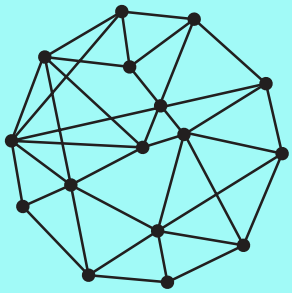

Women Entrepreneurship Knowledge Hub

Propelling Women into STEM and Skilled and Non-Traditional Professions

the prosperity project

TED ROGERS SCHOOL OF MANAGEMENT | DIVERSITY INSTITUTE

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Women Entrepreneurship Knowledge Hub

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The Women Entrepreneurship Knowledge Hub (WEKH) is a national network and accessible digital platform for sharing research, resources, and leading strategies. With ten regional hubs and a network of more than 250 organizations, WEKH is designed to address the needs of diverse women entrepreneurs across regions and across sectors. In response to COVID-19, WEKH adopted an agitator role connecting women entrepreneurs and support organizations across the country and led network calls and training sessions. WEKH's advanced technology platform, powered by Magnet, will enhance the capacity of women entrepreneurs and the organizations who serve them by linking them to resources and best practices from across the country.

With the support of the Government of Canada, WEKH will spread its expertise from coast to coast to coast, enabling service providers, academics, government, and industry to enhance their support for women entrepreneurs. Ryerson University's Diversity Institute, in collaboration with Ryerson's Brookfield Institute for Innovation + Entrepreneurship and the Ted Rogers School of Management, is leading a team of researchers, business support organizations, and key stakeholders to create a more inclusive and supportive environment to grow women's entrepreneurship in Canada.

the prosperity project

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The Prosperity Project™ is a pan-Canadian not-for-profit that was conceived by a diverse and inspirational group of 62 female leaders across the country to support the economic empowerment of women and underscore the economic importance of gender equality. The Prosperity Project developed five important Initiatives to ensure women are not forgotten during the pandemic – and are not left behind when we recover. These range from matching volunteers with non-profit organizations that offer much-needed services to women and girls to undertaking research to understand how the COVID-19 pandemic is affecting family life, work/life integration and women's responsibilities at home. Learn more: https://canadianprosperityproject.ca/programs.

The Rosie the Riveter-Inspired Initiative has a mission to inspire and empower women and girls to pursue careers in STEM, skilled trades and leadership roles to aid in Canada's economic recovery. By providing women and girls with the tools, resources, and role models they need to succeed, we can increase the number of women in high-value add jobs and sectors in STEM, skilled trades and leadership. The Rosie Initiative is grateful to Co-Presenting Partners Capital Power and Ontario Power Generation and Amplify Partner BGIS for their support.

Sponsors

The sponsors of this project include the Government of Canada, Social Sciences and Humanities Research Council.

Social Sciences and Humanities Research Council of Canada | Conseil de recherches en sciences humaines du Canada

Canada

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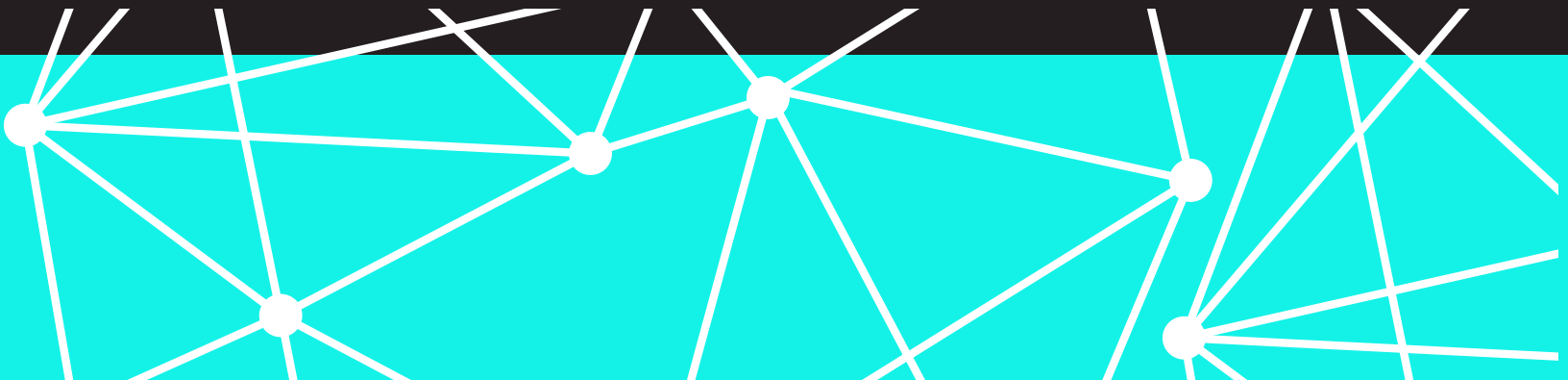


Propelling Women into STEM and Skilled and Non-Traditional Professions

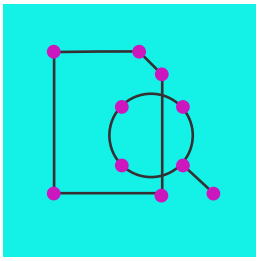
The conference "Propelling Women into STEM and Skilled and Non-Traditional Professions," was the Quebec portion of a series of virtual panels held across Canada as part of The Prosperity Project's (TPP) Rosie the Riveter initiative. The panels, which focus on women in STEM (science, technology, engineering, and math), skilled and non-traditional trades, and leadership roles, are being held in collaboration with presenting partner Ontario Power Generation (OPG) and media partner The Globe and Mail, with the support of the Women Entrepreneurship Knowledge Hub (WEKH).

Moderated by Kerlande Mibel, this event brought together experts[1] from the academic and business communities. This first conference by The Prosperity Project's Quebec team identified guiding principles, courses of action, priorities, and results-based strategies to address barriers to women in STEM fields and non-traditional occupations (Mibel, 2021, June 10). This text was written based on the panellists' oral comments during the webinar. References in the text are included in order to ensure that the original ideas are attributed to the corresponding panellist.

Women in engineering

In her opening statement, Kathy Baig, President of the Ordre des ingénieurs du Québec (OIQ), pointed out that the increase in the number of women members in the OIQ is encouraging (from 4% in 1990 to 15% today), but is not enough in this men-dominated field. The OIQ is committed to attracting and helping young women choose these interesting non-traditional careers that offer good working conditions. Emphasizing the importance of acting collectively, the OIQ has implemented various initiatives to increase the percentage of women in its ranks. In particular, the OIQ has signed up for the Canadian 30 by 30 initiative, which aims to reach the target of 30% new women registrants by 2030. Following a discussion table with universities and other stakeholders in 2016, the OIQ established a two-pronged action plan: **attracting** young girls through targeted interventions in high school and CEGEP, and **retaining** them through targeted interventions at university and with the professional community. The OIQ has also created a guide for employers to help them improve the conditions of women in their work environment. Once they have begun their careers, women face many obstacles in the workplace (lack of recognition of their skills, discriminatory bias in promotions, etc.).

1 Kerlande Mibel, Founding President of the International Black Economic Forum, President of Zwart Communication, and Visionary Regional Director of The Prosperity Project; Tania Saba, Founder and holder of the BMO Chair in Diversity and Governance, Full Professor at the School of Industrial Relations at the Université de Montréal, and Director of the Quebec and Francophone Communities of Canada Hub at the Women Entrepreneurship Knowledge Hub; Audrey Murray, President of the Commission des partenaires du marché du travail; Aïchatou Hélène Abdou, Director of the Partners Program at Poka; Maryse Lassonde, President of the Conseil supérieur de l'éducation; Nathalie de Marcellis-Warin, President and CEO of CIRANO and Full Professor at Polytechnique Montréal; Véronique Proulx, President and CEO of Manufacturiers Exportateurs du Québec and Senior Vice-President of Canadian Manufacturers & Exporters; Dr. Nadine Beauger, President and CEO of IRICor; Anne-Marie Hubert, Eastern Canada Leader and Managing Partner at EY Canada; and Isabelle Côté, President and CEO of Coffrages Synergy Formwork.



Panel 1: What Motivates Women to Study STEM and What Holds Them Back?

The presence of girls and women in STEM fields of study remains low, particularly in engineering, computer science, physics, and all the digital professions, which are actually the professions of the future (Lassonde, 2021, June 10.) Statistics show that, in correlation with their training, 42% of women who are active in the labour market are concentrated in 20 professions where women predominate and hold only about 20% of the jobs in STEM fields (Murray, 2021, June 10). Moreover, the representation of women varies significantly across engineering disciplines. For example, there are large numbers of young women in health and environmental engineering, while in software engineering, data science, and computer science, women are significantly underrepresented (de Marcellis-Warin 2021, June 10). In addition, recruiters have a hard time finding women with STEM backgrounds, particularly in computer science (Abdou, 2021, June 10).

Upstream intervention in the academic pathway

An abundance of data from the Conseil supérieur de l'éducation on how to attract girls from primary school through to university underscores the importance of beginning intervention with girls as early as primary school (Lassonde, 2021, June 10). Girls absorb society's stereotypes at a very young age. Moreover, the anxiety of teachers, both men and women, teaching science and math courses can have a negative impact on the academic progress of young girls beginning in primary school. Particular attention must therefore be paid to the way in which mathematics is taught, as young girls can decide not to take up mathematics as early as Secondary 3 (Grade 9) (de Marcellis-Warin 2021, June 10).

Intervention in the school environment is, therefore, particularly important (Lassonde, 2021, June 10). Taking action with these young girls at key points in their education is essential, as statistics show a significant gap between the number of enrollments in science at the CEGEP level and the number of enrollments in STEM fields at university. Many applicants choose to drop out of STEM studies between CEGEP and university (Murray, 2021, June 10). It is time to pass from a diagnostic phase to a solutions phase, in which it will be essential for stakeholders along the academic pathway to be involved and take responsibility.

Panel 1 was moderated by Kerlande Mibel, Founding President of the International Black Economic Forum, President of Zwart Communication and Visionary Regional Director of The Prosperity Project. In attendance were: Audrey Murray, President of the Commission des partenaires du marché du travail; Aïchatou Hélène Abdou, Director of the Partners Program at Poka; Maryse Lassonde, President of the Conseil supérieur de l'éducation; and Nathalie de Marcellis-Warin, President and CEO of CIRANO and Full Professor at Polytechnique Montréal.

Possible solutions and good practices in education

Women often consider the impact of their choices on society. Thus, it is important to emphasize early in the school curriculum that these professions are useful to society and that by entering them, young girls will be able to make a difference (de Marcellis-Warin, 2021, June 10).

The engineering school Polytechnique Montréal has instituted a mentoring program in which young women in their first or second year are tasked with passing on information about what they are doing and providing advice to young women who need guidance in their career choices.

In addition, schools offering training programmes in **non-traditional sectors** need to make statements that clearly invite girls to apply and make them feel welcome (Murray, 2021, June 10). The recruitment strategies of these academic institutions must demonstrate that a change in behaviour is actually taking place. This change requires a sustained commitment from the senior management of academic institutions as well as the faculty. In particular, institutions' management teams must allocate adequate resources, set up training programs, and develop strategies for welcoming and supporting students.

It is also essential to use measurement tools and to not underestimate the impact of targets such as those set for the construction industry (Murray, 2021, June 10). Indeed, several initiatives implemented in the construction industry have generated encouraging results in terms of women's participation rates. Such initiatives include collaborative work between the training and employment communities, the creation of incentives, and the reservation of spaces exclusively for women in training programs.

The Commission des partenaires du marché du travail set up three solutions labs made up of key players from the education, private, and community sectors to speed up this slow-moving process (Murray, 2021, June 10). The Commission ensured that the labs included representatives of diversity, because in these environments, both role models and biases have an even greater impact on community members. Innovative ideas have emerged from these labs, particularly for the educational community. For example, universities and CEGEPs need to co-operate with each other to share common tools for a movement. This unifying movement would allow women to recognize themselves in relation to the values that motivate their professional choices.

New government programs for requalification and skills upgrading in the information technology sector

In addition, the Quebec government has introduced new programs for requalification and skills upgrading, including in the information technology sector (Murray, 2021, June 10). In recent months, unemployed individuals have been eligible for weekly financial support to upgrade or requalify in this sector. This type of program provides a second chance for women to enter STEM fields.

A work–study program is available to people who have a connection with an employer that is willing to hire them on a work–study basis to give them the opportunity to gain qualifications in information technology (Murray, 2021, June 10). The challenge is to make these types of support programs known to women, especially to those who are less connected to networks. Surveys in Europe have shown that work–study placements are very popular with young women (de Marcellis-Warin, 2021, June 10).

The importance of role models

The presence in young girls' environments of women who have careers in these non-traditional professions has a positive influence on these girls' career choices (Abdou, 2021, June 10). Indeed, most university engineering students have an engineer among their family or friends, which make it easier for them to choose this career (Abdou, 2021, June 10). Thus, the presence of more women in STEM fields will, in turn, encourage girls to pursue these fields of study despite the obstacles they may face along the way (Abdou, 2021, June 10). Role models are also needed in disadvantaged environments where biases are deeply entrenched (de Marcellis-Warin, 2021, June 10).

Inspiring initiatives have been created in Canada and in Quebec to get girls interested in STEM, such as Les Filles & le code, Les Filles et les Sciences, un duo électrisant, and Hydro-Québec's Science Fair.

Companies

While some companies undervalue women's skills and avoid recruiting them, the reality is that there is currently a major demographic and digital transition taking place, with employers struggling to fill the 1,000 available jobs (Murray, 2021, June 10).

It is necessary to find a way to convince the community and change the mentality to an awareness that excellence is found everywhere, in both girls and boys (Lassonde, 2021, June 10).

Panellists' recommendations & solutions – Panel 1

Recommendations for how to attract girls to STEM, from primary school to university

> Help teachers become more comfortable teaching science and math courses, especially as there are no gender differences in learning styles.

> Explain the importance of mathematics (and pure science) to students, both boys and girls, starting in primary school, as well as how it is applied in practice and how it has a positive impact on society.

> Ensure adequate training of teachers and draw inspiration from innovative teaching practices.

> Stimulate the interest of young girls and women, welcome them, and support them at all stages of their journey, while ensuring their success at key moments in the training process.

> Demonstrate the usefulness of these professions to women early on in their careers.

Solutions to be implemented in the educational process

> Intervene early in the school environment and with parents (parents can be biased and tend to encourage girls to go into STEM less than boys).

> Find more women who have careers in these non-traditional professions to act as role models in young girls' environments.

> Find ways to promote these trades in disadvantaged areas where there are few or no women role models.

> Encourage women who are new to the field or who choose to change careers to enroll in multiple initiatives by governments, universities, and support agencies.

Recommendations at the level of non-traditional professions, a denomination that would benefit from being updated

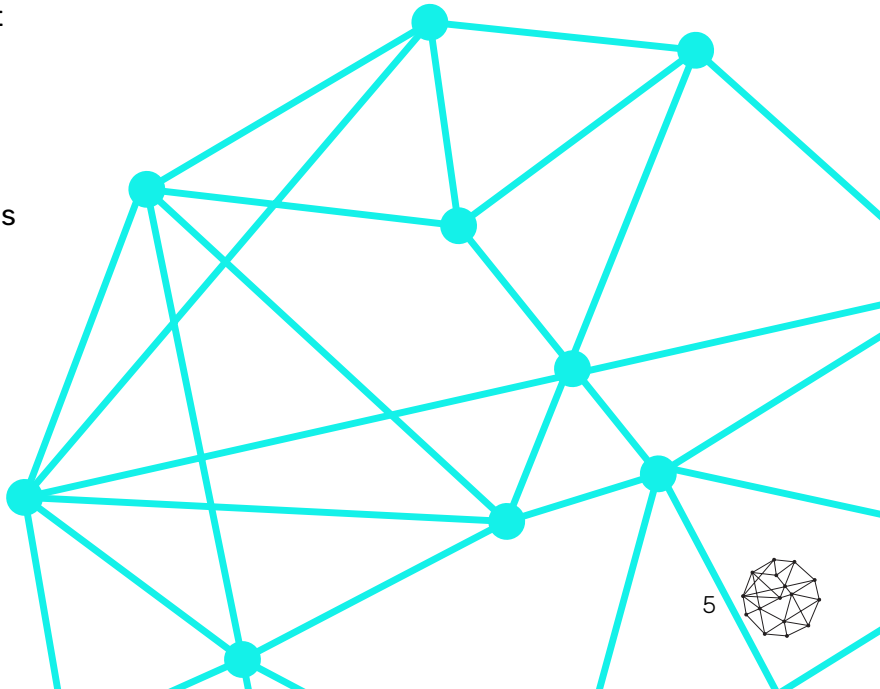
> Create incentives measures and reserve spaces for women in the training or requalification programs offered.

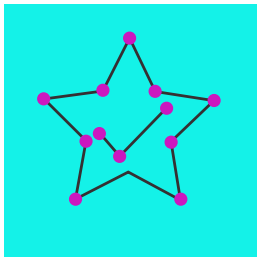
> Have dedicated incentive scholarships in digital technology so that women can access, prove themselves in and contribute to the evolution of a system.

> Connect universities and CEGEPs around a unifying movement in order to share common tools that would help girls choose STEM.

> Encourage women who aspire to STEM careers to network, both in school and upon entering the workforce.

Finally, the importance of disseminating a list of women's networks in non-traditional trades and STEM should be emphasized (Murray, 2021, June 10).





Panel 2: How Can We Attract Women to Non-Traditional and STEM Industries?

Women's entrepreneurial intentions are increasing but not really diversifying, with many women still entering traditionally women-only sectors and far fewer entering STEM professions (Saba, 2021, June 10).

The situation in the manufacturing sector

In Canada's manufacturing sector, only 27% of employees are women, and it is estimated that no more than 10–15% are on the factory floor (Proulx, 2021, June 10). The challenge is how to attract women to study in fields leading to the manufacturing sector in both plant floor and engineering and operations positions.

The perception of the sector is such that women do not consider manufacturing in their career choices, even though there are many innovative sub-sectors, such as automation, robotization, and digitization, as well as good pay at all levels and opportunities for advancement (Proulx, 2021, June 10). A survey of women in the manufacturing sector found that 32% felt the culture was patriarchal, 28% said they had left their jobs because of sexism or discrimination, and 37% said men were favoured for promotions. Based on these survey results, we can state that the manufacturing sector needs to continue its self-examination work in order to truly change these practices.

Further, the pandemic has had an impact on the retention of women in the manufacturing sector (Proulx, 2021, June 10). The participation of women in the manufacturing labour market has declined by 4.4% in Canada and 12% in Quebec. The decline in the number of women in the manufacturing sector can be explained by an increase in family responsibilities in the pandemic context (due to school and daycare closures, etc.) and the impossibility of working remotely in this sector.

Panel 2 was moderated by Tania Saba, founder and current holder of the BMO Chair in Diversity and Governance, Full Professor at the School of Industrial Relations at the Université de Montréal, and Director of the Quebec and Francophone Communities Canada Hub at the Women Entrepreneurship Knowledge Hub. The following were present: Véronique Proulx, President and CEO of Manufacturiers Exportateurs du Québec and Senior Vice-President of Canadian Manufacturers & Exporters (CME); Dr. Nadine Beauger, President and CEO of IRICoR; Anne-Marie Hubert, Eastern Canada Leader and Managing Partner, EY Canada; and Isabelle Côté, President and CEO of Coffrages Synergy Formwork.

The evolution of women in biotechnology and biomedical sciences

The issues in the biotechnology field are slightly different from those found in non-traditional environments and in scientific fields into which a large proportion of women have integrated, such as the health and life sciences (Dr. Beauger, 2021, June 10). The challenge in biotechnology remains the low number of women in management positions. When a woman succeeds in climbing the ladder, it is important to highlight her success and share it with others to pave the way for other women. It is also important to point out that although the traditional academic path is an excellent way to advance in the field, today there are alternative paths open that may equally lead to attractive professional opportunities.

The pandemic has shown us that, beyond the scientific community, research in health and life sciences is critical to the global economy and recovery (Dr. Beauger, 2021, June 10). It is therefore important to demonstrate the relevance and practicality of these fields to young girls at an early age. It is equally important to highlight examples of women's entrepreneurship in research that benefits society as a whole and that reflects both scientific rigour and women's perspectives.

The situation of women in the construction industry

The statistics for the construction sector are similar to those for the manufacturing sector, particularly in terms of the perception of the sector (Côté, 2021, June 10). The employment rate of women in the construction industry is below 2%. Increasing this rate remains a colossal task, because not only are very few women attracted to this sector, but the retention rate of women who have entered the sector is very low. Two of the main retention issues are work–life balance and lack of flexibility in scheduling. As observed in manufacturing, it is also almost impossible to work remotely in the construction sector. While approaches have been taken to offer more flexible schedules in factories, it is much more complicated to implement these on construction sites. Another major obstacle affecting the retention rate of women is inadequate behavioural competencies or "soft skills" among employees in this field. Uncivil behaviour and inadequate communication are common in this industry. Unfortunately, the training curriculum does not cover these types of skills.

There is a critical need to position women in leadership roles in many sectors and particularly in the construction industry (Côté, 2021, June 10). The feminization of leadership as well as the use of approaches based on emotional intelligence would make it possible to truly transform the culture in these environments and consequently establish a more acceptable level of civility on construction sites.

Barriers related to the underrepresentation of women in STEM sectors

The presentation of highly gendered role models in the media and the pervasiveness of bias at all ages and in all settings have a negative impact on the career choices of young girls (Hubert, 2021, June 10). A major challenge is to address these biases and provide inspirational role models in all settings, including by normalizing the presence of women in senior management positions. The underrepresentation of women in positions of power undermines young girls' confidence that they have the skills to break away from traditional paths.

Despite progress in some professional settings, a second challenge is related to organizational cultures that remain predominantly patriarchal (Hubert, 2021, June 10).

Moreover, better access to training is essential in order to give more young girls (or boys) the opportunity to study at reduced costs, especially in disadvantaged areas (Hubert, 2021, June 10).

Statistics show that women participate in the labour market and have a higher university graduation rate[2] than men (28% compared to 23% for men). At the same time, fewer women than men are choosing non-traditional academic programs (Saba, 2021, June 10).

Panellists' recommendations & solutions – Panel 2

Measures to be implemented in the area of entrepreneurship and business

> Have more women on boards and in senior management positions. Tangible progress has been made, but various measures must continue to be put in place to promote better representation of women in positions of power.

> Present women role models to whom girls and young women can relate.

> Change the notion of non-traditional occupations by implementing an outreach and communication program targeting young girls and their parents. Evaluate ways to better understand, inform, and reach them. The term "non-traditional" may be an obstacle for those who do not wish to be pioneers.

> Increase mobilization (including governments and large employers) and be more ambitious in our goals to accelerate the processes.

> Recommend diverse women from varied professional backgrounds to serve on boards of directors. Sitting on a board of directors allows for more networking, greater visibility, and the provision of more role models with whom young women can identify.

> Promote women and their initiatives in our circles and professional environments in order to support their advancement.

> Combine our traditional way of thinking with new digital technologies in order to discover unknown or unrecognized women scientists who are behind innovations. Many women in R&D invent, but only 18% of them are named on patents.

> Promote social innovation as much as technological innovation and illustrate its added value to the community.

Measures of work–family balance: adapting systems to women rather than women to systems

> Improve the work environment: provide more flexible scheduling options.

> Be open to diversity: identify it, accept it, and see the benefits it offers to both men and women, such as paternity leave, work–family balance for men, etc.

> Break down the stigma around incentives for hiring women that supposes women are hired only because of their gender and not because of their abilities and qualifications.

> Implement training in active listening and effective communication to improve behavioural skills, respect, and civility, using an entertaining and action-oriented approach.

2 Institut de la statistique du Québec. (2020, Sept.). *Les titulaires d'un grade universitaire au Québec : ce qu'en disent les données du Recensement de 2016.* [University degree holders in Quebec: What the 2016 Census data tells us]. https://statistique.quebec.ca/en/document/les-titulaires-dun-grade-universitaire-au-quebec-ce-quen-disent-les-donnees-du-recensement-de-2016

The core elements of best practice

> Transform mentalities and support the right of everyone to succeed in all aspects (establishment of parental leave).

> Collaborate with and mobilize businesses on inclusive green recovery, on a large scale (e.g., G7 initiatives will generate a profound transformation of financial markets, as they force a change in the rules of the game while promoting sustainable development, multilateralism, and the advancement of women).

> Establish benchmarks: the company must demonstrate that it is delivering on its promises and meeting requirements in terms of sustainable development and human capital. This is how significant change will take place.

> Revisit the *modus operandi* of meetings in professional settings (encourage civility, invite more people to meetings, including youth). Encourage men to make a difference.

By presenting the various initiatives, practices, and solutions that are effective in attracting young girls to non-traditional professions, our partners have clearly demonstrated the importance of mobilizing the ecosystem. Collective action is the best way to achieve a greater feminization of leadership, more inclusive organizational cultures, and a normalization of the presence of women in STEM and non-traditional occupations. It is important to remember that the commitment of men is just as important as that of women and that the contribution of women to the economy is essential.

Watch or re-watch the entire conference online at The Prosperity Project (video is in French only).