOS RECOMMANDATIONS POUR L’AVENIR...

- “Un autre atelier avant 20 ans, SVP! ”
- “ Intégrer plus d’hommes, de jeunes et de membres administratifs et des ressources humaines des entreprises. ”
- “Rencontres plus fréquentes d’un groupe consolidé (Ingénieurs Canada, CRSNG, Chaires du CRSNG). ”

- “Plus ciblé pour les groupes et un peu moins de présentations (ou moins longues). ”
- “Plus de représentation de francophones, de diversité ethnique, de jeunes ingénieures, et des minorités visibles. Séances bilingues (français/anglais). ”
- “Les comptes rendus des ateliers doivent être résumés de façon plus efficace. ”
- “ Les sujets ont été traités en proportion du temps des ateliers sur le milieu universitaire de façon très importante. Plusieurs enjeux très importants n’ont pu être discutés: gouvernement, industrie, secteur privé, etc... Ne pas présenter les résultats d’atelier devant le groupe, c’est trop long! Le focus devrait être sur les discussions /ateliers. ”
- “Avoir une meilleure diversité de participants; inclure plus d’hommes, étudiants masculins, des doyens, des dirigeants d’entreprise, des directeurs de ressources humaines, des personnes qui ont abandonné la profession d’ingénieure pour permettre de mieux nourrir le débat et de susciter des idées nouvelles. Avoir un ‘keynote speaker’ très inspirant. Avoir des exemples d’autres pays. ”

#### AUTRES SUGGESTIONS OU COMMENTAIRES...

- “Pour les repas du midi, il serait très adéquat que tous puissent manger à une table. Lors du samedi midi, le fait d’écrire un texte en présence de tous était ardu et long. ”
- “Tenir un atelier similaire en 2016 (5 ans plus tard) pour dresser le bilan des acquis et établir de nouvelles perspectives; prévoir un service de garde sur place. ”
- “Répéter cette expérience.”
- “ Débuter le colloque le jeudi soir et terminer le colloque à midi le samedi; question d’équilibrer vie – famille! Il manquait de délégués des secteurs gouvernementaux, de l’industrie et du secteur privé. ”
- “Manque de diversité des délégués - augmenter la proportion d’hommes, de représentants du gouvernement, de l’industrie, du secteur privé. ”
- “Avoir davantage d’invités /présentations de réussites dans le milieu de travail : excellence et pratiques d’excellence. ”

- “ Inviter présidents, vice-présidents des ressources humaines à présenter l'évaluation des pratiques et résultats. ”
- “ Augmenter les représentants du gouvernement, industrie, secteur privé. ”
- “ J'ai trouvé que l'atelier était très axé sur le milieu universitaire et il serait plus créatif de discuter de l'industrie, du gouvernement, etc... Il serait intéressant et plus stimulant d'utiliser des techniques de facilitation d'atelier plus professionnelles—il existe nombres de facilitateurs certifiés qui sont excellents. Les rapports de chaque groupe étaient longs et ennuyants à suivre à l'écran. On a parlé de diversité et d'inclusion, mais les francophones ne pouvaient pas s'exprimer dans leur langue, sauf pendant les ateliers...à améliorer. Le réseautage est excellent, comme d'habitude! ”

**POST- CONFERENCE COMMENTS**

- “It was a pleasure meeting you all and look forward to future collaborations.”
- “Once again thank you for including us in this workshop. It was a pleasure to participate and meet so many accomplished representatives of women in engineering.”
- “I really enjoyed participating in the CCWE<sup>+20</sup>, and I know that the work will help to advance the position of women in engineering. I look forward to seeing what will develop in the near future.”
- “I wish to compliment you (and all the organizers) on a workshop that exceeded expectations. I come back with a much better understanding of the issues, and a commitment to implement some of the actions points we discussed in my portfolio as Associate Dean Faculty Relations. One of the most important aspects of the workshop was the opportunity to hear first-hand from some female engineering students; I was most impressed by their contributions and insights.”
- “I'd also really like to thank you, Monique and all of the other organizers for putting together such a great workshop. I'm especially grateful for the wide variety of representation that was in attendance, and that I was invited as a graduate student to give my perspective. As I am finishing up my PhD and deciding between work in industry, government or academia, it was really useful for me to hear and be involved in the discussions. I also got a lot of inspiration and will continue to be involved in women in engineering groups to help tackle the many issues that still exist. I look forward to receiving the final report and hearing about the workshop in the media. Thanks again.”
- “Thanks so much to the organizing committee for taking the lead on organizing this workshop and continuing to work to try to move the cause forward!”
- “I think the university recommendations could easily pertain to college engineering technology programs as well – it is unfortunate that we did not have college representatives at the session – something to consider if this workshop is run again in 2-3 years.” – “Hydro One has partnered with four colleges so I would be happy to try to get them involved next time – just keep me in the loop.”
- “Thanks for all your hard work!”

- “Thanks for organizing such a wonderful and fruitful workshop! It was an amazing experience to meet all these successful and inspiring women engineers!”
- “Thanks. I really enjoyed the workshop”
- “Je te félicite également pour ton grand sens d’organisation. Tu as été la tête pensante. Ce fut tout un plaisir pour moi de vous aider.”
- “Thank you for inviting me to participate. It was a great honour and pleasure to work with such an esteemed and enlightened group. I learned a great deal from those two very fast paced days (And it was very fun).”
- “I would like to congratulate you on the fine workshop that you and your colleagues organized last week. It identified many important new issues as well as shed new light on some old ones. I do believe that we made some progress in transitioning from ‘chipping away at the problems’ to ‘cracking them’.”



## COMMENTAIRES POST-CONFÉRENCE

- “J’ai aussi adoré l’expérience! Les débats ont été passionnants. L’événement a été organisé avec soin et pour ça je t’en remercie. Les résultats ne sont que le reflet de l’organisation. Toutes mon admiration va aussi à Monique qui ne cesse d’apporter devant le public des questions aussi pertinentes avec autant d’énergie et de conviction. Je vous souhaite à toutes les deux un bel été et qu’il soit ensoleillé sinon qu’il le soit dans vos cœurs.”
- “Merci pour cette opportunité de contribuer. »
- “Merci encore pour tout le support lors de la conférence. Je dois dire que tout a bien été et pas mal d’interactions.”
- “Merci encore et toutes mes félicitations pour un atelier très intéressant et productif vendredi et samedi derniers.”
- “Encore une fois, merci pour l’invitation, et bravo pour l’excellent travail au CCWE<sup>+20</sup>. Je n’ai pas assisté jusqu’à la fin samedi, mais suffisamment pour me rendre compte que d’excellentes recommandations ont été formulées pour accroître la visibilité, le recrutement, la participation et la rétention des femmes en science et génie au Canada. J’aime beaucoup cette idée d’un classement des facultés de science et génie par une tierce partie (par ex., le magazine Maclean) pour leur performance en matière d’éthique, de diversité et de soutien aux enjeux du développement durable pour l’humanité au 21<sup>e</sup> siècle. J’aime aussi la recommandation que les conseils subventionnaires modifient leurs formulaires de demande de subventions pour y insérer des questions sur les politiques des universités en matière d’éthique, de diversité et de développement durable; c’est sans doute la meilleure façon d’amener toutes les universités à améliorer leur pratiques. En ce qui a trait à mon travail à Industrie Canada sur l’économie numérique, on anticipe surtout une pénurie de personnel hautement qualifié en technologies de l’information et communication. On souhaite donc augmenter la participation des jeunes et aussi des groupes sous-représentés en science et génie. Plusieurs recommandations sont très pertinentes pour les politiques d’innovation qui affectent les conseils subventionnaires et les universités. J’espère recevoir le texte des recommandations le plus tôt possible pour pouvoir les partager et m’en servir au travail.”

## LIST OF ACRONYMS

<b>Acronyms (ENG/FRA)</b>	<b>Granting Councils</b>	<b>Conseils / Organismes Subventionnaires</b>	<b>Website / site Web</b>
CFI / FCI	Canadian Foundation for Innovation	Fondation canadienne pour l'innovation	<a href="http://www.innovation.ca/en">http://www.innovation.ca/en</a>
CIHR / IRSC	Canadian Institutes of Health Research	Instituts de recherche en santé du Canada	<a href="http://www.cihr-irsc.gc.ca/e/193.html">http://www.cihr-irsc.gc.ca/e/193.html</a>
EU /	European Commission - EU	Commission Européenne	<a href="http://ec.europa.eu/index_en.htm">http://ec.europa.eu/index_en.htm</a>
NSERC / CRSNG	National Science and Engineering Research Council	Conseil de recherches en sciences naturelles et en génie du Canada	<a href="http://www.nserc-crsng.gc.ca/">http://www.nserc-crsng.gc.ca/</a>
NSF	National Science Foundation - (Advance Program)	nil	<a href="http://www.nsf.gov/">http://www.nsf.gov/</a>
RSC/SRC	The Royal Society of Canada - The Academies of Arts, Humanities and Sciences of Canada	La Société royale du Canada - Les académies des arts, des lettres et des sciences du Canada	<a href="http://rsc.ca/">http://rsc.ca/</a>
SSHRC / CRSHC	Social Sciences and Humanities Research Council	Conseil de recherches en sciences humaines du Canada	<a href="http://www.sshrc-crsh.gc.ca/">http://www.sshrc-crsh.gc.ca/</a>
UNESCO / UNESCO	Canadian Commission for UNESCO	Commission canadienne pour l'UNESCO	<a href="http://www.unesco.org/new/en/unesco/">http://www.unesco.org/new/en/unesco/</a>
	<b>Federal Government</b>	<b>Gouvernement fédéral</b>	
CMEC / CMEC	Council of Ministers of Education, Canada	Conseil des ministres de l'Éducation (Canada)	<a href="http://www.cmec.ca/Pages/splash.aspx">http://www.cmec.ca/Pages/splash.aspx</a>
CRC / CRC	Communications Research Centre Canada	Centre de recherches sur les communications Canada	<a href="http://www.crc.gc.ca/en/html/crc/home/home">http://www.crc.gc.ca/en/html/crc/home/home</a>
GSC / CGC	Geological Survey of Canada	Commission géologique du Canada	<a href="http://gsc.nrcan.gc.ca/index_e.php">http://gsc.nrcan.gc.ca/index_e.php</a>
HRSDC / HRDCC	Human Resources and Skills Development Canada	Ressources humaines et Développement des compétences Canada	<a href="http://www.rhdcc-hrsdc.gc.ca">http://www.rhdcc-hrsdc.gc.ca</a>

ISTC / IC	Industry Canada - IC (previously known as Industry, Science and Technology)	Industrie Canada	<a href="http://www.ic.gc.ca">http://www.ic.gc.ca</a>
NRCan / NRC	Natural Resources Canada (NRCan)	Ressources naturelles Canada	<a href="http://www.nrcan.gc.ca/com/">http://www.nrcan.gc.ca/com/</a>
TC / TC	Transport Canada	Transport Canada	<a href="http://www.tc.gc.ca/eng/menu.htm">http://www.tc.gc.ca/eng/menu.htm</a>
	<b>Government of Québec</b>	<b>Gouvernement QC</b>	
FQRNT	nil	Fonds de recherche sur la nature et les technologies	<a href="http://www.fqrnt.gouv.qc.ca/">http://www.fqrnt.gouv.qc.ca/</a>
MDEIE	Economic Development, Innovation and Export Trade	Développement économique, Innovation et Exportation Québec	<a href="http://www.mdeie.gouv.qc.ca/ministere/english/about-us/">http://www.mdeie.gouv.qc.ca/ministere/english/about-us/</a>
	<b>Education Sector</b>	<b>Secteur de l'éducation</b>	
CFES / FCEEG	Canadian Federation of Engineering Students	Fédération canadienne et étudiants et des étudiantes en génie	<a href="http://www.cfes.ca/">http://www.cfes.ca/</a>
CSBA/ ACCCS	Canadian School Boards Association - <a href="mailto:info@cdnsba.org">info@cdnsba.org</a>	L'Association canadienne des commissions/conseils scolaires	<a href="http://cdnsba.org/">http://cdnsba.org/</a>
IEEE	Teacher workshop - Institute of Electrical and Electronics engineers	l'appellation anglaise est utilisée	<a href="http://www.ieee.org/index.html">http://www.ieee.org/index.html</a>
NCDEAS / CCDISA	National Committee of Deans of Engineering and Applied Sciences	Le Conseil canadien des doyens d'ingénierie et des sciences appliquées	<a href="http://www.uottawa.ca/">http://www.uottawa.ca/</a>
	Polytechnique		<a href="http://www.polymtl.ca/">http://www.polymtl.ca/</a>
	"Scientifines"	"Scientifines"	<a href="http://www.scientifines.com">http://www.scientifines.com</a>
UOWERG / GRUOFI	University of Ottawa Women in Engineering Research Group	Groupe de recherche de l'Université d'Ottawa sur les Femmes Ingénieurs	<a href="http://www.arts.uottawa.ca/uowerg/">http://www.arts.uottawa.ca/uowerg/</a>
WISE	WISE : Ottawa (also Calgary, Guelph, Toronto, Victoria, Sudbury, Nfld)	nil	<a href="http://www.wise-ottawa.ca/student_branches/uo.html">http://www.wise-ottawa.ca/student_branches/uo.html</a>
WISEST	WISEST : University of Alberta	nil	<a href="http://www.wisest.ualberta.ca/">http://www.wisest.ualberta.ca/</a>
	<b>Youth</b>	<b>Jeunes</b>	
	Let's Talk Science - Ottawa	nil	<a href="http://www.letstalkscience.ca">http://www.letstalkscience.ca</a>

ACTUA	ACTUA - Science and Camping activities for youth	ACTUA	<a href="http://www.actua.ca/">http://www.actua.ca/</a>
EWB / ISF	Engineers without Borders	Ingénieurs sans frontières	<a href="http://www.ewb.ca/en/whoweare/index.html">http://www.ewb.ca/en/whoweare/index.html</a>
SHAD	Shad Valley International - Drive, Stretch and Dream	nil	<a href="http://www.shad.ca/">http://www.shad.ca/</a>
	<b>Other Organizations</b>	<b>Autres organismes</b>	
	Wired Women - National Association / Ottawa Chapter	nil	<a href="http://www.wiredwoman.com">http://www.wiredwoman.com</a>
ACCC / ACCC	Association of Community Colleges of Canada	Association des collèges communautaires du Canada	<a href="http://accc.ca">http://accc.ca</a>
ACEC / AFIC	Association of Consulting Engineering Companies - Canada	Association des firmes d'ingénieurs-conseils Canada	<a href="http://www.acec.ca/en/contact/bod.asp">http://www.acec.ca/en/contact/bod.asp</a>
AECL / EACL	Atomic Energy of Canada Ltd	Énergie atomique du Canada Ltée	<a href="http://www.aecl.ca/Default.aspx">http://www.aecl.ca/Default.aspx</a>
AFFESTIM	Association de la francophonie à propos des femmes...	...en sciences, technologies, ingénierie et mathématiques	<a href="http://www.affestim.org">http://www.affestim.org</a>
APEG	Association of Professional Engineers and Geoscientists of B.C.	nil	<a href="http://www.apeg.bc.ca/">http://www.apeg.bc.ca/</a>
AUCC / AUCC	Association of Universities and Colleges of Canada	Association des universités et collèges du Canada	<a href="http://www.aucc.ca/">http://www.aucc.ca/</a>
CAE / ACG	Canadian Academy of Engineering	L'Académie canadienne du génie	<a href="mailto:info@acad-eng-gen.ca">info@acad-eng-gen.ca</a> / <a href="http://www.acad-eng-gen.ca">www.acad-eng-gen.ca</a>
CASI / IASC	Canadian Aeronautics and Space Institute	Institut aéronautique et spatial du Canada	<a href="http://www.casi.ca/">http://www.casi.ca/</a> - <a href="mailto:casi@casi.ca">casi@casi.ca</a>
CAUT / ACPPU	Canadian Association of University Teachers	Association canadienne des professeures et des professeurs d'université	<a href="http://www.caut.ca">http://www.caut.ca</a>
CCA / CAC	Council of Canadian Academies	Conseil des académies canadiennes	<a href="http://www.scienceadvice.ca/en.aspx">http://www.scienceadvice.ca/en.aspx</a>
CCWESTT	Canadian Coalition for Women in Engineering, Science, Trades and Technology	nil	<a href="http://ccwestt.org/">http://ccwestt.org/</a>

CEA / ACE	Canadian Education Association	L'Association canadienne d'éducation	<a href="http://www.cea-ace.ca/">http://www.cea-ace.ca/</a>
CELF / FLGC	Canadian Engineering Leadership Forum	Forum des leaders du génie canadien	<a href="http://www.cfes.ca/content/canadian-engineering-leadership-forum">http://www.cfes.ca/content/canadian-engineering-leadership-forum</a>
CEMF / FCGC	Canadian Engineering Memorial Foundation	Fondation commémorative du génie canadien	<a href="http://www.cemf.ca/">http://www.cemf.ca/</a>
CME / MEC	Canadian Manufacturers and Exporters - CME (previously known as the Canadian Manufacturers' Association)	Manufacturiers et Exportateurs du Canada	<a href="http://cme-mec.ca/">http://cme-mec.ca/</a>
CRC / CRC	Canada Research Chairs (19)	Chaires de recherche du Canada (19)	<a href="http://www.chairs-chaires.gc.ca/">http://www.chairs-chaires.gc.ca/</a>
CWC / AFC	Canadian Women in Communications	Association canadienne des femmes en communication	<a href="http://www.cwc-afc.com/">http://www.cwc-afc.com/</a>
CWSE	Chair for Women in Science and Engineering	nil	<a href="http://www.carleton.ca/cwse-on/criteria.htm">http://www.carleton.ca/cwse-on/criteria.htm</a>
DAWEG	Division for the Advancement of Women in Engineering and Geoscience	nil	<a href="http://www.apeg.bc.ca/services/divisions/daweg/index.html">http://www.apeg.bc.ca/services/divisions/daweg/index.html</a>
EC / IC	Engineers Canada - EC (previously known as Canadian Council of Professional Engineers)	Ingénieurs Canada	<a href="http://www.engineerscanada.ca">http://www.engineerscanada.ca</a>
CEAB /BCPG	Canadian Engineering Accreditation Board –	Bureau canadien d'agrément des programmes de génie	
CEQB /BCCAG	Canadian Engineering Qualifications Board	Bureau canadien des conditions d'admission en génie	
WIEAG	Women in Engineering Advisory Group	nil	
INWES	International Network of Women Engineers and Scientists	nil	<a href="http://inweseri.org/">http://inweseri.org/</a>
OCEPP	Ontario Center for Engineering and Public Policy	nil	<a href="http://members.peo.on.ca/index.cfm/ci_id/31427/la_id/1.html">http://members.peo.on.ca/index.cfm/ci_id/31427/la_id/1.html</a>

OIQ	Ordre des ingénieurs du Québec	nil	<a href="http://www.oiq.qc.ca/">http://www.oiq.qc.ca/</a>
OSPE	Ontario Society of Professional Engineers		<a href="http://www.ospe.on.ca/">http://www.ospe.on.ca/</a>
WEAC	Women in Engineering Advisory Committee	nil	<a href="http://www.ospe.on.ca/weac.html">http://www.ospe.on.ca/weac.html</a>
SWE	Society of Women Engineers (USA)	nil	<a href="http://societyofwomenengineers.swe.org">http://societyofwomenengineers.swe.org</a>
WIN Global	Women in Nuclear Global	nil	<a href="http://www.win-global.org/">http://www.win-global.org/</a>