

PROFILE OF WOMEN WORKING IN THE CLEAN ENERGY SECTOR IN CANADA

Final Report

June 12, 2017

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TABLE OF CONTENTS

- 1. introduction..... 5
 - Background..... 5
 - Overview 5
 - Methodology..... 6
- 2. A Changing Energy Landscape 9
- 3. Representation by the Numbers 11
- 4. Key Challenges 21
- 5. Going **against “Tradition” with the Opportunity to Lead**..... 24
- 6. Profiles of Women Working in the Canadian Clean Energy Sector..... 32
- 7. Key Recommendations 63
- Appendix A - Consultation participants 72
- Appendix B - Further Female Inspiration 73
- References 81

EXECUTIVE SUMMARY

This report attempts to synthesize existing knowledge on the degree of women's participation in the clean energy sector. Knowledge has been gathered through a variety of methodologies including a literature review, key informant interviews, case study development and key messages from participants in a collaborative Natural Resources Canada (NRCan), Electricity Human Resources Canada (EHRC) and Women in Renewable Energy (WiRE) workshop: *Advancing Women in the Clean Energy Sector workshop* held on March 8th, 2017. The workshop was part of an NRCan symposium: *The Future of Energy: Moving Towards a Low-carbon Economy*.

REPRESENTATION BY THE NUMBERS

Despite the proportion of women in the energy industry rising and best efforts to tap into, develop and retain this cohort, the pace of improvement has been slow, with parity between men and women in the industry remaining a long way off.

Based on available global data¹, a significant underrepresentation of women has been identified with women worldwide holding approximately 20-25 percent of the workforce in the overall energy industry in advanced industrialized nations, less than six percent of these are technical positions and below one percent are top management positions in the sector. This percentage remains **lower than women's economy-wide share** in employment, which is 40 - 50% for most OECD countries.¹

These percentages (20-25%) are generally in line with data collected on the percentage of women working in the U.S. Energy Sector, annual data such as that reported in internal reports from Canadian Solar and that which has been collected independent of this study by Electricity Human Resources Canada (EHRC) through its [Labour Market Information Program](#) and [Bridging the Gap](#) project.

Data further indicates a general trend of women being employed mostly in non-technical occupations in clean energy-- in sales, followed by administrative positions and finally engineers and technicians². In absolute numbers, the largest sources of renewable energy employment for women in industrialized countries are solar photovoltaic, solar heating and cooling, wind power, biomass and biofuels sectors.³

KEY CHALLENGES

This report also identifies **factors that may either challenge or facilitate women's meaningful participation** in the sector uncovered through key informant interviews and workshop consultations which include:

- A prevalent lack of understanding and clarity about what the clean energy sector looks like (e.g. range of jobs, occupations and opportunities) which makes it difficult to navigate a clear career path.

¹ A number of key national organizations were contacted directly in an attempt to identify data specific to the Canadian labour context speaking to the representation of women in clean energy. In most cases gender disaggregated data does not exist.

- A very limited number of visible role models in the sector thus ‘denying’ women the opportunities and empowerment needed to realize their full potential
- Perceptions of a traditionally male-dominated industry and workplace culture and a perceived effort to preserve the status quo and “old boy’s network”
- Self-perceptions as well as societal perceptions, misconceptions and biases (both conscious and unconscious) of women’s roles or abilities (perpetuated by men and women alike), preventing women from “feeling bold” to pursue non-traditional roles in the clean energy sector
- Family obligations and the lack of family-friendly human resource policies and culture.

While these challenges exist, there is hope. It is believed through consultation and research as part of this project that with appropriate awareness, policy interventions, and shifts in societal attitudes there is an opportunity for increasing the participation of women within the clean energy sector in Canada – and around the globe.

OPPORTUNITY AND RECOMMENDATIONS FOR ACTION

Key findings in this report have ignited the need for unified action as we look to address the issues that hinder greater participation of women in the clean energy sector. The clean energy sector encompasses a wide range of exciting career opportunities, and women consulted have consistently expressed their desire to work in jobs that make them feel that they are contributing to the greater societal good. Those who are working in the sector are passionate about their ability to make a difference and many have already shown their support for other women as they navigate their careers by contributing their perspectives to the formulation of the following recommendations:

Recommendation #1: Collect Comprehensive Labour Market Information (LMI) & Metrics

Collecting Disaggregating Data by Gender

One of the most pressing findings and thus recommendations from this review is the need to collect labour market data specific to the clean energy sector (and its subsectors) in order to inform evidence-based policymaking and programming for improvement – a recommendation echoed by other researchers⁴ who have attempted to study employment issues in the sector. Further research aimed at documenting the gender gap in energy employment as well as informing strategies for promoting employment equity is of value. Furthermore, women’s participation rates need to be tracked to ensure progress over time is consistently measured.

Having access to sex-disaggregated employment data on specific clean energy sources would enable a better understanding of trends, as well as, the ability to shape policies and interventions for promoting employment equity and gender equality. Any efforts to engage in wide-reaching LMI data collection of the clean energy sector should be supported by a clear definition of the various sub-sectors that make up this field.

Recommendation #2: Create a Culture Shift

Shifting Societal Attitudes

There is a need not just for specific employment equity policies to address the gender gap in clean energy employment but also wider socially progressive policies as well as shifts in societal and organizational attitudes about gender roles in order for women to benefit optimally from employment in the energy sector.

While this level of shift in culture will not happen overnight –either societal or organizational – it is recommended that government and employers work to proactively develop and implement programming that attempts to change the nature of work environments that exclude women (creating a diverse team is not enough). Such programming or practices include: making a compelling business case that speaks to the economic value of gender diversity to their organization and make that effort one of the **company's top three strategic imperatives for growth**. Without a change in mindset there is no change in behaviour; promote gender awareness training for managers to deepen culture change; and engage in internal and external communication campaigns that portray the success stories of women leaders and position a company as one that values and attracts the best and brightest women.

The Government of Canada can be seen as a leader in this not only domestically but on the international stage, continuing to demonstrate leadership to progressively move this agenda forward and encourage industry stakeholders to act upon the insights contained within this report.

Recommendation #3: Engage in Greater Outreach & Awareness

Bridging the Gap to Clean Energy Possibility

The success of an organization is built largely on the talents of its people, and a diverse workforce is strongly linked to an ability to innovate and be an employer of choice⁵. As such, many organizations are looking to improve the recruitment and retention of women in the sector as they recognize the significant opportunities to increase business productivity and innovation⁶ through increasing diversity in the workforce including **women's participation in the sector**. Women and young girls need to receive the message that women can work and be successful in a variety of occupations. It is recommended that awareness be rooted at very young age if it is to take hold and create a fundamental shift moving forward through the development of various initiatives and campaigns at attracting young girls and women to the clean energy sector.

Recommendation # 4: Improve Recruitment, Retention & Professional Development Efforts

Establishing Influential Best Practices

A range of practices and supports to facilitate better recruitment, retention and development of women in the sector are recommended and include: mentorship e.g. **EHRC's Connected Women Mentorship Program**, sponsorship, summer employment, job shadowing, funding scholarships, bursaries, internship, unbiased hiring practices, amplification, coaching and training, networking and industry partnership. Women also need allies and advocates to help spread and support this message – allies from a broad spectrum of levels and occupations.

Recommendation #5: Improve Workplace Flexibility & Accommodation Policy

Developing Family Friendly-Policy and Workplace Culture

Since women's ability to take advantage of clean energy employment options is often constrained by social barriers that limit their participation, it is crucial that organizational cultures and policy attempt to address societal attitudes about gender roles in order for women to benefit optimally from employment in clean energy. At the employer level, it is important family-friendly human resource policies are developed and/or improved upon to ensure access to certain types of education and training and opportunities for advancement while remaining flexible and fluid to changing life circumstances. Areas of policies include: professional engagement, maternity leave, work/life balance, day to day practices (e.g. scheduling meetings) training accommodation, workplace culture (culture of parent and elder care).

1. INTRODUCTION

BACKGROUND

The Canadian energy sector is facing enormous interest and growth in clean energy. This growth, combined with a provincial, national and international focus on carbon emission reduction and energy efficiency, has resulted in a pressing need to focus on workforce planning and development strategies for the clean energy sector. The growth and integration of Smart Grid Systems and electrical vehicles for example, as well as the inclusion of conservation as a key pillar in energy policy plans, will contribute to the escalating change. Shifting economic and policy conditions will create different growth paths among the provinces and territories. The interaction and interlinkages of government policies, regulations and fiscal programs (at all levels of government) will play a role in how clean energy stakeholders respond to both business and customer needs.

As the industry transitions to new, clean sources of electricity; embraces emerging technologies; and responds quickly to national and international pressure, there is a need to engage in more progressive workforce planning. It is recognized by businesses across all sectors (including energy) that increasing the representation of women has many advantages - societal, cultural and economic.

However, despite the proportion of women in the energy industry rising and best efforts to tap into, develop and retain this cohort, the pace of improvement has been slow, with parity between men and women in the industry remaining a long way off.

OVERVIEW

The Government of Canada has signaled the importance of developing a strong evidence base for policy development and future decision making. It has also identified a number of priority areas which include clean energy and advancing gender diversity, as well as promoting a more **gender-inclusive approach to solving the world's most pressing challenges**, including climate change. While there are many studies and initiatives focusing on the participation of women in science, technology, engineering and math (STEM), there is no comprehensive labour market data specifically on women in the clean energy sector in Canada.



Thirty distinguished women and men, three energy ministers, and eight governments launched the Clean Energy Education & Empowerment (C3E) women's initiative at the first Clean Energy Ministerial in 2010 to advance **women's participation in the clean energy revolution**. Their motivation was a shared sense that the ideas and talents of all members of society are essential to accelerating progress toward a clean energy future.

C3E works to shift the status quo in the clean energy professions and enable greater gender diversity. Women hold only a small percentage of science, technology, engineering, and mathematics (STEM) jobs, and women are largely absent from C-level positions and board memberships. While the exact numbers vary among countries and within sectors of clean energy (e.g., technology, policy, and investment), it is clear that more could be done to take **advantage of women's potential contributions**.

C3E participating governments have a shared commitment to advancing women in the energy field in their home-country contexts. They undertake meaningful activities to build opportunities for greater female influence and close the gender gap, cross-linking their efforts whenever possible.

C3E is **advancing women's leadership in clean energy** and helping to harness all talent in driving the clean energy revolution forward. Launched as a network of national-level actions, C3E is **advancing women's leadership in clean energy globally through an International C3E Ambassador Corps** and the online community forum C3Enet.org.

<http://www.cleanenergyministerial.org/Our-Work/Initiatives/Women-in-Clean-Energy>

Given this knowledge gap, Natural Resources Canada (NRCan) commissioned EHRC to undertake a comprehensive review of the literature and available data on women in clean energy to address data gaps and develop analysis that could support policy development and program delivery to foster the advancement of women.

The information will also support NRCan’s work under the Clean Energy Ministerial (CEM) Clean Energy Education Empowerment (C3E) initiative that aims to advance the participation of women in the field of clean energy. In addition, the research will feed into a national dialogue on energy (Generation Energy www.generationenergy.ca), providing NRCan with data that will help inform discussions with Canadians on how women can play a bigger role in **Canada’s transition to a lower-carbon economy**.

It is critical that policy makers, employers, educators, and regulatory authorities have current and comprehensive intelligence that will allow them to address the efficiency of an ever-changing energy workforce, and enhance policy and program support to women that will contribute to the increased retention and advancement of women in the clean energy sector.

METHODOLOGY

Research Activities:

Literature review

A literature review was conducted in order to:

- Provide an overview of best available data/statistics that captures metrics on women working in clean energy. The scope of the review was based on an examination of several sub-sectors within clean energy outlined in Section 2. A Changing Energy Landscape on page 9.
- Identify key challenges or issues women face entering and/or working in the clean energy sector, as well as potential gaps in some sectors or positions

Case Studies & Key Informant Interviews

EHRC researched and prepared eleven, (11) case studies using the information from key informant interviews (conducted February 23 – March 27, 2017) with Canadian women working in the clean energy sector. Please see Appendix A for a list of consultation participants.

The case studies focused on **the interviewee’s** education background and work experience; their past and current positions, the area of work; and perspectives on opportunities and challenges they have encountered in a traditionally male-dominated sector. In conducting this research, we also identified and included the profiles of other prominent women in the sector to serve as inspiration to women in and looking to enter the sector. (Appendix A).

Advancing Women in Clean Energy Workshop

EHRC assisted NRCan in organizing a symposium (*The Future of Energy: Moving Towards a Low-carbon Economy*) held on **International Women's Day on March 8th**, 2017. The symposium brought together 129 participants from a broad spectrum of occupations within the clean energy sector for a panel discussion and information gathering workshop.

Opening remarks were delivered by:

- Kim Rudd, Parliamentary Secretary to the Minister of Natural Resources
- Yiota Kokkinos, Director General, **Office of Energy Research and Development, Natural Resources Canada**

A special announcement on the launch of EHRC's Leadership Accord on Gender Diversity for the Electricity Sector was also delivered during the opening remark by the Honourable Maryam Monsef, Minister of Status of Women. This was followed by an informative panel discussion on the future of energy hosted by Céline Bak, President, Analytica Advisors.

Panel Participants included:

- **Cara Clairman, President and CEO, Plug'nDrive** – Electric Vehicles
- Clare Demerse is a federal policy advisor, Clean Energy Canada- Tracking the Energy Revolution
- Denise Restoule, Deputy Chief, Dokis First Nation – Clean energy in Indigenous Communities
- Aisha Bukhari, Engineer/Entrepreneur – The Role of Smart Grid and Energy Storage

EHRC then facilitated an interactive workshop entitled *Advancing the Role of Women in Clean Energy* that was attended by about 60 participants. Key messages/findings from the workshop have been captured throughout this report to supplement literature and key informant interview findings.

SCOPE LIMITATIONS

In researching this report, secondary sources were reviewed. The majority of key global data originates from the 2016 Annual Review of the International Renewable Energy Agency (IRENA)² with comparative data in the U.S. from the U.S. Energy and Employment Report (USEER). Data has also been included from relevant Statistics Canada publications and organization specific reports*, where available, **as well as EHRC's own labour market information data** to build a **profile of women's representation in the sector**.

² IRENA maintains the most up to date publically available information on global employment in the clean energy sector

A number of key national organizations were also contacted directly in an attempt to identify any data specific to the Canadian labour context regarding the representation of women in clean energy, including:

- Agricultural Human Resources Canada
- Canadian Solar Industries Association (CanSIA)
- Canadian Wind Energy Association (CanWea)
- Canadian Geothermal Energy Association (CanGEA)
- Canadian Energy Efficiency Alliance (CEEA)
- Clean Energy Canada
- Electricity Human Resources Canada
- Marine Clean energy Canada
- Smart Grid Canada
- Biotalent
- Women in Renewable Energy (WiRE)
- Women in Nuclear (WiN)

In the majority of cases (with the exception of our own limited in-house data and data discovered at Solar Canada) gender disaggregated data in clean energy does not exist.

Report Structure

This report attempts to synthesize existing knowledge on the degree of women's participation in the clean energy sector while highlighting key challenges and forward-looking opportunities to entering and working in this sector. Knowledge has been gathered through a variety of methodologies including a literature review, key informant interviews, case study development and key messages from participants in the collaborative Natural Resources Canada (NRCan), Electricity Human Resources Canada (EHRC) and Women in Renewable Energy (WiRE) workshop: *Advancing Women in the Clean Energy Sector workshop* held on March 8th, 2017. The workshop was part of NRCan event: *The Future of Energy: Moving Towards a Low-carbon Economy*.

Where possible and appropriate, findings on the **state of women's participation** are contrasted alongside data from the US and other countries. In reviewing this report, it is important to caution that sex-disaggregated data on employment in clean energy is extremely spotty everywhere in the world.

The report also provides practical recommendations for action which could support a variety of key stakeholders including government, current and future employees, employers, training providers, and enhance their efforts to ensure full representation of women in the sector now and in the future.

2. A CHANGING ENERGY LANDSCAPE

The Intergovernmental Panel on Climate Change⁷, **the world’s foremost authority on climate change, has projected** that an increase in global temperatures of more than 2 degrees Celsius will result in irreversible and catastrophic impacts. If the current trajectory remains the same, the level of greenhouse gas (GHG) emissions is expected to raise global temperatures by 3.5 °C before the end of this century. The effects on the climate in Canada are further noted to be extensive with temperatures expected to rise two times faster than the global average. In northern Canada, this rise is expected to be three times faster.⁸

Concerns about environmental sustainability have convinced many countries, including Canada, to transition to solar, hydro, bioenergy, wind and other clean sources of energy. In December 2016, the Pan-Canadian Framework on Clean Growth and Climate Change was released⁹. Developed with the provinces and territories and in consultation with Indigenous peoples, the framework is a collective plan to grow the Canadian economy while reducing emissions by 2030 and building resilience to adapt to a changing climate. It will help Canada transition to a strong, diverse and competitive economy; foster job creation, with new technologies and exports; and provide a healthy environment for future generations.

The Pan-Canadian Framework is both a commitment to the world that Canada will do its part on climate change, and a plan to meet the needs of Canadians. Momentum has been built from the Paris Agreement by developing a concrete plan which, when implemented, will allow Canada to achieve its international commitments. As Canada transitions to a low-carbon future, energy will play an integral role in meeting its collective commitments, given that energy production and use account for over 80 percent of Canada’s GHG emissions. This means using clean energy to power homes, workplaces, vehicles, and industries, and using energy more efficiently.

According to a Clean Energy Canada Report¹⁰, Canada already has one of the cleanest electricity sectors in the world. Today, 80 per cent of our power comes from non-emitting sources, such as hydro and nuclear, as well as hydro wind and sun—and that share of clean electricity is poised to grow and . Clean electricity is a comparative advantage for Canada, one that positions us to lead in the global clean energy economy - helping to keep the lights on, reduce energy waste and build a more sustainable low carbon future. With this growth brings the opportunity for new jobs for Canadians across the country.

WHAT IS CLEAN ENERGY?¹¹

Clean energy policies, technologies or services accelerate the shift to an economy based on renewable energy. The clean energy transition involves:

Increasing the supply of clean energy.

Reducing consumer and industrial energy demand.

Improving the infrastructure and systems that transmit, store and use energy.

Enabling market penetration of clean energy solutions.

There has been some discussion as to what constitutes clean energy, or the subsectors that make up the sector. There are definitions of clean energy currently used that can differ depending on the purposes of studies undertaken. For the purpose of this study, and drawing upon definitions from the Clean Energy Tracker of the International Energy Agency (IEA), **Canada's definition of clean energy in the context of Mission Innovation** and the key areas of work of the Clean Energy Ministerial, clean energy is poised to include the following:

ENERGY SUPPLY

- Hydro-energy
 - Large Hydro projects >50 MW; Small Hydro projects <50 MW; Mini Hydro projects <100 KW to 1 MW
- Solar (PV and Thermal)
- Wind (onshore and offshore)
- Marine and Tidal Energy or Wave and Ocean Power: Marine renewable energy resources include the kinetic **energy carried by waves, currents and tides as well as the energy stored in the ocean's thermal and salinity differences.**
- Geothermal or Earth Energy: both **geothermal electric power plants and GeoExchange™ systems**
- Nuclear
- CO2 capture, utilization and storage
- Cleaner fossil energy
- Hydrogen and fuel cells
- Waste and Recycling or Waste-to Energy i.e. Energy generated from the sustainable management of municipal solid waste - landfill gas and waste-to-energy projects)
- Biofuels
- Bioproducts usually divided into 3 categories – biomaterial, bioenergy and biochemical
- Agriculture: includes the implementation of practices such as:
 - Using wind or solar power to **power their farm operations (livestock buildings etc.), or as a “crop”** in and of itself (selling power to the grid)
 - Biomass: growing crops for energy (e.g. corn for ethanol), or burning biomass for energy to support farm operations.

ENERGY DEMAND

- Energy Efficiency includes green building activities and other energy efficiency technologies and applications.
- Energy Storage systems that improve the ability of renewable energy resources to provide power when required
- Smart Grid and Demand Management - infrastructure that enables the delivery of power from generation sources to end-uses to be monitored and managed in real time.
- Alternative and Sustainable Transportation - includes two different subsectors: (1) vehicles and (2) transportation systems planning. The vehicles subsector includes electric vehicles, hybrid vehicles, alternative fuel vehicles, and fuel cell vehicles. It also encompasses repair and maintenance of these vehicles and fueling stations for these vehicles (e.g. stations supplying natural gas, hydrogen, electric power, etc.). The

transportation systems planning subsector includes mass transit systems, transportation systems planning, and transportation logistics with reduced environmental impact such as traffic monitoring software or truck fleet tracking systems.

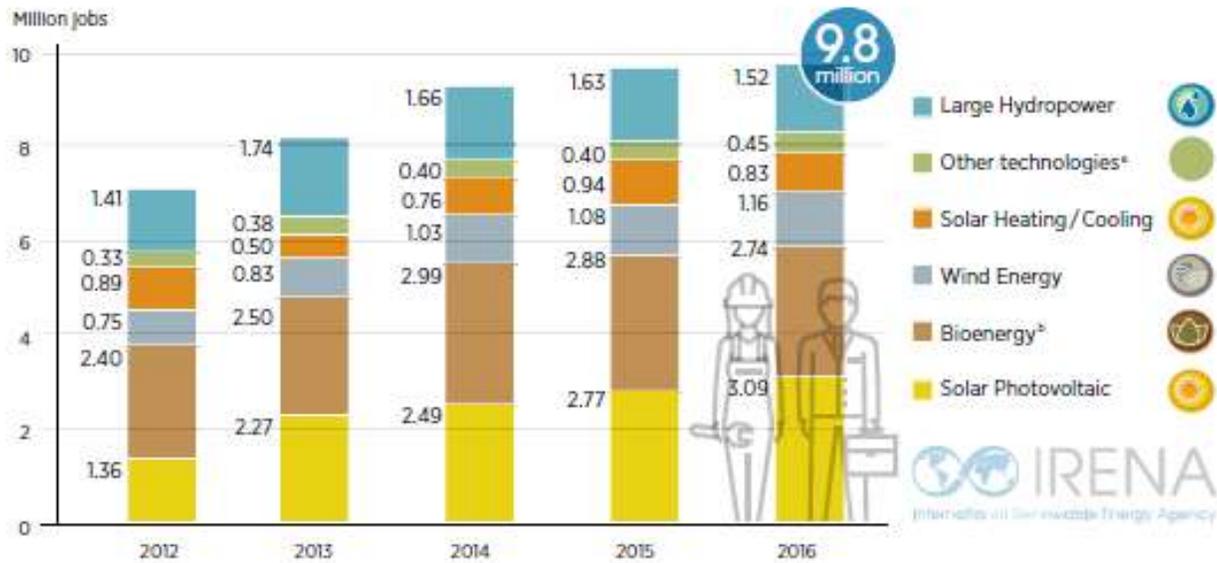
3. REPRESENTATION BY THE NUMBERS

GROWING GLOBAL CLEAN ENERGY EMPLOYMENT:

As the role of clean energy in the global energy system has expanded so too has its workforce grown as noted by the following key facts presented in the **International Renewable Energy Agency (IRENA)**'s 2017 Annual Review¹²:

- Global renewable energy sector employed 9.8 million people in 2016 – a 1.1% increase over 2015. Jobs in renewables, excluding large hydropower, increased by 2.8% to reach 8.3 million in 2016.
- China, Brazil, the United States, India, Japan and Germany accounted for most of the renewable energy jobs. The shift to Asia continued, with 62% of the global total located in the continent.
- Solar photovoltaic (PV) was the largest employer, with 3.1 million jobs, up 12% from 2015. The growth came mainly from China, the United States and India, whereas jobs decreased for the first time in Japan, and continued to decline in the European Union.
- New wind installations in the United States, Germany, India and Brazil contributed to a 7% increase in global wind employment, which reached 1.2 million jobs.
- Liquid biofuels (1.7 million jobs), solid biomass (0.7 million) and biogas (0.3 million) were also major employers, with jobs concentrated in feedstock supply. Brazil, China, the United States and India were key bioenergy job markets.
- Jobs in solar heating and cooling declined 12% to 0.8 million amid an installation slowdown in major markets such as China, Brazil and the European Union.
- Large hydropower employed 1.5 million people (direct jobs), with around 60% of those in operation and maintenance. Key job markets were China, India, Brazil, the Russian Federation and Vietnam.

FIGURE 1: GLOBAL RENEWABLE ENERGY EMPLOYMENT, 2012-2016



Note: a) Includes geothermal energy, hydropower (small), concentrated solar power (CSP), municipal and industrial waste, ocean energy and miscellaneous.
 b) Includes liquid biofuels, solid biomass and biogas.

FIGURE 2: RENEWABLE ENERGY EMPLOYMENT BY TECHNOLOGY

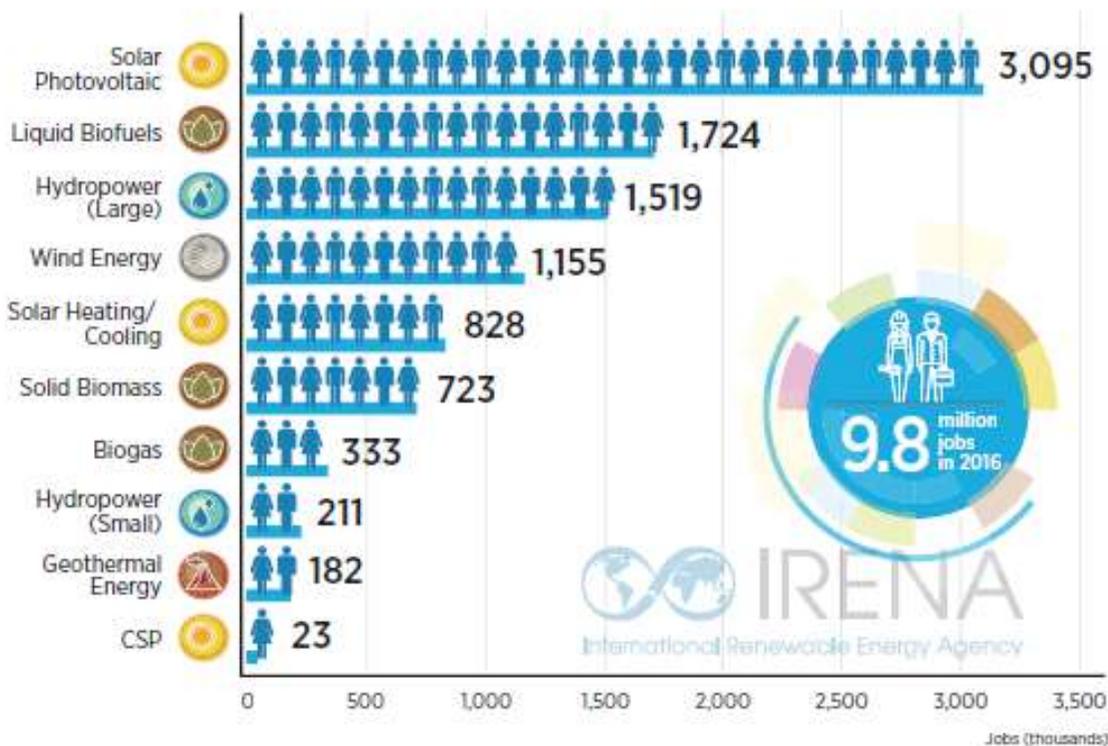
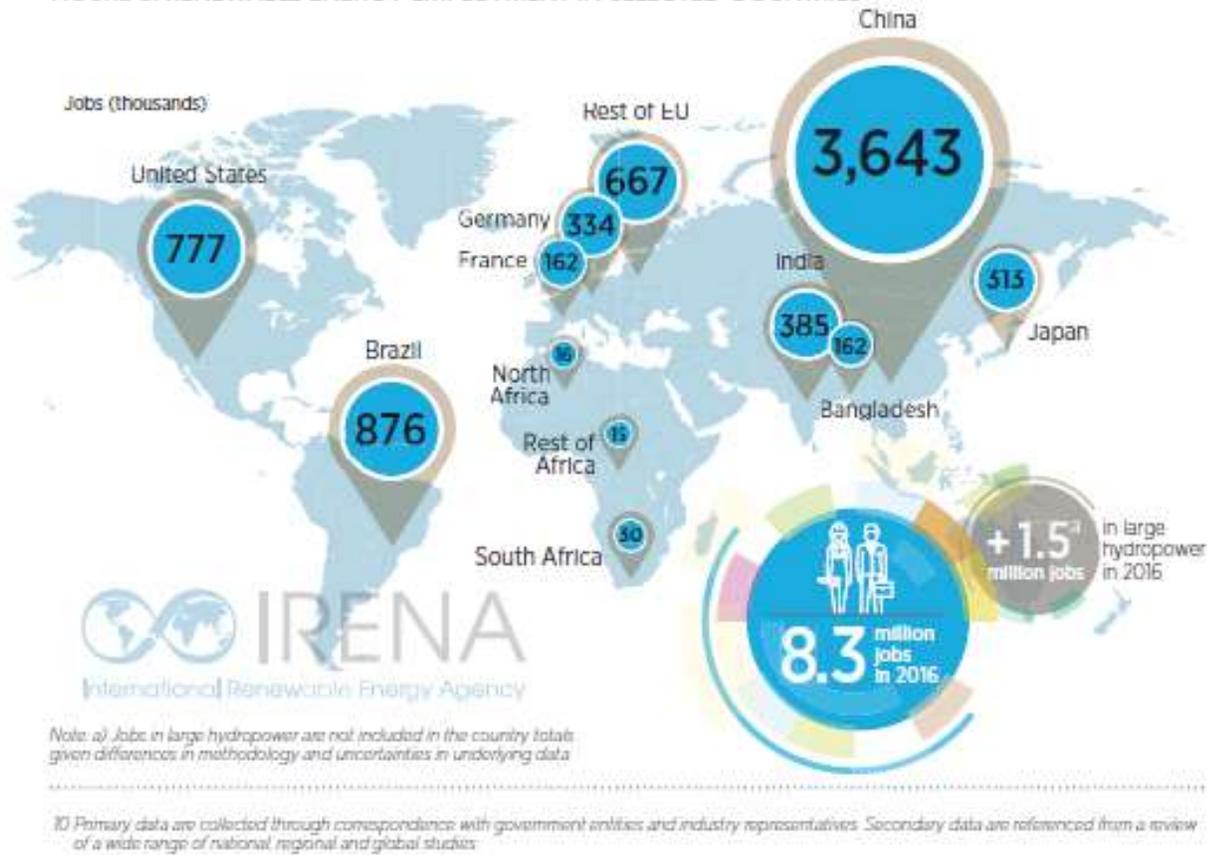


FIGURE 5: RENEWABLE ENERGY EMPLOYMENT IN SELECTED COUNTRIES



CANADA'S RANKING OF CLEAN ENERGY EMPLOYMENT

According to a Clean Energy Canada report¹³, Canada is ahead of the curve, with a grid already drawing on significant amounts of renewable power thanks to a legacy of hydropower and recent growth from other sources, most notably wind and solar.

In Canada, data on the overall number of those employed in the clean energy sector are sparse. Most recent data comes from findings released as part of EHRC's 2013 [Renewing Futures report](#), a major human resources research project undertaken to assess the capacity of Canada's skilled workforce to meet the labour requirements of projected additions to electricity related renewable energy systems. The scope of research –and subsequent recommendations included seven renewable or clean energy areas: Wind, Solar, Bioenergy, Geothermal, Hydro (Small and Large), Marine; Tidal and Wave, and Integration and Storage.

Over 400 stakeholders participated, speaking to government policy, human resources management, training, technology and energy market assessments that project additions to renewable electricity capacity from 2011 to 2022. The job potential was found to be **significant, with the most optimistic “Vision” scenario** seeing 620,000 person years of manufacturing construction and installation employment needed to build new capacity and 34,000 jobs by 2022 in operations. The jobs that are created are highly skilled, well paid and within technical occupations that offer opportunities for advancement across a career.

Hydro Power¹⁴: Canada’s hydropower industry generates 63% (2013) of Canada’s electricity, providing

Canadian households and businesses with a clean, reliable and renewable source of electric power. In addition to the significant environmental benefits associated with hydroelectric power, the industry also generates substantial ongoing contributions to economic activity in the form of Gross Domestic Product and employment. In fact, over the next twenty years, the Canadian HydroPower Association estimates that hydropower project development could benefit Canada with over \$125 billion in investments and a million jobs. that Throughout its 130 year history in Canada, hydropower has helped develop remote regions, attracted industries, stimulated economic growth, nurtured innovation, and created world-class expertise. Hydropower has been and continues to be a driving force for **Canada’s economy**.

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Wind: Wind systems are the second largest segment of the clean energy sector, after hydro, in Canada. CanWEA **believes wind energy can satisfy 20 percent of Canada’s electricity demand by 2025** according to its WindVision 2025: Powering Canada's Future. Achieving this vision will pay huge dividends including:

- **Generating \$79 billion of investment that will make Canada’s wind energy sector a real player in a \$1.8 trillion global wind industry**
- Creating at least 52,000 high quality, full-time jobs including many in rural communities
- Producing \$165 million in new annual revenues for municipalities
- Adding 55,000 MW of clean generating capacity that will strengthen our electrical grids and head off potential power shortages
- Stabilizing electricity prices
- **Cutting Canada’s annual greenhouse gas emissions by 17 Megatonnes**

“Women must be part of the clean-energy revolution – playing central roles in bringing cleaner, renewable energy onto the grid, accelerating innovation in clean energy technologies, encouraging energy efficiency and increasing our resilience to climate change.

We can’t afford to have half of the world’s talent on the outside looking in. And that’s true for all parts of our economy, and all parts of our country.

The Prime Minister believes so strongly in having more women in leadership positions that he appointed the first gender-balanced cabinet in Canadian history.”

Secretary Rudd keynote speech during an NRCan event on the Clean Energy Education **Empowerment Women’s Initiative - The Future of Energy: Moving Towards a Low-carbon Economy** held on March 8th, 2017.

Without question, Canada should and will continue to deploy clean energy to meet the federal targets of phasing out coal-fired power and achieving 90% non-emitting power by 2030.

Solar: Similar to global growth, the solar electricity sector is growing rapidly in Canada. Much of this success is based on the growth of the Ontario solar market where more than 99% of Canada's solar electricity is generated. Ontario has also developed a globally recognized solar market sector. While it has experienced challenges, it is today one of the top 20 solar electricity markets in the world, based on solar installations.

“Gender diversity can drive innovation, open new pathways for technology deployment, bring fresh perspectives in leading communities toward cleaner sources of power, attract and retain a diverse pool of talent, and boost the bottom line; studies show that organizations’ outcomes qualitatively improve when the leadership is composed of at least 30% of each gender.”

Clean Energy Education and Empowerment (C3E).
<http://www.cleanenergyministerial.org/Portals/2/pdfs/factsheets/C3E-CEM7-FS.pdf>.

Solar Vision 2025: Beyond Market

Competitiveness., developed in partnership with Ernst & Young, is CanSIA's roadmap document for the future of the Canadian Solar Energy Industry. It shows the solar industry is set to grow and reach market competitiveness because it is delivering on its commitment to reduce costs and because solar power is peak power that offsets some of the grid's most expensive energy during high demand periods. Incentives invested today will pave the path to endowing a clean energy tomorrow.

“By 2025, solar energy expects to be widely deployed throughout Canada, having already achieved market competitiveness and no longer needing government incentives,” said David Eisenbud, former Chair of the CanSIA Board of Directors. **“By 2025 solar will be supporting more than 35,000 jobs and displacing 15 to 31 million tonnes of greenhouse gas emissions per year, while providing a safer, cleaner environment for generations to come.”**

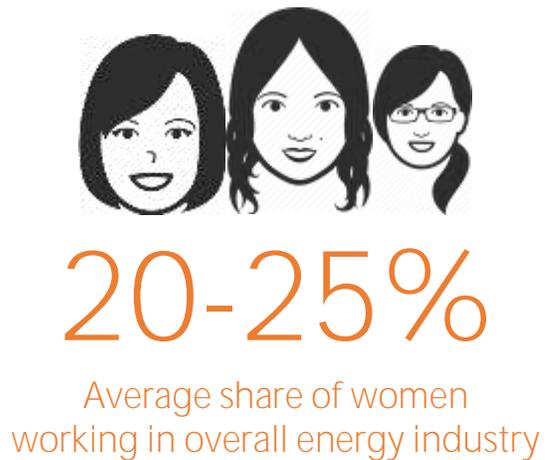
With these shifts and growth, a lot of attention is being paid to the technologies and financing for clean energy. However, very little attention is being paid to the employment equity and opportunities in transitioning to clean energy – in particular, for women¹⁵. The challenges of growth, job creation, and inclusion are closely intertwined. These findings reinforce the need for proactive outreach to expand the number of women entering the clean tech sector, encouraging them to consider employment in the sector as a long term career path that offers opportunities for advancement in socially meaningful work.

As the sector continues to grow and evolve, our competitiveness relies on our ability to be able to attract and retain a diverse pool of talent capable of bringing fresh perspectives – which includes women. The C3E initiative asserts that **the solutions to the world's great challenges, including the transition to a clean energy economy, will succeed only if we harness all possible talent.** The clean energy sector therefore stands to benefit from, and should contribute to, **improvements in women's status within this industry.** This cohort, however, remains under-represented in the clean energy field as the worldwide literature and data presented in the next section show.

REPRESENTATION OF WOMEN AND CLEAN ENERGY GLOBALLY

Applying a gender lens to clean energy reveals a major blind spot since women are marginalized globally in employment in the sector. Add to this the fact that gender-disaggregated data in clean energy is extremely limited, making analyzing trends and comparisons challenging.

Limited gender-disaggregated data for the clean energy sector suggests that women worldwide hold approximately 20-25 percent of the workforce in the overall energy industry in advanced industrialized nations, less than six percent of these are technical positions and below one percent are top management positions in the sector. **This percentage remains lower than women's economy-wide share in employment, which is 40 - 50% for most OECD countries.**¹⁶



Key Sources of Clean Energy Employment for Women

Although gender-disaggregated data on renewable energy employment in industrialized countries is scarce, data from Canada, US, Spain, Germany and Italy indicate a general trend of women being employed mostly in non-technical occupations in clean energy -- in sales, followed by administrative positions and finally engineers and technicians¹⁷. In absolute numbers, the largest sources of renewable energy employment for women in industrialized countries are solar photovoltaic, solar heating and cooling, wind power, biomass and biofuels.¹⁸

Attempts to Close the Data Gap¹⁹

As a first step to close the data gap, IRENA conducted an online survey among private companies working in the clean energy sector. Nearly 90 companies from more than 40 countries participated, representing the entire value chain of the sector (including, manufacturing, installation, operations and maintenance, consulting and policy making). Among the companies that responded, women represent an average 35% of the workforce. This is a significant finding, considering (as noted above) women only account for 20 - 25% of the workforce in the overall energy industry. This may reflect greater interest among women in sustainability-related fields as of late.

The survey results are generally in line with numbers submitted in the annual reports of large companies. At Trina Solar and REC Group, for example, women represent 42% and 35% of the workforce, respectively (REC Solar ASA, 2015, Trina Solar, 2014)

The survey also provides insight on the roles women fulfill in the sector. On average, women represent 46% of the administrative workforce, 28% of the technical workforce, and 32% of management roles. The latter is a marked increase from the estimated 25% of senior-level management positions held by women in Fortune 500 companies in 2015. Indeed, as a new and fast-growing sector, clean energy could give women opportunities to gain commensurate representation in higher management. While the survey provides some company-level insights, it does not yet reveal the evolution of gender roles within the sector.

WOMEN'S PARTICIPATION IN CLEAN ENERGY IN CANADA

The following section provides what limited data is available on the participation of women in the clean energy sector in Canada. As previously noted, a number of key national organizations were contacted directly in an attempt to identify data specific to the Canadian labour context speaking to the representation of women in clean energy. In most cases gender disaggregated data does not exist. The data below refers to that which exists.

CANADIAN ELECTRICITY SECTOR

The Canadian electricity industry's most urgent human resources priority is closing the supply-demand gap resulting from the current and projected exodus of older, experienced workers creating the need for highly of skilled, new entrants. It should be noted that the need for new workers is not specific to hydro. Other subsectors, such as nuclear, wind, solar, etc. will require a larger workforce and, therefore, without additional workers entering the industry, sub sectors may begin poaching employees from each other.

The 2011 Labour Market Information (LMI) Report, [Power In Motion](#), recommended that all stakeholders in the electricity and clean energy industry join in united action to develop recruitment strategies that specifically target the groups that are under-represented in the industry.

Within the electricity sector, women represent only a quarter (25%) of the electricity workforce, compared to the national average of 48%. In the trades, that number is much lower, less than 5% - numbers which are very similar to that which has been presented globally. Employer Survey results as part of the 2011 LMI revealed the following percentages of women workers, per occupational group:

OCCUPATIONAL GROUP	PERCENTAGE OF WOMEN
Managers/Supervisors	~14%
Engineers	~18%
Technicians/Technologists	~11%
Trades	~4%
Information Technology (IT) Occupations	~34%

While the proportion of women in the industry is rising, it remains well below the average for the Canadian workforce and reflects the general importance of engineers, engineering technicians and technologists as well as skilled trades. Women are traditionally underrepresented in these occupations. Human resource strategies that target recruiting in general could well start with adding to the proportion of women in these key occupations.

All provincial electrical utilities in Canada are experiencing similar scenarios in regards to the low representation of women in the industry. In some provinces we know that there are very limited numbers of women in some trades, an example being that of the powerline technician trade (PLT), which sees numbers in the single digits in many provinces. This is a huge retention issue for the sector, as these women find it especially difficult to stay engaged and have reported feeling extremely isolated.

This low representation of women in the electricity sector illustrates the immediate need to attract, engage and recruit this largely untapped target group. In addition, the labour shortage is being experienced by various sectors within the Canadian economy, leading to increased competition for supply. Engaging this under-represented group is, and remains, a priority for EHRC.

An electricity and clean energy industry initiative targeting women could link to ongoing efforts by engineers and many groups in the skilled trades. There is room for a unique industry program that targets the skilled trades dedicated to electricity generating and distribution (e.g. electrical power line and cable workers) – including the emerging occupations for clean energy programs. There is also room for a targeted effort to bring women into engineering technician and technologists programs.

EHRC is leading the way in this area by developing and implementing various projects, programs and initiatives including:

- **Bridging The Gap – Women in the Workforce**
With the support of industry and provincial governments, EHRC launched its Bridging the Gap project to examine the issues and barriers around the recruitment and retention of women into the electricity industry. Along with the research portion, this project also sought to develop practical solutions for employers and other stakeholders to overcome these challenges.

The tools and resources developed as part of the Bridging the Gap project can be used to support the industry in positively impacting the representation of women in the sector. At the same time, the results of this project can also act as a resource for women seeking more information on electricity and renewable energy careers. Further details on existing programs and case studies to enhance the recruitment, and retention of women can be found here: <http://electricityhr.ca/workplace-support/recruitment-retention/bridging-the-gap/programs-studies/>

- **Connected Women Mentorship Program**
Feedback from EHRC industry stakeholders has emphasized the significant role that mentors can play in the successful attraction and retention of female workers in the sector. As a result, EHRC initiated its Connected Women project (funded through the Status of women) to develop and implement a national mentorship Program. EHRC is proud to announce the official launch of this program.
- **Leadership Accord – Gender Diversity in the Canadian Electricity Industry**
The National Leadership Accord is an initiative borne out of our [Connected Women](#) Project. The Leadership Accord on Gender Diversity in the Canadian Electricity Industry (the Accord) is a public commitment by employers, educators, unions and governments to promote the values of diversity and inclusion within their organizations.

The signatories to this Accord acknowledge that united action is required to ensure the support of women in the industry, along with equality and fairness for the entire workforce. This is a real opportunity for employers, and all those who support the sector, to actively engage in building an electricity workforce that is truly **representative of Canada’s people**.

SOLAR

Globally, solar electricity is now the fastest growing energy source in the world. In fact, the International Energy Agency (IEA) forecasts that by 2050, **solar electricity could account for 27% of the world's electricity mix, making it the world's largest source of electricity, ahead of nuclear, fossil fuels, hydro and wind.**²⁰

In Canada, the solar electricity sector is growing rapidly. Much of this success is based on the growth of the Ontario solar market where **more than 99% of Canada's solar electricity is generated. Ontario has developed a globally recognized solar market sector.** While it has experienced challenges, it is today one of the top 20 solar electricity markets in the world, based on solar installations.

EHRC was able to identify some data on the participation of women in this sub-sector via Canadian Solar. According to Canadian Solar, ²¹ *"women now represent a rapidly growing workforce in what has traditionally been a male dominated industry, solar energy. And nowhere is this trend more apparent than at Canadian Solar where women now represent around 35% of the workforce, globally. In addition, women occupy 25% of all positions at manager level and above.*

The above statistics represent leaders in the field of tech-industry female employment and it is clear that Canadian Solar ranks among them. It is difficult to come by accurate global figures in the tech and tech manufacturing sectors because companies with low diversity scores tend not to advertise the fact and prefer to talk more about what they are going to do for women rather than what they have already done. But typically women in the sector seem to appear in the 20% to 25% range with management figures at 15 to 20 percent."

JURISDICTIONAL COMPARISON

Where are Women Working in the U.S. Energy Sector?

Country-specific literature points to a positive trend of greater participation of women. The U.S. Department of Energy recently released its second annual analysis of the U.S. energy workforce. The 2017 U.S. Energy and Employment Report (USEER)²² finds that the Traditional Energy and Energy Efficiency sectors today employ approximately 6.4 million Americans. These sectors increased in 2016 by just under 5 percent, adding over 300,000 net new jobs, roughly 14 percent of all those created in the country. The 2017 USEER analyzes four sectors of the U.S. economy. The first two of those sectors make up the Traditional Energy sector:

- Electric Power Generation and Fuels
- Transmission, Distribution and Storage
- Energy Efficiency
- Motor Vehicles

Overall, the Traditional Energy and energy efficiency sectors increased by nearly 5 percent in 2016, adding over 300,000 new jobs and bringing the total to 6.4 million jobs.

The report also examined women’s representation in energy. Currently, the U.S. energy sector is less diverse than the overall national workforce. While women make up 47 percent of the national workforce, women comprise a noticeably smaller portion of the workforce in the energy sector, ranging from 21 to 38 percent. However, while this is below the national average, this is a major improvement over 2015—when women’s participation ranged from just 18 to 26 percent.

The chart (right) shows how women’s participation in the energy workforce varied across the U.S. energy sectors in 2016.

The 2016 report also found that 73 percent of all employers surveyed found it difficult to hire new employees who possess the required skills. This hiring difficulty speaks to the need for more skilled workers in the sector—a need that could be filled by the increased participation and leadership of women.

This issue has also been highlighted in the Canadian energy industry, and is exacerbated by the level of qualifications required to work in many occupations. It also points to the need for both employers and government to work closely with educators to ensure that the curricula in post-secondary institutions reflects the current and future needs of employers. A review amongst partners of curricula particularly as it relates to green energy jobs (e.g. energy efficiency, smart grid,)will be required to determine where best curricula needs to be adapted and/or developed to better reflect the requisite new skills and competencies required to meet the innovation and changes being seen in the clean tech sector today.

Workforce	Women Participation
Nuclear Electric Generation	38.1%
Natural Gas Electric Generation	38%
Coal Electric Generation	37.3%
Bioenergy/Biomass Electric Generation	34%
Electric Power Generation	34%
Traditional Hydroelectric Generation	33.9%
Solar Photovoltaic	32.6%
Concentrating Solar Power	32.6%
Combined Heat and Power	32.4%
Wind	32%
Oil Electric Generation	31.9%
Low-Impact Hydroelectric Generation	31.2%
Nuclear Fuels	28.8%
Petroleum Fuels	25.5%
Transmission, Distribution, and Storage	25%
Natural Gas Fuels	24.1%
Energy Efficiency	24%
Fuels	24%
Motor Vehicles	22%
Coal Fuels	21.3%

4. KEY CHALLENGES

A review of the available literature, data and consultations with women working in a variety of occupations across the clean energy sector in Canada provides some indication of factors that may either challenge or facilitate women’s meaningful participation (as presented below). It is believed that with appropriate awareness, policy interventions, and shifts in societal attitudes there is an opportunity for increasing the participation of women within the clean energy sector in Canada – and around the globe.

Challenge #1: Limited Awareness

Breadth of Opportunity & Visible Role Models

In speaking to the challenges in attracting women to the sector, consultation participants noted a prevalent lack of understanding and clarity about what the clean energy sector looks like (e.g. range of jobs, occupations and opportunities) which makes it difficult to navigate a clear career path.

Once in the sector, career advancement was noted as particularly challenging given the very limited number of visible role models in the sector thus ‘denying’ women the opportunities and empowerment needed to realize their full potential.

In particular, women are noted to be grossly under-represented in middle and senior management (C-Suite) and supervisory positions. According to consultation participants, many of the known female leaders seem to be persistently represented in typically feminized occupations such as Human Resources and Communications with **“not a lot of women at the table.”**

In citing these perspectives it is important to contrast with Statistics Canada data²³ *Women in Canada: A Gender-based Statistical Report* (2010-2011). In consideration of all occupations, this data notes:

- 2% of jobs filled by women were in natural sciences, engineering and mathematics, compared to 10.6% by men. The low percentage of women in this occupation class has remained the same for over 25 years.
- 3.3% of jobs filled by women were in the trades, transport and construction compared to 26.3% by men.
- 34.7% of jobs filled by women were professional occupations (e.g., business and finance, social sciences, teaching, doctors, dentists, nursing), compared to 24.4% by men.
- 54.1% of jobs filled by women were in clerical and administrative occupations and sales and service. In contrast, men filled 27% of jobs in these two occupational groupings.



“I want those numbers to increase and want more women in the sector but also see it as more of a challenge to overcome – as a sector we really have the opportunity to pave the way for others. While it’s disheartening to see that there are not a lot of women – I also think of it as a real privilege to help pave the way.”

Advancing Women in the Clean Energy Sector in Canada
– Workshop Participant and Interviewee.

Challenge #2: Culture and Preserving the Status Quo

The Old Boys Network

Even when women have significant training, hold positions of power and good employer policies are developed, a culture to preserve **the status quo and the “old boy’s network”** is still a perceived issue preventing women from full participation.

Misperceptions about Role and Ability

A combination of women’s self-perception as well as societal perceptions of women’s roles or abilities (perpetuated by men and women alike), prevent them from **“feeling bold”** to pursue non-traditional roles in the renewable energy sector.

“When women are in a predominately male field you are a novelty - seen as a woman not as the person or smarts. We don’t recognize talent, we recognize gender.”

Advancing Women in the Clean Energy Sector in Canada –
Workshop Participant and Interviewee.

These perceptions go so far as the conscious or unconscious bias within families and amongst generations when discussing career potential with boys and girls. As noted by consultation participants, there is an early perception of male / female career streams (e.g. males go into engineering and females go into accounting). It was suggested that parents (and in turn educators) need to discuss career potential with boys and girls equally.

Other situations, according to consultation participants, find women in meetings who are quickly passed over by male colleagues or senior management with little to no acknowledgement of their perspectives or position. According to a workshop participant, *“People who are in meetings need to know how to stop ‘mansplaining’³ and ensure women are recognized for their ideas. Often an idea will be ignored by a group if is brought up by a woman but recognized when the same idea is brought to the group by a man.”* Additionally, unspoken assumptions were noted to prevail in situations where the individual is the only woman in the room e.g. during a meeting she is oftentimes handed the administrative tasks- *“It is assumed that it comes with ‘women’s work.”*

Other challenges noted relate to not being taken seriously, **difficulties in responding to women’s authority and the social constructs** that make it difficult for others to accept women achieving certain goals.

Workplace Safety (Harassment & Discrimination)

Discriminatory attitudes can present obstacles for women’s entry into and navigation through the clean energy sector. Consultation participants identified the subtle, underhanded and in a few cases overt **“harassment”** experienced as a challenge in their workplaces. Unfortunately they say, an **“old boys club”** mentality still permeates many workplaces in the sector.

³ explaining something to someone, typically a man to woman, in a manner regarded as condescending or patronizing

Challenge #3: Balance, Flexibility & Accommodation

Family-Friendly Human Resource Policies

Family obligations and the lack of family-friendly culture and policies (e.g. maternity leave) emerged as key issues for women trying to advance in clean energy workplace environments. In particular, many women still carry the responsibility for running the home and caring for elder family members thus finding themselves disadvantaged, even discriminated against, by this role as they attempt to navigate a career in the sector. A lack of flexibility in meeting times and limited supports (e.g. onsite childcare) as it relates to travel to training and conferences were also noted to limit women from taking full advantage of the opportunities available to them. Faced with employment practices that are not family friendly, consultation participants called for better support under workplace policy.

“Conflicting expectations of family leader and corporate leader – the most important thing a woman can do is chose a supportive life partner”

Advancing Women in the Clean Energy Sector in Canada – Workshop Participant and Interviewee.

5. GOING AGAINST “TRADITION” WITH THE OPPORTUNITY TO LEAD

So, what is the secret to ensuring workforce diversity and recruiting women and girls to the electricity sector? Women and girls need to receive the message that women can work and be successful in a variety of occupations – policy, management, engineering, technology, as technicians and in trades as the following sections demonstrate. The following section attempts to provide inspiration for women looking to enter or advance in the clean energy sector. This section along with the Profiles of Women Working in the Canadian Clean Energy Sector on page 32 offer a number of lessons and actions women at all levels of their career can begin practicing today.



“Women are just as purposeful, driven, and strategic as men are, yet bring with them a powerfully different perspective for performance, people development, and business improvement..”

Women of Influence: **Solutions To Women’s Advancement**
<http://www.womenofinfluence.ca/consulting/advancementwhitepaper/#.WSg0Wuv1CM8>

Women as Change Agents in Energy and Climate Change decisions & Policy Making

According to a 2014 White Paper of the USAID/IUCN Initiative Gender Equality for Climate Change Opportunities (GECCO)²⁴, women must be part of the economic, social, and political transformations that come with a transition to a clean energy future, participating as agents of change rather than merely recipients. Research consistently shows that economic growth for women has an important multiplier effect - when women flourish, so do societies.²⁵ We must see gender equality as an important driver of transformational change and improved outcomes.

“Women can be very successful in [the solar] industry, and their voices are needed here. But there is a lack of role models. Women don’t see other women in the solar industry in their social media feeds or coming to speak to their classrooms—they’re not getting exposed to the possibilities of the solar industry.

The gender gap in solar is similar to the general construction industry. Recruiting is partially the issue—women just don’t know about the solar industry and how rewarding it can be.

Renewable energy and solar as an industry is attractive to women because it’s really rewarding. I think it appeals to the compassionate side of women who care about the environment, the community and public health.”

Anna Bautista, vice president of construction and workforce development at GRID Alternatives
<https://www.1776.vc/insights/women-thriving-in-solar-industry-in-spite-of-major-gender-gap/>



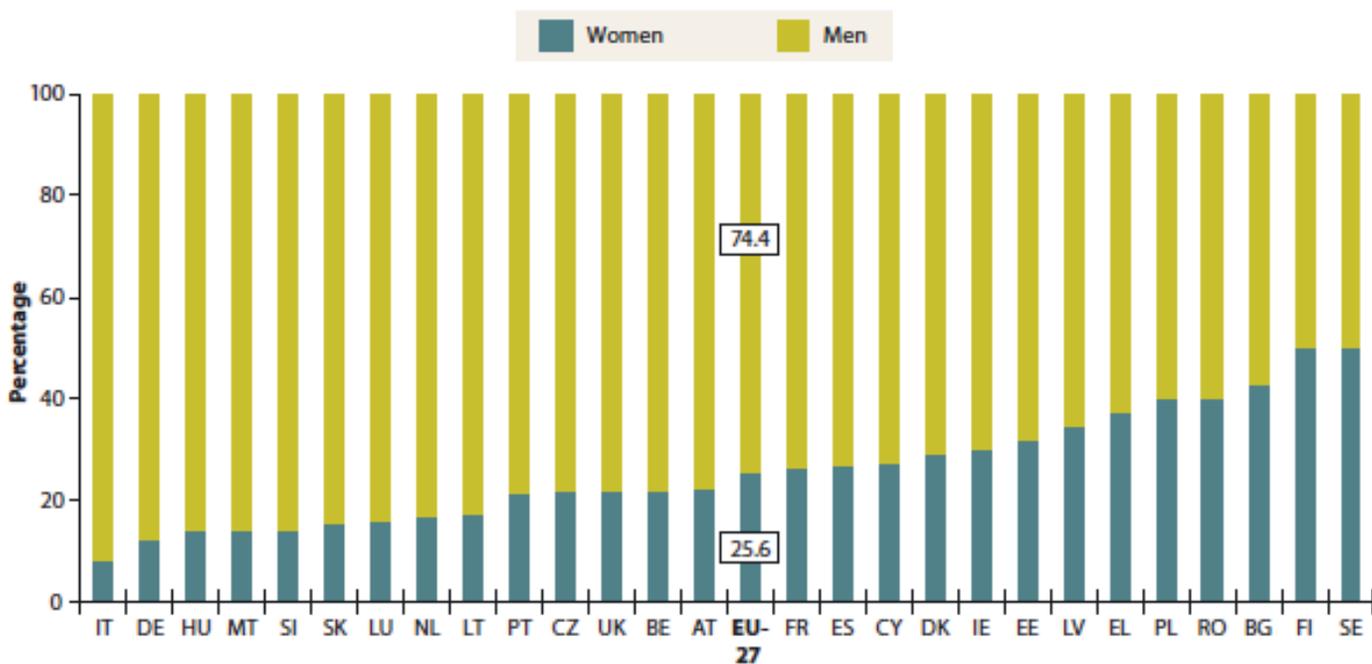
The sentiment of this opportunity for change was echoed by comments made of consultation participants who spoke to the fact that the clean energy sector resonates with women’s social and environmental motivations and values to make a difference – *“By being more inclusive of women this will only make the sector stronger.”*

GLOBAL REPRESENTATION IN DECISION MAKING

Data on women’s share of decision making positions in developing countries is rare, but the information available shows that women’s participation in climate change decision-making at local, national or international level is not equal with men’s. Thus, additional strides are needed towards creating gender balance.

According to the Global Human Development Report for 2016²⁶ the proportion of seats held by women in parliaments worldwide sits at 23 per cent. Furthermore, women’s representation in energy policy is limited, from the top national positions right down to the local levels. In a 2013 analysis of 72 countries, only four countries (6%) worldwide—Gambia, Greece, Sweden, and Switzerland—had female ministers overseeing the country’s energy policies and programs. Comparing this to other ministries, 27 of the 72 countries (about 38%) had a female minister of environment or environment-related ministry such as agriculture or fisheries. And in comparison to national representation at global negotiations, the rate of female participation in official government delegations to the Conference of Parties (COPs) of the United Nations Framework Convention on Climate Change (UNFCCC) during 2008-2012 averaged around 30%.

A study by the European Institute for Gender Equality, (EIGE)²⁷ found that women hold about 25.6% of high-level decision making positions in the environment, transport, and energy sectors. The research also found that women’s participation is higher in the environmental sector than in energy and transport, and the same holds true for parliamentary committees on these topics. The Figure below displays the percentage of women in high-level positions in ministries responsible for the environment, transport, and energy in EU countries as of 2011.²⁸



Source: Data collected from Member States August–October 2011

Note: Total percentage of women in high-level decision-making related to climate change in Ministries responsible for the sectors of the environment, transport and energy, by Member State: in Italy, the level 2 position in the energy authority was vacant at the time when the report was prepared; for the energy sector in Romania, level 2 data have not been confirmed and level 3 data were not available from the institution.



Women’s participation at the political level has resulted in greater responsiveness to citizen’s needs, often increasing cooperation across party and ethnic lines and delivering more sustainable peace. At the local level, women’s inclusion at the leadership level has led to improved outcomes of climate related projects and policies. On the contrary, if policies or projects are implemented without women’s meaningful participation it can increase existing inequalities and decrease effectiveness.

Gender and Climate Change – https://unfccc.int/gender_and_climate_change/items/7516txt.php

Women’s representation is estimated to be even lower at the local level. In Northern Africa, women make up 8% of local councillors, while the percentage reaches 30% in Sub-Saharan Africa. Furthermore, women constitute less than 5% of mayors worldwide.²⁹ **The reasons for women’s low** participation are noted to be based on organizational and cultural structures, traditional views on the division of care responsibilities between women and men, and in educational choices.³⁰

FEMALE POLITICAL REPRESENTATION IN CANADA

On the Canadian stage, Prime Minister Trudeau promised gender-parity and appointed 15 men and 15 women to serve as his council of ministers. Women make up half of the total of his 31-person cabinet (including himself). This Cabinet includes the Honourable Catherine McKenna, Minister of Environment and Climate Change and Canadian Foreign Minister Chrystia Freeland. At the Provincial levels, women are responding to climate change issues including: Rachel Notley, Premier of Alberta; Kathleen Wynne, Premier of Ontario; and, Premier Christy Clark.

“... because women often show more concern for the environment, support pro-environmental policies and vote for pro-environmental leaders, their greater involvement in politics and in nongovernmental organizations could result in environmental gains, with multiplier effects across all the Millennium Development Goals

Human Development Report 2011 – http://hdr.undp.org/sites/default/files/hdr_2011_en_summary.pdf



Benefits of Women’s Public Sector Involvement in Framing Policy to Enable Equity in Clean Energy and Sustainability

The business case for increasing gender equality in decision-making stems from the ideas and ideals of democracy and justice but also from the desire to have more efficient climate change policies that best serve the needs of society. Several bodies of work **show that women’s participation in environmental decision making leads to improved environmental outcomes. Thus, women’s participation is not only important for gender equality but may also determine the effectiveness and trajectory of clean energy growth.**

The 2011 Human Development Report³¹ found that:

- Countries with higher female parliamentary representation are more likely to set aside protected land areas, according to a study of 25 developed and 65 developing countries.
- Countries with higher female parliamentary representation are more likely to ratify international **environmental treaties, according to a study of 130 countries with about 92% of the world's population.**
- Of the 49 countries that reduced carbon dioxide emissions between 1990 and 2007, 14 were countries ranking very high on the Human Development Index (HDI), 10 of which had higher than average female parliamentary representation.

Gender equality in decision making comes down to not just being elected, but being perceived to have legitimate knowledge and contributions.

Women as Corporate Executives, Board members, and Project managers

The limited number of women in energy policy and public sector is also echoed in the private sector. In Canada, women also continue to be underrepresented on the corporate boards of Canadian energy companies.³² A **Globe and Mail report from Fall 2014 found that, of Canada's largest 251 companies in the S&P/TSX composite index, 55 per cent of the energy companies had all-male boards.** By way of comparison, 42 per cent of mining and forestry companies and 16 per cent of non-resource companies had similarly one-dimensional boards. These numbers exist – *and persist* – in spite of the growing body of evidence showing the considerable benefits of including women on Boards.

Benefits of Balance in Decision Making

The employment of women on an equal basis would allow companies to make better use of the available talent pool, with potential growth implications. There is a well-documented body of evidence that shows the links between the presence of more women on the board and increased profitability, return on investment and innovation as well as the adoption of a development and rights perspective, collaborative processes, and enhanced communications. New efforts have emerged to understand the benefits of diversity and gender equality in decision making in the private sector, which could be applied to the clean energy industry:

- Research by Catalyst on the largest corporations in the US, some of which have a global reach, found that companies with three or more women on their Board enjoyed higher financial performance, including on equities, investment, and sales, than companies with no women on their Board.³³
- A study by the MIT Center for Collective Intelligence analyzed group decision making and found that diversity leads to better decisions, due to three factors including how many women are in the group. The study drew on the fact that women are sometimes stronger at reading **non-verbal cues and ensuring that everyone's voice is heard.**³⁴
- A study led by the Center for Responsible Business at UC-Berkeley found that companies with more women on their board of directors are more likely to **"proactively invest in renewable power generation and related services... and measure and reduce carbon emissions of their projects throughout the value chain and implement programs with their suppliers to reduce carbon footprint."**³⁵

- Research by Goldman Sachs found that in the BRICS countries (Brazil, Russia, India, China, and South Africa) and “the next eleven” countries⁴, narrowing the gender gap in employment could increase income per capita as much as 14% by 2020 and by 20% in 2030.³⁶

Some companies are beginning to apply these lessons by engaging men in gender equality initiatives, working on retention and promotion of women, setting accountability goals, adapting management training, and launching diversity and inclusion initiatives all in an effort to improve the work environment for women and increase representation.

On March 8th, 2017 EHRC and the Honourable Maryam Monsef, Minister of Status of Women, recently announced EHRC’s newest initiative to support the increased representation of women as skilled workers in the electricity and renewable energy sector. The Leadership Accord on Gender Diversity for the Electricity Industry is a public commitment by employers, educators, unions and governments to promote the values of diversity and inclusion within their organizations. Whether it’s through recruitment, retention or governance practices, the signatories to this Accord acknowledge that united action is required to ensure the support of women in the industry, along with equality and fairness for the entire workforce.

“I applaud this initiative by Electricity Human Resources Canada. By working together with employers in the electricity industry, they will help build a workplace culture that attracts, supports and promotes women at all levels. This is more than just an investment in women — it is an investment in the future of the industry.”



Maryam Monsef, Minister of Status of Women - <http://bit.ly/2mmJdJQ>

Other similar campaigns at an international level include, a Parliament-led campaign in the UK called POWERful Women has set a goal of 40% of energy company middle management to be female, and 30% of executive energy company board members to be female, by 2030.³⁷

Women in Science, Technology, Engineering and Math Fields

The underrepresentation of women in renewable energy in many countries, including Canada, is noted as part of a bigger problem of the underrepresentation of women in Science, Technology, Engineering and Math (STEM) fields despite significant progress in education, labour force participation and efforts to attract them into these areas. According to the 2011 National Household Survey (NHS), women accounted for 33% of STEM university graduates, but almost two-thirds of graduates in non-STEM fields.³⁸ Accordingly, the proportions of women in scientific

⁴ N11 countries or the Next 11 countries refers to a group of eleven countries - specifically Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, Turkey, South Korea, and Vietnam - which have emerging markets that could potentially become some of the worlds largest economies. Goldman Sachs. (May 12, 2015). *N-11 Equity Portfolio* [Online]. Available: http://www.goldmansachs.com/gsam/docs/funds_international/brochures_and_sales_aids/fund_literature/advisor_brochure_n-11_en.pdf

occupations remained significantly lower than in other occupations, especially among those that normally require a university degree.

Most future green job creation in Canada will be in occupations in which women are currently underrepresented, such as engineering, yet a Statistics Canada report published in 2011, noted that women comprised just 23% of engineering graduates aged 25-34. Women make up more than half of the Canadian population but are significantly underrepresented in the engineering profession; less than 13 per cent of practicing licensed engineers are women according to Engineers Canada.

Since workers are likely to transition from jobs in the “brown” economy (which is heavily male dominated) to the “green,” it is a self-fulfilling prophecy that women will also be underrepresented in green jobs unless gender equity in employment is planned and implemented proactively. Recent media reports confirm this trend, indicating that laid-off oil and gas workers in Alberta are beginning to find employment in the renewable energy sector.

Benefits of Women’s Advancement in STEM

Canada has a strong demand for engineering now and well into the future according to Engineers Canada. While benefits can be realized in engaging the best minds in the profession (which includes women) in terms of overcoming skills shortages, increased innovation capacity and a greater return on human resource investment - it will ensure the sustainability of the profession and its ability to understand the public it serves. There is also an obvious economic benefit for women who choose to pursue these paths which pay relatively higher wages on average. While wage inequality also exists in STEM jobs, it is a smaller wage gap relative to men. Women in STEM jobs earn 33 percent more than those in non-STEM occupations. The gender wage gap in STEM jobs is roughly 14 percent, while the gender wage gap for non-STEM jobs is 21 percent.

Engineers Canada is dedicated to increasing the participation of women in the engineering profession by identifying initiatives that attract greater numbers of women to engineering, promoting their retention in the profession and demonstrating the value of diversity and inclusivity in engineering education and in the workplace. **30 by 30 - a key component of the above objectives is 30 by 30, Engineers Canada’s goal of raising the percentage of newly licensed engineers who are women to 30 per cent by the year 2030.** Projects under the 30 by 30 banner also include **nationalizing efforts of outreach programs such as the Ontario Network of Women in Engineering (OnWiE)’s Go ENG Girl and collaborating with the WinSETT Centre to increase women’s access to leadership training.** Engineers Canada is also a proud supporter of the biennial conference of the Canadian Coalition of Women in Engineering, Science, Trades and Technology (CCWESTT).

Women in Skilled Trades

Reports from around the world warn of a looming skills gap as industrialized and emerging economies retool their existing industries and seek out new opportunities. In virtually all areas of energy development, there are impending retirements, skills shortages and calls for additional training. These shortages cover a wide range of different occupations, from engineers and architects to skilled trades, equipment operators, technicians and even construction laborers - occupations in which women are currently underrepresented.

The new 2015 National Apprenticeship Survey (NAS)³⁹ found that apprentices continued to be mainly young men who were born in Canada. There was a notable underrepresentation of women in these programs, with women accounting for only 14% of apprentices. The primary occupations filled by women have remained consistent over time and **continue to be jobs stereotypically defined as “women’s work.”**⁴⁰ The majority of women do not work in sectors that require skills and training in science, math and technology.⁴¹ Barriers for women interested in pursuing apprenticeships according to the Canadian Apprenticeship Forum include a lack of information about apprenticeship and career pathways, limited awareness of existing preparation programs, limited encouragement to take math and science courses and lack confidence in their abilities, discrimination when trying to find employers/sponsors, family obligations, lack of mentors and unwelcoming workplaces.

A recently published study which uses 2011 census data to examine the current gender make-up of jobs that will likely be generated in the clean energy sector in New Brunswick, found that women accounted for a very small **percentage of those currently employed in “representative jobs” in building retrofitting, wind, solar and advanced biofuel production, mass transit freight rail expansion, and smart grid.** In representative jobs in building retrofitting, for example, women comprised only 3.9 percent of managers, 2 percent of carpenters, 1.3 percent of electricians and 0 percent heating/air conditioning installers, roofers and building inspectors.⁴² Female representation in some of these occupations according to this same report had actually worsened since analysis of previous census data from 2006.

The prevalent social construction of “women’s work” according to consultation participants that makes it hard to change assumptions and implicit bias about what men and women are capable of. For example, the growing size of wind turbines that requires climbing many meters high, and the potential electric shock associated with large solar installations may bring certain safety risks that are presumed to be more difficult for women.⁴³

Benefits of Women’s Advancement in Skilled Trades

There is evidence of specific benefits to projects when women are employed in skilled trades. Women who pursue apprenticeships in skilled trades benefit from job opportunities, full-time employment, improved incomes, and exciting and interesting careers.

From a global perspective, when women are the ones operating heavy mining equipment such as trucks and excavators, companies in Chile, Ghana, and Papua New Guinea have noticed that women maintain the machinery better and operating costs are lower⁴⁴. Several countries have instituted training programs to increase the number of women in infrastructure-related employment. Brazil is among the countries that have launched training programs for women to secure technical jobs in infrastructure projects⁴⁵, and Haiti’s **Ministry of Rural Works trained women to use heavy earth-moving equipment for road construction jobs.** Liberia set a **30% quota for women’s employment in infrastructure reconstruction** in order to boost the economy, by providing women with income to develop new economic endeavors.⁴⁶ New York City found success in securing 10% of apprenticeships for women and 15% of jobs for women on construction sites by setting targets with developers, contractors, and unions.⁴⁷

Women as Entrepreneurs, Vendors & Suppliers

The founder of Women in Renewable Energy (WiRE), a Canadian non-profit organization dedicated to advancing the role and recognition of women in the RE sector, revealed that of its membership base of over a thousand women in the province of Ontario, at least 10 percent were entrepreneurs.

There is great potential in the economic opportunities and revenue streams provided by large-scale clean energy programs, including for entrepreneurs, vendors, and suppliers. But to change existing gender imbalances, it is important to be proactive to provide more and better information about entrepreneurship as an attractive career option and identify and support women-led businesses so as to provide examples of female leaders in the sector.

Strategies to Expand Women's Entrepreneurship

While women often manage credit and finance at the household level, they face concrete constraints to translating those skills to entrepreneurship, including access to credit, loans, information, education, markets, technology, and financial systems. A recent research initiative of the United Nations Foundation and ExxonMobil, Featured in A *Roadmap for Promoting Women's Economic Empowerment*⁴⁸, discovered lessons for overcoming these constraints, which could be applied to the energy sector. As suggested by this report, one way that renewable energy projects **could incentivize women's entrepreneurship is to consider gender certification** of vendors, suppliers, and other partners in the procurement process for these services. In Mexico, the National Institute for Women has found success with a program to certify gender equitable enterprises in both the private and public sectors, with participating entities reporting higher worker performance and productivity, reduction of gender gaps, and promotion of women to managerial positions.⁴⁹

Another recommendation that emerges across the gender and energy literature (and echoed by consultation participants) is the importance of helping women who are energy entrepreneurs. Successful champions are also needed to build visibility of women in this sector. For those willing **to take the plunge, resources like Canada's own MaRS' science, technology and social entrepreneur incubator** and dedicated networking groups for women business leaders have helped to bring gender balance to clean tech.⁵⁰ Globally, Women in Oil and Energy South Africa (WOESA) promotes business opportunities for black women in South Africa in collaboration with the government.⁵¹ One outstanding example in Asia is Dr. Wandee Khunchornyakong, the Chief Executive Officer of **Thailand's largest solar farm developer who has been called the "solar queen of South Asia."** She started Solar Power Company Group (SPCG) in 1993, and it currently has 36 solar farm projects. Dr. Khunchornyakong won the 2013 Women Entrepreneur of the Year award from Asia Pacific Entrepreneurship Awards and has committed herself to developing the next generation of women entrepreneurs in the industry.⁵²

6. PROFILES OF WOMEN WORKING IN THE CANADIAN CLEAN ENERGY SECTOR

Around the world, a number of key initiatives are underway to ensure that women become more visible in dealing with the international climate impacts, financial gains and policy shifts that are moving us closer to a collective clean energy future. Studies and reports (including this particular body of work) show that one of the reasons women are reluctant to enter clean energy careers or to remain in energy roles once they have started their careers is a lack of role models and knowledge about the breadth of opportunities available in the sector.

In building upon the key messages outlined in the previous section to this report, what follows attempts to bridge that gap by building awareness of the important roles that women can play in the clean energy sector by shedding light on the stories, challenges and vision for opportunity of female champions in the sector from a cross-section of sub-sectors, occupations, and years of experience.

Merran Smith, Executive Director, Clean Energy Canada

Merran Smith is the executive director of Clean Energy Canada and a fellow at the Simon Fraser University Centre for Dialogue. For decades, she has worked to unite industry, government, and civil society organizations to solve pressing social and ecological challenges. Her leadership in the landmark Great Bear Rainforest conservation agreement helped ensure the protection of thousands of kilometers of British Columbia's coastal ecosystem.



She is the founder of Clean Energy Canada, the nation's leading climate and energy think tank on clean energy solutions. Merran is currently one of Canada's representatives on the International Clean Energy Ambassador Corps, and served on BC's Climate Leadership Team in 2015. She is also a 2016 recipient of the Vancouver Board of Trade 'Wendy McDonald Award' for community leadership, and a 2014 recipient of the Clean 16 Award for Leadership in Clean Capitalism. "I'm honored to be recognized along with so many talented and successful women working in clean energy," Smith said. "It's such an exciting time to be working in clean energy—this sector will be at the forefront of innovation in the years ahead, so I'm delighted to be part of this effort to encourage more young women to consider careers in this field."

Favorite innovation in clean energy and/or what she is looking forward to the most in this field

My favorite innovation is the continued drop in the price of solar and wind, making it cost competitive with fossil fuel electricity in many parts of the world, and making it the right choice for developing nations who are building electricity systems for the first time!

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

"I have been respected and treated as an equal in this sector but I have often been one of the only women in the room which can be lonely. I also find that the sector would benefit from more women just to increase the diversity of perspectives in the room. That said, I rarely ever bring up or discuss the issue of gender in my professional environment as I don't want my work and my opinions to be viewed differently than anyone else's in the room i.e. Have people thinking gender before evaluating what I'm contributing."

Top challenges faced in navigating the industry and action taken to overcome these

"I can't say that I've had any challenges related to gender. That said, from time to time things happen - it can be tedious to be 'man-splained' or be at conferences listening to 'man-el' after 'man-el'. It makes me frustrated that the great women aren't recognized for their work and contributions."

Opinions on the representation of women in the sector

"On the positive side, I find that if the issue of gender balance is brought up, the men respond well and are willing to consider doing something about it. That said, I am disappointed that the sector hasn't even recognized that there is a lack of gender equity. As the sector is young and still overcoming many challenges it is understandable that it isn't top of mind but as a newer sector I am hoping that it is more 'modern' than the traditional energy sector which remains male dominated even today."

What employers should be doing to Recruit More Women?

"Make it clear in hiring processes that the role will welcome women or men. Also, profile your women employees more. Send them out to speak at the conferences rather than their male colleagues. This may mean giving women a chance who may have less experience but have the aptitude to learn the skills. And the same goes with the media or other public facing events. Make it clear to the world that your company values female employees as well as male employees."

Elisabeth (Lisa) DeMarco, Senior Partner, DeMarco Allan LLP

Lisa DeMarco is Senior Partner with [DeMarco Allan](#) with over two and a half decades of experience in law, regulation, policy and advocacy relating to energy and climate change. She represents several governments and leading energy clients in a wide variety of natural gas, electricity, pipeline, and energy storage matters before various regulatory tribunals, including the Ontario Energy Board and the National Energy Board. She has been an adjunct professor at Osgoode Hall Law School and lectures regularly. Ms. DeMarco also assists leading Canadian energy companies on domestic and overseas power project development, renewable power projects, alternative fuel projects, cleantech development and finance, energy storage, carbon capture and storage, corporate social responsibility, environmental disclosure, clean energy finance, **and sustainable business strategy. She is ranked by Chamber's Global as one of the world's leading climate change lawyers and regularly attends and advises on United Nations Climate negotiations. She is ranked and repeatedly recommended by Lexpert, Expert Guide, International Who's Who and Chambers Canada as a leading energy (oil and gas) and environment lawyer.**



Ms. DeMarco has advised multilateral development banks and energy companies on deals and projects in India, Brazil, Sri Lanka, Thailand, Argentina, Chile, Peru, Ireland, Africa, Mexico, China, Russia, California, Alberta, Ontario, British Columbia, and Quebec. She plays an ongoing and active role in the development and drafting of energy and greenhouse gas emissions policy, regulation, and law throughout Canada, and in various countries around the world. **She was appointed to the Premier of Ontario's now completed Climate Change Advisory Panel and continues to serve as an appointed member of Ontario's Clean Energy Task Force and Climate Action Group. Ms. DeMarco is a member of the Board of Directors of Ontario Power Generation and the Toronto Atmospheric Fund Investment Committee.** She is currently on the editorial board of the Carbon and Climate Law Review. She is a graduate of the Western University (BSc. Hon. 1990), the University of Toronto (MSc. 1992), Osgoode Hall Law School, York University (LLB 1995) and the Vermont Law School (MSEL, *summa cum laude* 1995). She is called to the bar in Ontario and England. Lisa is also holds an ICD designation from the Institute of Corporate Directors.

Where it all began

Lisa's entry into the renewable energy sector goes back to her articling and graduate/scientific work with Fisheries and Oceans Canada on the biodegradation of oil spills. This work was followed by articling with the then provincial Ministry of Environment and Energy. Lisa then moved into private legal practice as a partner in global law firm heading up energy group and a global climate group. She moved on from there to start her own firm where she is Senior Partner.

In speaking about what drew Lisa to the clean energy sector, it was the intersection of economic regulation and the use of economic instruments for an environmental/societal outcome she notes that had the most pull on her. In addition, being able to bring to bear her educational and science background to the energy field and law played a key role in laying down the path for her. In Lisa's words she was the only nerd who understood these aspects.

Where she is going

In terms of long-term career aspirations in the sector Lisa noted that climate change is an area of strong interest and belief. *"I have a very strong personal passion towards efficient, effective and cleaner energy future - it is what gets me up in the morning. Doing so in such a way that is profitable, respects first nations and is socially just - sustainable writ large - from human capital, economic, and environmental perspectives. Having been on the floor of UN negotiations on the Paris Agreement it felt pretty damn good to stand up on behalf of all business – we are much stronger together. This is a strong personal passion."*

Favorite innovation in clean energy and/or what she is looking forward to the most in this field *"Having some fun with energy storage. We have established the Advocacy Council of Energy Storage Canada – I love the potential disruptions that that can cause to result in much more efficient, effective, sustainable energy both within North America and other jurisdictions that are just starting to energize. Energy Storage would be broad to include electric vehicles, all forms of technology, flywheels, pumped hydro, battery storage, hydro ladders – I really love the implications for transmission and distribution – that's my current baby. Also First Nations equity in energy resources is a real push right now – energy poverty and addressing this in way that makes financial/business sense."*

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

In Lisa's experience, she commented that there is certainly no doubt that it is still an extremely male-dominated sector in terms of energy /regulatory litigation. Disheartened, Lisa pointed out that are likely only two female lawyers (maybe three) who are established partners that litigate in energy regulation across the country.

In Lisa's words, *"it has its moments (like being called Chicken Little or hysterical on the transcript records) but also by and large there is a whole cast of very supportive male colleagues who have been great mentors throughout the years."* Such mentors include Lisa's former Director in government and some of her current now male colleagues in the industry who were very supportive and helpful when she decided to start her own firm. Needless to say, Lisa commented that *"there are still the Stalwarts, "the Dougs", the old utility guys out there who stand in marked contrast to some of the other really helpful men. By and large it has not been without issue/ challenge but also very rich/very fortunate with the support that I do have – I am very grateful."*

Top challenges faced in navigating the industry and action taken to overcome these

Lisa noted a number of off-record examples of workplace discrimination and harassment she has experienced. In addressing those challenges she offers the following advice: *"you can't take yourself too seriously – if you are playing*

with the big boys you need to be able to laugh stuff off all the time and throw it back." Also, "find your sense of humor don't take yourself too seriously but also don't be afraid to draw a few lines"

Opinions on the representation of women in the sector

Reflecting on this question, Lisa commented that "It is a problem that I assume some responsibility for - I have tried to keep more young women in energy regulatory/clean energy law and have been largely unsuccessful- the hours are **very long and really quite grueling and tough.**" To combat some of these challenges, Lisa noted that within her firm Maternity leave policies were established, separate rooms for nursing identified so that when women would like to return to the workplace and still nurse they had a space to do so. *"I fought really hard for the advancement of women through partnerships and can't seem to keep young women particular in energy regulatory litigation."* Part of this also, she notes, is that "[you] have to be really prepared for some of the guys to throw a few ad hominem at you and "go for your jugular" every once and a while leaving one to question why am I doing this when I can be practicing corporate law at a bank."

Representation is definitely an issue according to Lisa who is the only female lawyer now and this is her firm. Lisa notes that she started with a few women and now they have left law to do consulting with many of them commenting that they *"don't want [their] hours to look like [hers] in terms of how much [she] works."*

In terms of pay equity, Lisa commented that historically when she was with her first law firm pre- merger the pay was **outstanding with a number of the top ten lawyers ""on the grid" were women** – it was definitely a meritocracy she says and that the organization was way ahead of its time.

Following the merger Lisa recalls a very strident and noteworthy discrepancy between male and female partners (less equity-based). All but one of the senior female lawyers in the energy space left. *"Was pay equity a factor? Yes - Was it the only factor? No – there was definitely that "old school" male dominant culture – more than male-dominated it was old school "entitled" culture. Very shocking."*

People, Organizations or Programs that have helped with Professional / Personal Growth

For Lisa, her Director was extremely supportive of her and in supporting women in general. Lisa also reiterated that she has several male colleagues who have gone out of their way to include her in programs that they are undertaking or arranging e.g. conferences through the [Northwind Professional Institute](#) who provide uniquely tailored forums for senior business executives and policymakers in a wide variety of sectors. These colleagues she notes were very instrumental in ensuring she was invited on regular basis. One of these same colleagues was the one who when he found out Lisa was going out on her own offered to help.

What employers should be doing to recruit more women

"By and large, we've seen some movement on the diversity in the broader workforce; however, we are doing a terrible job at getting women in senior leadership positions where they can lead by example." Lisa also noted that there are very few women on Boards of Directors where compensation in human resources and scorecards are evaluated against leadership pay. *"These two things are really necessary to change and affect meaningful diversification of workforces."*

Lisa commented that it goes beyond women though – *“it is also people of color, those of different gender identities, sexual orientation – goes beyond the male/female issue.”*

Offering flexibility is also key according to Lisa sharing that a few times she almost quit the industry when returning to work with both of her children. *“It was the worst few months in my life where I felt very divided in going back. It is our nature really to want to be the perfect mom – it was extraordinarily tough going back to work with my kids.”*

Most Important message

“What you are doing is very important, there is an issue and we need to find a way to address it. I am very supportive of organizations like EHRC who are looking at these issues and challenges and making efforts to come up with mechanisms to recruit and retain (that is the issue) more females in the clean energy sector and very specifically those in the C-Suite in energy sector.”

Is there anything else that you would like to share or other areas that we didn't discuss but you think are important?

Lisa noted that in the mining/resources sector (writ large) is where there would likely be the most challenges e.g. harassment and that we need to come up with ways to deal with and support women effectively in dealing with this. *“We would be remiss if we didn't include something but it needs to be addressed in a way that doesn't scare women out of the industry.”*

Annette Verschuren, Chair & CEO - NRStor Inc.

Annette Verschuren, a native of North Sydney, Nova Scotia has taken her wealth of unique experience and well-rounded skill-set in finance, operations and leadership and applied it to public, private and non-profit ventures throughout her career.

Annette is Chair and CEO of NRStor Inc., an energy storage development company created in July 2012. Within two years of launch, Verschuren, at the helm as chair and CEO, spearheaded the installation of Canada's first commercial grid-connected energy-storage flywheel — a mechanical battery that stores electricity using kinetic motion and which is typically used to balance energy on the power grid on a short-term basis. The start-up also partnered with Opus One to bring Tesla's Powerwall home battery to Canada in 2015. She has been and influencer of policy and worked to create a market for advanced energy storage in Ontario.



Ms. Verschuren is a board member of Liberty Mutual Insurance Group of Boston, Air Canada, Saputo and Canadian Natural Resources Limited. In addition, Annette is a board member of CAMH Foundation and the Rideau Hall Foundation and the MaRS Discovery District. **Additionally, Annette Verschuren sits on the federal government's Science Technology and Innovation Council.** She co-chairs the Smart Prosperity Initiative which is mapping out a course to a stronger, cleaner economy for Canada.

In 2011, Annette was honored as an Officer of The Order of Canada for her contribution to the retail industry and Corporate Social Responsibility. In 2010, she was appointed **co-chair of the 2012 Governor General's Leadership Conference, Canada's premier leadership training event.**

A champion of community investment and volunteerism, Annette serves as Chancellor of Cape Breton University and **chaired fundraising efforts for the University's new Verschuren Centre for Sustainability in Energy & the Environment (VCSEE).**

Annette holds honorary doctorate degrees from six universities including St. Francis Xavier University, where she also earned a Bachelor of Business Administration degree.

Annette Verschuren recently wrote a business book "Bet On Me", leading and succeeding in business and in life, published by Harper Collins. Annette and her husband, Stan, live in Toronto, Ontario. She returns frequently to her familial roots and long-time home in Cape Breton, Nova Scotia.

Where it all began

Annette began her career as a development officer with the Cape Breton Development Corporation, a coal mining operation, in Sydney, Nova Scotia. She then worked with Canada Development Investment Corporation as executive vice-president, privatizing crown corporations, before **joining Imasco Ltd., one of Canada's largest holding companies** in financial services, retail and food services, as vice-president, corporate development.

Formerly she was president of The Home Depot Canada and Asia, overseeing the growth of the company's Canadian operations from 19 to 179 stores between 1996 and 2011. She also led The Home Depot's entry into China. Immediately prior to joining The Home Depot, Annette was president and co-owner of Michaels of Canada, a chain of arts and crafts stores, where she opened 17 stores in 26 months.

After stepping down from The Home Depot and marrying long-time partner Stan Shibinsky, the couple booked themselves a one-year trip around the world, visiting much of Europe and Southeast Asia. It was considered **Verschuren's first real vacation since she was a child. During her travels, she learned a great deal about the environmental issues plaguing the world, in particular those surrounding food, water and energy.**

Inspired by what she saw on the road, Verschuren set out to make a difference in the energy sector by co-founding NRStor.

Favorite innovation in clean energy and/or what she is looking forward to the most in this field
"Storing energy in the way we store food and water."

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

Annette commented that she has “survived” in male dominated companies, coal mining, privatization, corporate development, retail industry. *“They have been challenging but nonetheless rewarding.”*

Top challenges faced in navigating the industry and action taken to overcome these

Annette identified the following as the biggest challenges within the energy and electricity industry which she noted as being dominated by men 1) Lack of diversity of thought. 2) Being underestimated (which can be an advantage). 3) Risk averse.

Opinions on the representation of women in the sector

According to Annette overall the level of representation of women is poor in the sector – although there is a slightly better level of representation seen at the mid-level management. Nonetheless, these low levels of representation, she remarked, are especially prevalent in the clean tech start-up industry.

What employers should be doing to recruit more women

Annette commented on the importance of ensuring senior leadership commitment to recruiting more women into the industry. In her words, it is important to *“take the same risks that you do with men. Get men to be the champions. Focus your people on an inclusive culture where people from different backgrounds work together.”*

Jane Kearns, Senior Advisor, Cleantech & Physical Sciences - MaRS Discovery District



Jane is a senior advisor with MaRS Cleantech. She is a recognized leader in sustainable innovation and has extensive experience growing companies at the intersection of business and sustainability. She co-founded, grew and profitably sold a full-service renewable energy company, Clean Energy Developments. Jane’s specialties include: sustainability, renewable energy, energy and resource efficiency, relationship management, strategy development, clean technology (including water, manufacturing, smartcities, agriculture tech transportation technologies), technical team management.

Throughout her career, she has advised entrepreneurs and executives on project and equity financing, mergers and acquisitions, strategic planning and business development. She helped launch Columbia Business School’s first environmental finance course, which continues to be taught in the school’s MBA and EMBA programs, as well the School of International and Public Affairs. Jane is the co-founder of the Canada Cleantech Alliance, a board director at the Water Technology Acceleration Project (WaterTAP) and sits on advisory boards for the MaRS Catalyst Fund, Shell’s Quest Climate Grant and the Pembina Institute’s UnGALA.

Jane holds an MBA from Columbia University, as well as undergraduate degrees from the University of Western Ontario and the University of Calgary.

Where it all began

Jane's entry into the sector started in finance. Upon graduation from Columbia Business School, Jane held one of a handful of jobs in New York in the clean tech/ environmental finance field. A number of years later she moved to Toronto to work for a clean tech venture capital company which she subsequently left to start Clean Energy Developments. Instantly, Jane was catapulted from finance to entrepreneur. Jane remarked that it wasn't anything specific that drew her to the sector. *"I had a real interest in doing something good for environment, being from Alberta (oil and gas). It took me a while to find my path doing something good for the environment. I didn't know exactly what I wanted to do, but knew that my path to improving environmental outcomes was through business. That's why I went to business school"*

Jane leverages over 120 years of experience in the environmental finance, cleantech and sustainability sectors to help build businesses that matter. She now helps other entrepreneurs – including women - in her role at MaRS get a foothold in entrepreneurship. In sharing her journey, Jane emphasized the critical importance of engaging more female entrepreneurs in clean tech. *"Across all sectors of cleantech - not just energy - there are almost no female founded and female led companies!"*

Where she is going

Reflecting on her long-term career aspiration in the sector *"I love my current role working with entrepreneurs. It is a bit hard to imagine what might come next.. I really like working with entrepreneurs and feel like I am able to make a change for the better. And I like the people that I work, both at MaRS and in the broader sector. It is a supportive network where everyone is trying to build something to make the world a better place.*

Favorite innovation in clean energy and/or what she is looking forward to the most in this field *"Although it is not energy, I really like Carbon Cure. They use carbon dioxide to make concrete. It makes better concrete, and at the same time permanently sequesters the CO2, which is important the fight against climate change. The CEO, Rob Niven, is very strong, the technology is excellent, and the climate benefits are important*

Canada also has some crazy stuff going on, like General Fusion in BC. They are working hard to do nuclear fusion – instead of breaking atoms apart like in fission (traditional nuclear reactors), they are instead joining two hydrogen atoms. In this process some of the mass is converted to energy. To make this reaction possible, General Fusion is building massive lasers that shoot down at a small piece of plasma, raising the temperature up to 150 million degrees Celsius – the temperature needed for the fusion to take place. It is kind of mind boggling. What they are trying to achieve is very bold. While they may or may not make it work in the long run, if they do, it will completely change the energy landscape – it could essentially provide emissions free energy to power world.

Temporal Power has developed an ultra-low friction flywheel that provides short-term energy balance for the grid, including frequency regulation and voltage management. Because it can absorb power and then feed it back to the grid very rapidly it allows the integration of intermittent clean energy on to the grid. And unlike with chemical batteries, the flywheels don't degrade with each charge and discharge.

Opus One Solutions is also doing very interesting things. Their real-time operating system enables energy management across the grid, from electric utilities right through to the end customer. Their technology is really important for grid management, and enabling up to 100% renewable generation onto the grid. There really is great technology being developed by Canada's energy and cleantech entrepreneurs!"

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

Jane commented that the sector is definitely **male-dominated, something she didn't realize at first.** *"It was always me and a bunch of dudes in the boardroom. I think there are some reasons for that. One of the things we need to do as a country is to think really hard about why it is that we **don't have more women going into the technical side of things.** We have lots wanting to be sustainability consultants or environmental lawyers and lots with the technical skills but I think we **need WAY more young girls interested in sciences.**"* Jane cited that research shows if girls are not interested in STEM by Grade 3 they won't even try after that. *"I feel like if we don't get more women into the technical side of things it is going to be very hard to get more women into senior leadership role within **companies.**"* **It's different she says when you are going into a big company with roles for Marketing and HR and some technical aspects as well. However, when speaking about small companies they hire "all guys all the time because they are looking for very specific technical skills, not generalists. Therefore, it is very hard from, what I have observed from the clean tech companies I work with, to get women into those companies as they are not technical enough. The ones that do come out with the technical background tend to be conservative and go to work for the large engineering firms, mining, and oil and gas companies - the big guys - instead of the more entrepreneurial side of things."** Jane commented that MaRS has 4 out of about 200 cleantech CEOs that are women. *"It shows a clear gap – and also a clear opportunity – for women. But the current state of affairs makes me sad."*

Top challenges faced in navigating the industry and action taken to overcome these

In building Clean Energy Developments, Jane shared that the majority of hires were males who in most cases were **making two times the salary that she was making, even as the founder of the company, and the "right-hand man"** to the CEO she hired to lead the company as it grew. In an attempt to voice her concerns over this disparity, she recalls being met with the response *"you have a husband to look after you, these guys have families to look after."* Jane categorized this as a very **"generational perspective."** *Sadly she says, it still exists "like hires like – guys tend to hire guys with similar backgrounds and expertise because they are comfortable with them. Women therefore face a bit of an uphill battle as it is such a male-dominated sector – energy in general."* In addition, Jane sees the challenges previously noted with sometimes limited technical skills amongst women, or these women choosing to have more job security and work instead of large corporations.

In an effort to overcome these challenges, Jane commented that while she has not benefited from this herself, **"mentorship goes a long way. And not just mentorship, but actually advocating on behalf of talented women."** She cited the [#GoSponsorHer](#) social media campaign in which senior business leaders (men and women) step up – not just mentor but to sponsor and advocate for women *"to move up the ranks. This is definitely effective if you get the right people on board doing things like this then it makes it harder to ignore young women."*

Jane also sees the value in building a women's network *"lots out there like Women in Renewable Energy (WiRE), Women in Solar Energy (WiSE) and others – women can support women. We need to build our women's networks, build our overall networks – there is only so much a bunch of women banding together can do – men must be a part of the solution, too."*

Opinions on the representation of women in the sector
 For Jane there simply are not enough women in the sector.

People, Organizations or Programs that have helped with Professional / Personal Growth
 Jane sees herself on the ***“bleeding edge of industry”*** whereby it was always her and guys. There was never any community, mentoring, she also never worked for big companies. ***“I think big companies and their mentorship programming and training are really important - I wish I had done that. I think I may have been exposed to more mentoring opportunities. I literally had no support in this journey - something I didn’t realize until I looked back. No wonder it was so painful! MaRS is great, though. There is a lot happening here for women, women entrepreneurs, women in science and getting youth into science and involved in entrepreneurship and giving them the leading edge in renewable energy. There is lots happening here now for entrepreneurs and for women.”***

What employers should be doing to recruit more women
 With the caveat that she has not worked in a big corporate culture, Jane noted the following to be of importance:

- Advocates
- General diversity training to have understand its benefits, increases in productivity and communication
- Having managers trained and “looking out for red flags”

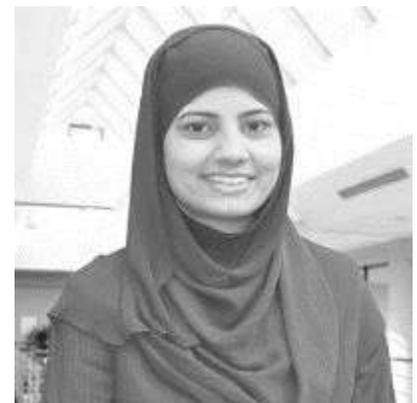
Most Important message

“The one thing that is becoming more clear is not just getting more women into engineering and science – we have to get them interested EARLY as they won’t go into engineering, physics, math if they have already developed a fear of it – we need to be thinking pre-university if we want to change what it looks like down the road – it’s going to be long and slow getting there. It’s not an easy change.”

Aisha Bukhari, Clean Energy Specialist, Electrical Engineer & Entrepreneur

Aisha Bukhari is an engineer and entrepreneur, currently working as a clean energy consultant. She also serves on the advisory committee for Women in Renewable Energy and on the board for Action Canada

Aisha spent the formative part of her career at Toronto Hydro. In her engineering role she led development and implementation of smart grid solutions, including installation of an urban community energy storage system. In her business development role, Aisha worked on the mergers and acquisitions portfolio. Most recently, Aisha co-founded Attollo Social Enterprise, an education technology startup.



Aisha holds a BAsC in electrical engineering from the University of Toronto, an MEng in electric power engineering from the University of Waterloo and an MBA from the Rotman School of Management, University of Toronto. She is also an Action Canada fellow.

Where it all began....

Aisha's interest in the sector began during the completion of her undergrad in electrical engineering. In her third year of studies she recalled one of her professors speaking about power and energy systems which sparked her interest. As a result, she enrolled in all the available power related courses. Following this time, she attended a variety of technical information sessions related to power hosted by the Institute of Electrical and Electronics Engineers (IEEE). The more she learned about what was happening in the industry the more interest this generated.

Prior to graduating, Aisha completed an internship at Honeywell Aerospace and while not within utilities it was related to power electronics. After graduation she knew that she wanted to work in the energy sector with a focus on the electricity grid. *"I wanted to work on something innovative and customer-focused, with tangible results. I chose Toronto Hydro as they interface with end user and were just beginning to explore smart grid solutions."*

Where she is going....

Aisha has been working in the industry since 2008. Driven by her passion for climate change, clean energy, innovation and social justice she plans to continue working in the industry.

Favorite innovation in clean energy and/or what she is looking forward to the most in this field

Aisha's favorite innovation in the field at the moment is energy storage. In her opinion, energy storage is the "missing link" that will help us transition to a 100% clean grid. While there are currently technical and financial hurdles to be overcome, she is confident that these will resolve as technology matures and is commercialized. Her long-term hope is for Canada to have a clean grid where consumers can be 'in charge' of the way in which they generate and consume power. *"Looking forward to a grid that is clean and provides consumers with more choice."*

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

Aisha commented that some of the challenges she has experienced were not just reflective of the fact that she is a woman but also young and belonging to a visible minority. Despite these challenges, overall she says she has been fortunate enough to find good mentors, champions and sponsors (both male and female) which has left her with a rewarding and positive experience.

When she started in one of her jobs, Aisha noted that she was the only technical woman on the engineering floor. Having grown up with two brothers and having many male classmates and friends in university, she experienced a major shift in gender dynamics once she entered the workplace. In particular, she commented *that "once you go from being a junior/new-employee to a colleague, who is competing for projects and promotions that is when the dynamics change."*

Aisha remarked on a time when she approached a female manager and asked her to be her mentor to which she declined. This situation prompted Aisha to seek out a male mentor who became one of her biggest supporter and the model for her subsequent career progression in the sector.

Top challenges faced in navigating the industry and action taken to overcome these

For Aisha, one of the biggest challenges faced is not being taken seriously. *"We would be in meetings and I would say something and then my male colleague would say something similar and be taken more seriously."* As a way to overcome these types of situations, Aisha recommends *"keeping at it and getting things done in so doing you build your credibility – actions speak."* Once you have been working somewhere with a few projects underway she says it gets easier.

Aisha also notes that it is a challenge in getting to know people in particular as it relates to outside work activities e.g. many of the casual networking events she notes are held at bars however she does not drink. *"Because I am not drinking it creates another barrier."* In one instance, to overcome this challenge Aisha with the support of a number of male colleagues put together a dragon boat team to provide them with another avenue to share something in common, develop friendships and team building.

Opinions on the representation of women in the sector

Aisha commented that one of the misconceptions of women being underrepresented in the industry is that this is related to issues with the new graduate *"pipeline"* for hiring i.e. there are not enough women coming out of technical programs. Despite the fact that we could be doing better in this regard, Aisha has observed from the time that she has graduated until now that it is less about pipeline and more about the culture of the company.

"Women want to work at places, where they can do challenging and meaningful work, have equal opportunities, in a respectful and friendly environment" *"One of reasons why women don't stay in the sector and are underrepresented, especially at senior management levels, is that they leave because of toxic culture. These issues add-up over time and at one point the passion is no longer sufficient to continue working"*. Aisha stressed that, top leadership (not just HR) needs to do a better job in making workplace culture more inclusive and friendly for all - tone is set at the top.

What employers should be doing to recruit more women

Besides culture change, Aisha emphasized that employers need to meet the growing demand that people, men and women, want their work to be meaningful, socially and environmentally (going beyond the traditional corporate social responsibility initiatives).

"Women are more driven when they see their work is making a difference in the society. Reframing the goals of projects to be more relevant to societal needs is a great way to attract more women and is also good for business. The clean energy sector presents a huge opportunity because climate change is a global issue that impacts all of our lives."

Most Important message

"We need to get beyond talking about the discrimination issues and trying to address them just through the HR departments. Company culture is set at the top. Senior leadership, men and women, should take ownership on making the workplace inclusive for everyone regardless of gender, sexual orientation, race etc. On an individual level we can all start by treating those around us with respect and kindness and being an ally for those who are being marginalized."

Is there anything else that you would like to share or other areas that we didn't discuss but you think are important?

“Working in this industry is really exciting and rewarding. Clean energy is a growing sector with a lot of innovation and an opportunity to make an impact.”

Paula McGarrigle, Managing Director, Solas Energy Consulting Inc.

Paula McGarrigle is a professional engineer and industry leader in the renewable energy sector. Her experience includes project development, climate change, business development, and strategic planning. Paula is a sought after speaker and facilitator, as well as the current chair of the Calgary Economic Development Renewable Energy Advisory Committee. Paula was previously the head of Shell Wind Energy for Canada, and started the Suncor Alternative and Renewable Energy group before co-founding Solas Energy Consulting in 2009. Solas has advised on projects across North America and beyond, maintaining offices in Calgary, Alberta and Fort Collins, Colorado.



Paula’s academic background includes two undergraduate degrees from the University of Alberta, Canada: a Bachelor of Science in Biology and Chemistry and a Bachelor of Science in Chemical Engineering. In addition, Paula holds an **MBA in Finance from Queen’s University, Canada.** Paula is a member of **APEGA and the Canadian Wind Energy Association (CanWEA)** and the Canadian Solar Industry Association. She was invited by the British High Commission to work on sustainability as part of the 2002 G8 summit, and has been a participant in the National Roundtable on Energy and the Environment (NRTEE).

Where it all began

Paula decided to get into the sector in 1999 since it seemed a lot more interesting than the opportunity to move to Sarnia and work at a refinery - a choice that her employer wanted for her; however, she was keen to stay in Calgary. Her first degree in biology inspired her to think more holistically about energy than a second degree in engineering. She was intrigued by the emerging sector at that time.

Favorite innovation in clean energy and/or what she is looking forward to the most in this field

“I am looking forward to renewable energy being mainstream and the general population to have a broader understanding of this energy source.”

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

“Oh boy, I’m 50 and I’m an engineer that should say it all.” Paula’s Biology degree was about 50/50 ratio; however, in her engineering degree she remarked that she was one of only six women in her class of 60 in chemical engineering (“about 5% of all engineering grads were women at the time.”) Paula’s entire working career has been male-dominated. *“I’ve endured sexual harassment, sexism and most of all people underestimating me. I like to surprise them though and have no tolerance for harassment or sexism now. When I was younger I was more interested in fitting in.”*

Top challenges faced in navigating the industry and action taken to overcome these

In Paula’s opinion, the renewable energy industry is highly complex and involves all aspects of people, planet, and profit *“I love this complexity”* she says. *“The challenge is to stay on top of a growing industry to understand the complexity, the evolution of the approaches, the technology advances, and what is happening in the world.”* In order to overcome this, Paula cited that she networks extensively, reads and ensures that she is connected and understands what’s going on. *“I am learning everyday despite being in the renewable energy sector for 18 years.”*

Opinions on the representation of women in the sector

According to Paula, there are fewer women in the industry than other industries. However, she notes that the women in this industry are *“top class”*. *“I have created a networking group in Alberta called W3 for women in the industry to network, to support each other, and develop strong connections.”*

What employers should be doing to recruit more women

“It’s pretty simple, they should recruit more women!”

Stephanie Landers, Communications and Public Relations Advisor – Ontario Waterpower Association

Stephanie Landers is the Communications and Public Relations Advisor for the [Ontario Waterpower Association](#) (OWA), a position she has held since 2013. OWA represents the common and collective interests of the waterpower industry in Ontario. Membership includes generators, engineering firms, environmental consultants, legal, project financing and insurance firms, Aboriginal communities and many other organizations. Stephanie is responsible for OWA's communications and public outreach strategies and often plans and supports member tours/events all over Ontario in order to engage, outreach and expand **the public’s understanding of the value of waterpower – the province’s primary source of renewable energy**. Stephanie also sits on the Advisory Committee for [Women in Renewable Energy \(WiRE\)](#) and leads the Marketing Committee.



Over the past 14 years, Stephanie has worked in the private, public and non-for profit sectors and has gained valuable experience in several environmental fields, including renewable energy, natural resource sciences, municipal waste management, forestry, recreation and outdoor education.

Her education includes completing a four year Bachelors of Science Degree with Honours in Environmental and Resource Science which she obtained from Trent University in 2012, a 2 year College Diploma in Therapeutic Recreation and Leisure (graduated 2007) from Niagara College, and 1 year College Certificate in Human Services

Foundations (graduated 2005) from Fanshawe College. While at OWA Stephanie is working towards her Certified Association Executive (CAE) designation from the Canadian Society of Association Executives (CSAE).

She believes that smart, environmentally conscious policy planning and sustainable development will be the key to modernizing infrastructure, tackling environmental challenges and strengthening communities/economies. Specifically, Stephanie believes that public outreach and education will play an extremely vital role in the success of this technical and environmental transition.

Where it all began

An environmentalist at heart, Stephanie's interest in the sector started in her 20s when she was in the outdoor education field working at an outdoor center and wanted to go back to school after completing a few years of college right after highschool. She decided to go into Environmental Sciences due to her love of outdoors and an epiphany while working in therapeutic recreation that the earth needed protecting in order for people to enjoy recreation and leisure and in turn a healthy lifestyle.

Stephanie went to Trent University for Environmental Science, and while in school worked in the Environmental Field for a municipality (the County of Peterborough), specific to rural waste management on a contractual basis for five years. While in University she had a strong desire to work in the renewable energy field, but did not know how to do it (aside from taking energy science classes).

After her final contract was complete with the County, where she developed strong public outreach and communications skills, she searched for work for about a month. A position with OWA for a *Communications and Public Outreach Coordinator* came up as a 1 year contract with funding support from the Career Focus Program (Canadian federal program). The job was to develop and implement communications and public outreach strategy. Once the 1 year contract was over, the OWA hired Stephanie on full time as they saw the value in enhancing communications and how it was paying off. She is now in her fifth year with OWA.

Where she is going

Stephanie loves the environmental field and validated that renewable energy could very likely be a long-term career for her, although she expressed an interest in exploring other opportunities within the environmental sector - not specific to hydro.

Stephanie noted being very passionate about the environment and sustainability. *"While majoring in Environmental Science in University you are educated on all the environmental challenges human beings face today. At the time we were just starting to dig deep into climate change challenges and how they could be addressed – clean energy emerged as the solution. One of the most daunting challenge we face in our lifetime is Climate Change– a challenge that will require a highly skilled workforce to work together in partnership to fix something that seems so far beyond our control"* says Stephanie.

Climate Change exacerbates any already existing environmental challenges. It seems like such a large obstacle that it is almost impossible to fix, which is why she wants to tackle it. Stephanie loves complex issues and working together with bright minds to try to solve them to the best of her abilities.

Favorite innovation in clean energy and/or what she is looking forward to the most in this field
 With regards to the future of the energy industry and innovation, Stephanie is most excited about all the new technologies emerging such as micro-hydro (typically produce from 5 kW to 100 kW of electricity using the natural flow of water. Installations can provide power to an isolated home or small community). Stephanie is also excited about seeing the incorporation of environmental factors in old clean energy. **In her words we are “at the tipping point of innovation and technology - these really are exciting times.”**

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

Stephanie mentioned that she was “surprised” at the division of gender. Upon entering the field, one of the first events she attended she recalled looking around and realizing, apart from being one of the few under 30, she was the only woman in the room. The event (designed to generate publicity) was attended by ‘high-up’ CEOs, senior level management and the Minister. What was eye-opening about this event for her was the woman behind the scene “running the show”. It was a reminder that this still exists/happens. In terms of the work environment, Stephanie mentions that sometimes it can be “a bit of an old boys club” amongst many of the operators/technicians in the water power industry. In her opinion, a lot of the time that generational mentality comes to play.

Top challenges faced in navigating the industry and action taken to overcome these

Based on her experiences, Stephanie started to research whether or not some of the challenges faced are being experienced more broadly in the industry and as such was introduced to Women in Renewable Energy (WiRE) in 2013. Part of her motivation for joining WiRE as a marketing lead was to ensure that waterpower was represented at the table amongst other clean energy through outreach and communication. In this role, Stephanie actively promotes women in the sector to reduce the gender gap. Leading by example, Stephanie realized that she is actually the mentor, noting that women need to see those mentors in the field.

Opinions on the representation of women in the sector

Stephanie has observed that women tend to be employed in Administrative – *“they are the organizers, the ones who ‘keep the wheels rolling’ behind the scenes”* without getting the recognition they deserve. She noted that she is unsure if **this is simply a function of past generations with women “naturally fall into these roles.”**

People, Organizations or Programs that have helped with Professional / Personal Growth

For Stephanie, WiRE has helped her to see other women in the field who are her age (or older), providing her with an opportunity to make connections, learn from firsthand knowledge and **experience. “These women have a hard work ethic, it is nice to see and feel the connections – helping the next generation.”** **The OWA also has woman on the Board of Directors (Valerie Helbronner – Partner at Torys LLP, Heather Ferguson - Vice-President of Environment at Ontario Power Generation (OPG) and Karen McGhee -P.Eng. & President at McGhee Krizsan Engineering Ltd), who Stephanie admires.**

What employers should be doing to recruit more women

In reflecting on the question, Stephanie explained that **she doesn't think employers are not trying to recruit** - most employers in her opinion want more diversity - **it's that women don't know what to do to get in.** *"We need to fix it from the bottom up" she said down to the high school level (education).* For her personally, even at the University level she was thinking about a career path in clean energy **but didn't know how to get in.** **When asked about mentorship initiatives,** Stephanie sees its value in providing individuals with an opportunity to pass on and receive advice.

Her own mentoring experiences have included WiRE mentoring programs one of which is an informational interview program whereby you are linked with someone who wants to be in the field. She has also participated in an Association of Power Producers of Ontario (APPrO) Speed Mentoring event in collaboration with WiRE. The program aims to connect established leaders (men or women) in the Ontario power sector for one hour with promising young minds eager to enter the field.

In addition, OWA hosts its [Power of Water Canada Conference and Tradeshow](#) which provides networking activities and the opportunity to make connections. WiRE provides bursaries to students with demonstrated interest in renewable energy, academic achievement, work experience and potential for future contributions to the renewable energy community to attend this conference. At the last conference, Stephanie recalls a student who attended who she keeps in regular contact with to share job opportunities that pop up. Employers need to continue hosting such events in order to provide women with opportunities to engage in conversation and receive advice.

Most Important message

In Stephanie's opinion, we are naturally changing the diversity of the industry. *"For women wanting to get into the field I would tell them that it is possible – to ensure that they network and work hard towards their goals! Have confidence. Believe in yourself and don't be intimidated by the fact that there are more men."*

Is there anything else that you would like to share or other areas that we didn't discuss but you think are important?

"All in all, I don't feel discouraged – if anything I feel more motivated! Whenever I see something that needs improvement, this just motivates me even more. Renewable energy and work diversity are both transitions that will be inevitable."

Joanna Osawe, Business Development Manager – Major Projects at DMC Power; Co-Founder & Co- Chair of Women in Renewable Energy (WiRE)



Joanna Osawe is the Business Development Manager – Major Projects at DMC Power Inc. and Co-Founder & Co-Chair of Women in Renewable Energy (WiRE), a Canadian-based group which encourages and supports women to enter this dynamic field. WiRE is inclusive and educates on all renewable and emerging energy technologies with chapters in Montreal, Ottawa, Toronto, Calgary, Edmonton and British Columbia. WiRE regularly organizes educational field trips

(open to men and women), monthly networking meetings, an awards recognition program, student mentoring and bursaries, communications and engagement initiatives.

DMC Power Inc. is the perfect marriage for Joanna. DMC Power works with major utilities, EPCs, BOPs, IPPS, owners, developers, LDCs and consulting engineers on substation and transmission projects in North America and globally. DMC Power has been involved on 85% of the Renewable Projects in Canada as well as numerous Wind Energy and Solar Projects in the United States. The Swage Connection Systems, invented and perfected by DMC Power, allows connections to be made with the push of a button. Customers around the world appreciate the safety, speed, reliability, quality and performance of Swage Connections over other traditional methods.

Joanna attended Western University studying Languages, Graduating with an Honours BA, Joanna has used her language skills on a focused, 15+ year management career at leading renewable and energy sector companies in Canada and the United States. By carrying complex projects through many stages she has seen firsthand the vital role renewable energy and emerging technologies serve in moving the Canadian, American and Global energy mix forward.

Where it all began

The first time Joanna saw wind turbines operating on the landscape, she immediately developed a passion for the energy sector and began the natural progression to building her career in this sector. Joanna has worked on the renewable development side, P&C (protection and control), SCADA and is now working for DMC Power in supplying connectors for the Substation and Transmission segments.

Where she is going ...

"I love the energy sector and will retire in this sector!"

Identified Challenges and Opportunities

Joanna prefers to frame what stands behind and before her as opportunities that make her stronger. These include the opportunity to become a better facilitator, businesswoman and negotiator – skills and knowledge that her male colleagues have been instrumental in helping her foster.

Opinions on the representation of women in the sector:

"When I first started out there were not as many women in this industry. And even today, while the numbers are not as strong as I would like, it reinforces the need to continue to tackle STEM education opportunities for all. Organizations such as WiRE, EHRC and C3E/NRCan will be crucial in motivating and supporting women in the STEM sector going forward."

What employers should be doing to recruit more women

An inclusive employer would retain a recruitment firm detailing their initiative to hire women and align with organizations such as WiRE, EHRC and others to post job listings. "We are coming in at the right time to solidify and promote the industry." Joanna sees the importance of educating the public not only on the opportunity for women in the energy industry, government or both in tandem, but also educating the general public about the sector at large.

People, Organizations or Programs that have helped with Professional / Personal Growth

In reflecting this question, Joanna attributes her greatest growth and learning to the privilege of being part of the renewable industry since its infancy. "I learned a lot because of how young the industry was; everyone was in the same boat, experiencing the same effects, stakeholders and programs through federal and provincial government."

Most Important message

"Networking is key. Involvement in organizations of like-minded people with the same passion as you creates more educational and professional growth opportunities for everyone."

Is there anything else that you would like to share or other areas that we didn't discuss but you think are important?

"It is important to continue to grow partnerships with WiRE, EHRC and different organizations to promote and market for one another. WiRE congratulates NrCan & EHRC for this body of work to journal and document the experiences of women in the sector."

Eryn Stewart, Clean Energy Project Manager – Lumos Clean Energy Advisors

Eryn Stewart is a Clean Energy Project Manager at [Lumos Clean Energy Advisors](#). At Lumos, she leads activities in the areas of community energy planning, community engagement, energy-literacy, and project management. She is also the Program Manager of the [20/20 Catalysts Program](#)- an interactive Indigenous clean energy capacity-building program.



Eryn's professional pursuit with Lumos Energy is to provide sustainable energy development opportunities for Indigenous communities through clean energy, while providing energy education and leadership opportunities for community members. She is currently undertaking initiatives in this area with both Gwich'in Council International and the Nunatsiavut Government.

During the first stages of her career, Eryn Stewart boasts an array of accomplishments having worked at Indigenous Affairs Northern Development Canada, Suncor Energy Inc, and the GLOBE Series- **Canada's largest conference** dedicated to sustainable business. Eryn has also been a research assistant for David McLaughlin, former CEO and President of the National Roundtable on Environment and the Economy, and music artist, Jack Johnson, on his social and environmental marketing campaign.

Her education includes:

- University of Waterloo, Honours Environment and Business Co-op, Environment and Business 2010 – 2015
- University of Wollongong, Bachelor of Science

Where it all began

Eryn's entry into the renewable energy sector, she recalls, was an interesting one. She was studying at University of Waterloo and enrolled in the co-operative education program. Eryn notes what she has always been interested in the energy sector at large so she decided to pursue work placements in the field. Eryn had an opportunity to work at Indigenous and Northern Affairs Canada working in environment and lands.

Following her co-op placement, Eryn accepted a position as Asset Management and Network Planning Intern at Suncor Energy in the Oil & Gas sector followed by work at Independent Electricity System Operator during her thesis writing.

What really drew Eryn to clean energy was the opportunities for Indigenous communities. She saw firsthand how **some communities felt about oil & gas and the 'backlash' that ensued. In charting her next 'move' therefore she** wondered about other potential social and economic development opportunities that were outside of oil – this is when started to research more into clean energy. **During her 'research', she met Chris Henderson, President of Lumos Clean Energy Advisors and Canada's pre-eminent Clean Energy Advisor to Indigenous communities.** Chris authored the book, *Aboriginal Power*, published in 2013 which talks about how the clean energy sector is growing and what this means for Indigenous communities. In reading the book, Eryn felt that clean energy represented success stories as well as the potential for reconciliation. In approaching Chris she was not really looking for a job at the time but was hired and has been at Lumos for the past two years. At Lumos, Eryn has the opportunity to manage and work on a variety of different projects that speak to her desire for social and economic development.

Where she is going

Eryn remarked that she is definitely in the sector for the long-term. *"Unless something else is really calling my name that could make bigger impact (which is not likely) this is a long-term career path for me. While my work might not always be related to Indigenous initiatives specifically, clean energy is definitely a long-term career pat."*

"There are great opportunities for growth in this sector for all. The fact that we have all levels of government talking about how we need to get communities off of diesel moving to clean energy from the community-level all the way up to the federal level is important." As we move towards more distributed energy resources Eryn sees this as an opportunity for continuous growth. *"There are so many areas we can go into – whether it's an NGO level, utility or public policy."*

Favorite innovation in clean energy and/or what she is looking forward to the most in this field Eryn commented that she has some really great projects on the go that she is excited to move forward including the [Illusuak Cultural Centre](#) being built in Nunatsiavut. As part of this project she is managing the install of a solar hot water and solar PV system and the installation of an energy education exhibit. Project taken from the ground up – personally excited.

In terms of tangibility, Eryn is intrigued by more community- centric energy design planning. What is most interesting she says in terms of technology is Biomimicry - an approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies. Eryn noted the example of a solar panel that opens up like a flower during the day/ closes at night. While this might not be economically feasible she says it is very **interesting**. *"What I love about clean energy/clean energy and clean tech generally is the amazing art components and creativity that can come into play – something that someone has to look at every day amazing what you can do to make it beautiful (beautiful for the planet in and of itself)."*

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

Speaking from her day-to-day workplace experiences at Lumos, Eryn commented that she is very fortunate to be working on a team that although all male (she is the only female) they are extremely supportive of her and her development. *"They realize some of the challenges with being a women in this industry and really push me to grow further - I feel very supported and I feel they really do understand."* In fact, Eryn noted that three of her male colleagues attended the recent March 8th event to show their support for women in clean energy.

External to her organization, and in reflecting on past positions, workplaces and networking events she has attended, Eryn noted that she finds it extremely intimidating often being the only woman in the room. In her opinion, she feels doubly-disadvantaged being younger and being a women. *"Some people assume automatically that you don't know as much as they do - I feel like I am often 'talked down to' or 'talked at' as opposed to having a dialogue. I think this comes with both of those things (age/gender) playing a factor."*

Carrying on this thought, Eryn noted that there is also the assumption that if you are not an engineer in the sector **there are things you just don't know about referencing the term "mansplaining"** (explaining something to someone, typically a man to woman, in a manner regarded as condescending or patronizing) – something she says she has experienced first-hand on a number of occasions.

Other assumptions regarding her role include situations where if she is the only woman in a meeting she is oftentimes handed the administrative tasks even though there is a more junior person present. *"It is assumed that it comes with 'women's work'."* A recent situation also found her in a meeting with one of the provincial Ministers who passed her over **with no acknowledgement or handshake thinking she was Chris Henderson's assistant.**

In reflecting on the nature of her work, Eryn noted that there are cultural differences between white and Indigenous communities in terms of how women are viewed and/or treated; however, this does depend on the community. Eryn commented that there are a number of communities that have strong female leaders (more in some cases than white communities) e.g. Chief and Council or the lead on projects. In these situations, Eryn said she felt supported. **Conversely, she has been in communities where she doesn't feel supported highlighting that trust is an additional factor to gender in breeding this mindset – "I feel a lot more comfortable and confident when I go in with some of my male colleagues."**

Top challenges faced in navigating the industry and action taken to overcome these

For Eryn, the biggest challenge is more of an internal one e.g. lack of self-confidence is something that she is working hard to overcome through the support of a professional coach. Part of this process includes talking about the issues she has experienced such as the assumptions held, her sense of intimidation in delivering presentations to a room full of 'men in suits' and general feelings around self-confidence. *"I feel like there is a lot of judgement coming my way- very prevalent because of the field I am in. I never had problem public speaking to my peers or to women as soon as I am in a room with men in their mid-forties to talk about clean energy – I panic."*

Additional strategies that Eryn noted that could help to overcome some of the challenges she and other women experience is the support of mentors.

Opinions on the representation of women in the sector

Reflecting on this question, Eryn commented that the statistics are really disheartening and that there is definitely a sense of old boys club. *"I want those numbers to increase and want more women in the sector but also see it as more of a challenge to overcome– as a sector we really have the opportunity to pave the way for others. While it's disheartening to see that there are not a lot of women –I also think of it as a real privilege to help pave the way."*

People, Organizations or Programs that have helped with Professional / Personal Growth

For Eryn, her current employer and the help of a professional coach have helped her to grow both professionally and personally in the industry. Eryn has also been engaged in conversations with WiRE including opportunities to speak at their events, more involvement with the organization and the opportunity to connect with female mentors.

Eryn is also involved in the [Arctic Remote Energy Networks Academy \(ARENA\) program](#) which focuses on sharing knowledge and establishing professional networks related to micro grids and integration of renewable energy resources for remote Arctic communities. As part of her involvement, Eryn has been paired with a mentor.

What employers should be doing to recruit more women

Employers should take action to brand the clean energy sector for what it is - that there is more benefits than just the bottom line. Although Eryn is of the opinion that many women already know this. *"It is really is about promoting all of the opportunities that are open in the sector at various women's events – e.g. EHRC, WiRE – to ensure that women know the breadth of opportunity in the sector."*

Most Important message

"Mentorship is the big one for me - it really is about seeing women in these positions that will encourage other women to get involved. Even starting as early as high school having women go in and talk about some of the interesting work that is being done. This could be really inspiring for young girls that may be thinking about this as a potential career choice – maybe they will choose a STEM path if not that's okay there are still other options."

Is there anything else that you would like to share or other areas that we didn't discuss but you think are important?

"The recent March 8th event was the first event of its kind that's been done that I know of– keep doing this! Nice to sit down with different women at so many levels and stages of their career to discuss the challenges you may be facing in the workplace and how to deal with this – found it really great been able to open up."

Pallavi Roy, Associate Advanced Energy Centre, MaRS

Pallavi is an Associate at the Advanced Energy Centre (AEC) at MaRS. She works on identifying opportunities and challenges for Canadian innovation in priority international markets. In her role, she also focuses on communicating thought leadership developed at the AEC to the energy community.



Pallavi is an energy and environment researcher. Pallavi is currently a member of Earth Day's Tapestry Leadership Program supporting diverse environmental leadership in Toronto and Canada. A passionate champion of environmental values, she believes in the power of people and communities to create a sustainable and better future.

Pallavi holds a Masters of Applied Science, Environmental Applied Science and Management from Ryerson University and a Bachelors in Chemical Engineering, BITS Pilani, India.

Where it all began

For Pallavi, her beginnings in the sector stem from her Masters studies which focused on energy and the environment. Prior to joining the AEC, she worked as a junior research fellow at the Asia Pacific Foundation of Canada. Her work focused on the Asia Pacific energy landscape and developing reports for industry and government stakeholders on maximizing Canadian energy opportunities in the Asia Pacific. Pallavi has also worked as a community animator and facilitator with numerous not-for-profits in Toronto. She previously spearheaded a project at CultureLink Settlement and Community Services, to promote environmental values among newcomers to Canada.

"It is an interesting area where a lot of change is required, especially from an environmental perspective and thus championing clean energy is important."

Pallavi plans to be in the sector for the foreseeable future. *"I enjoy working in the space of energy, it is evolving and also requires lot of change. I hope to be working towards bringing that change."*

Favorite innovation in clean energy and/or what she is looking forward to the most in this field
"Large scale adoption of decentralized generation."

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment
My experience in the sector has been good. I have met supportive people, who have helped me further my career and knowledge within this sector, especially with a focus on Ontario."

Top challenges faced in navigating the industry and action taken to overcome these

Pallavi identified the lack of information about the opportunities in the sector as one of her main challenges. This also comes from the fact that she has only been in Canada for 6 years she says. In order to overcome this she has focused on networking.

Opinions on the representation of women in the sector

Simply stated, Pallavi commented that we need more women in the sector.

What employers should be doing to recruit more women

In an effort to recruit more women into the sector Pallavi suggests providing flexible working options for women who have families; and , hiring people from not only engineering but other interdisciplinary sectors such as environmental studies, public policy etc.

Most Important message

"I do believe the problem starts early on than at a level where employers can intervene. Not a lot of women join streams such as electrical engineering, power electronics and hence very few women then go on to work in the sector."

As energy sectors evolve to be more closely intertwined with other areas, hiring people outside the traditional disciplines might be the key to getting more women joining the energy sector. "

Brandy Giannetta, Regional Director, Canadian Wind Energy Association (CanWEA)

Brandy Giannetta is the Regional Director for Ontario at the Canadian Wind Energy Association (CanWEA). A national non-profit industry association, CanWEA serves as Canada's leading source of credible information about wind energy and its social, economic and environmental benefits. Brandy

has served as CanWEA's Regional Director for Ontario since 2012 and is a well- respected leader of the Ontario based membership. On behalf of those members, Brandy undertakes policy development and advocacy with various levels of government, implements a broad range of communications and outreach activities, and supports educational and networking opportunities for CanWEA members and many other affiliated stakeholders.

Brandy has demonstrated on many occasions her understanding of the importance of collaboration and in her role she has successfully engaged a broad range of stakeholders in an effort to inform policy development and communications materials, contributing significantly to CanWEAs success. She represents CanWEA and its members on all occasions pertaining to the energy sector. Brandy also coordinates and oversees various working groups on regulatory affairs relating to environmental compliance, siting, energy procurement, and associated issues as they arise.



Brandy also holds a position on the Advisory Committee of Women in Renewable Energy (WiRE). The WiRE Advisory Committee consists of women drawn from sectors across the spectrum of renewable energy in Ontario. Committee members are tasked with building awareness of the group's educational and networking programming, and forging partnerships with supportive stakeholders.

More recently, Brandy has been appointed to the Independent Electricity System Operator's Stakeholder Advisory Committee to represent the constituency of Generators.

Brandy studied at the University of Ottawa and the University of Windsor and has a Bachelor of Arts in Political Science and a Master of Arts in Political Science and Public Policy.

Where it all began

Brandy has been working as an advocate for wind energy for only five years but feels like she's come full circle in her career path to land right where she is supposed to be...for now! As a political staffer at Queen's Park, she was exposed to the policy workings of many different sectors, none as dynamic as the energy sector however. After a few years in the private sector administering the Eco-Energy program, Brandy found herself at CanWEA where she could apply her experience and skill sets to advocate for wind energy with multiple stakeholders.

Where she is going

Brandy would like to remain working in public affairs within the energy sector. She has a unique skill set that allows her to be successful in advocacy, communications and strategic planning. The energy sector is dynamic and she fits right in – she has an affinity for building relationships and a drive to succeed.

Identified Challenges and Opportunities

Top challenges faced in navigating the industry and action taken to overcome these

Brandy has built significant public policy experience which is a very translatable skill set, no matter the subject or sector. Perhaps the greatest challenge has been honing those skills to translate to success in the energy sector. It was a steep learning curve at the beginning but the energy sector in Ontario is somewhere Brandy sees great opportunity to influence positive outcomes and that is something she will continue to enjoy striving for. Working with folks that have years more experience and relying on them to help navigate through the sector has been most beneficial in contributing to Brandy's experience and knowledge in this sector.

Opinions on the representation of women in the sector

Brandy was exposed to this dynamic early on into her foray into the energy sector. There were always more men than women in a room and the leadership was made up of seemingly all men. After attending a luncheon hosted by the Women of Wind Energy (WoWE), Brandy realized she had a responsibility to better understand this dynamic and contribute to changing the experience. Everyone has a voice – men and women alike - we all need to use it to promote one another.

What employers should be doing to recruit more women

Employers need to first understand the realities and benefits associated with gender balance. There should be a dedicated commitment to a principled approach within organizations to fully benefit from the pointed pursuit of top notch women as part of the team – from the top to the bottom and everywhere in between.

People, Organizations or Programs that have helped with Professional / Personal Growth

Working for a membership based organization has provided Brandy with the benefit of access to all facets of the wind energy sector as well as the broader energy sector. This has been invaluable in allowing her to hone her knowledge of the sector and leverage relationships to promote both personal and professional growth. Being involved with WiRE since its inception has also provided significant growth opportunities that Brandy has been able to reciprocate to others.

Most Important message

Don't ever stop building your network – it will be there when you need it most!

Is there anything else that you would like to share or other areas that we didn't discuss but you think are important?

Gender diversity is an evolving and growing strategy that more companies and organizations are capitalizing on. The energy sector is so dynamic and full of innovators, trail blazers and success stories. Women have such an important role to play in contributing to the evolution and growth of the energy sector. The future is ours and we will come out on top!

Brooke Longpre, Co-Founder/Owner Sound Solar Systems Inc.

Brooke Longpre is co-founder of Sound Solar and continues to be a positive advocate of solar photovoltaic solutions, particularly in the province of Saskatchewan. She is a creative, driven 38 year old entrepreneur with a versatile skill set. Experience in business management, leading a team of motivated individuals, performs project management & design with renewable energy technologies. Her knowledgeable and professional character has enabled many residential and commercial solar PV focused projects to move forward.

Experience in energy efficiency and project consulting she successfully creates and implements corporate strategies for the shift from fossil fuels. Excellent interpersonal and team-management skills along with strong leadership skills and 13 years of business experience in the financial and business industry.

Brooke is a driving force for electric vehicles and energy storage systems to build a better solar electric infrastructure in Saskatchewan and Canada. Her company is a member of the Canadian Solar Industry Association.



Where it all began

"It started at a breakfast meeting where I learned that solar panels on your roof could possibly produce all the electricity you need." She dove into a few months of research to seek out answers to a seemingly unresolved common sense issue. "I could not walk away knowing the magnitude of work that needs to be done and decided this industry needs someone like me."

Favorite innovation in clean energy and/or what she is looking forward to the most in this field

"Most all the technology platforms have the ability to provide real time data that produce quantifiable information. This helps create a large mechanism for people to understand the options and be empowered make changes in their lives."

Identified Challenges and Opportunities

Experience in a traditionally male-dominated environment

During Brooke's working career, it has been mostly male-dominated. "I enjoy working with good men. It's even better to be in a position to select the support team." She notes, "It is important to have a clear understanding of what you want to do and where your capabilities are. You must be able to adapt to any environment where there is little to no emotion." "Developing ways to deal with intimidation and fear is critical."

Top challenges faced in navigating the industry and action taken to overcome these

Brooke says, it takes an incredible amount of creative ability to navigate through the renewable energy industry. "It's always a challenge to remain diversified enough to accommodate rapidly changing technology that integrates into our lives. Whether you are building a team of motivated individuals or choosing strategic partnerships, the key is in some cases, is great mentorship and excellent negotiation skills."

Opinions on the representation of women in the sector

"Women representation in clean technology is small but mighty. My opinion is the recent past roles of women have been deployed to manage other important areas of life. The call to action in this sector has many tremendous opportunities with many different levels of expandable skills and abilities."

What employers should be doing to recruit more women

"Where possible, expand the working environment by implementing more options to create a home-based work platforms until children until the age of 5."

Additional Role Models & Stories of Inspiration

For additional role models and stories of inspiration please see Appendix B to this report.

WORDS OF ADVICE & INSPIRATION



Annette Verschuren, Chair & CEO - NRStor Inc.,

"Be bold, ask a lot questions, take math, engineering, etc. There is a lot of opportunity. Get experience and perhaps understand the gaps and start up a company."



Eryn Stewart, Clean Energy Project Manager – Lumos Clean Energy Advisors

"Don't let the clean energy sector intimidate you – people often associate the sector with needing to be an engineer. While I agree there needs to be more women in STEM occupations, there are a lot of other opportunities outside of engineering or engineering positions. It's really about having the audacity to go after those roles and know that you do belong in this sector."

Clean energy offers an opportunity to be more of a 'social game' rather than just being about the bottom line – this perspective really resonates with women's motivations and values. By being more inclusive of women this will only make the sector stronger. It really is such a great opportunity – the more people don't shy away from it the better."



Lisa DeMarco, Senior Partner

"Your network is incredibly important; however, this network should be diverse and not be made up of just women. There is also a process used by Obama's staff called "Amplification" - tried to amplify the voices of a number of women when coming up the ranks - when a woman made a key point, other women would repeat it, giving credit to its author. This is such a great idea to force the men in the room to recognize the contribution — and deny them the chance to claim the idea as their own."

While the process of amplification is key it is also important to mentor and champion people. Recently I did a talk at an energy conference where three of us spoke to your mentor and your sponsor – there are a number of women in the industry that I try to take under my wing in the same way that others have taken me under their wing – when you see opportunities you let them know. Also, there is an international 'secret society' the Hawthorne group made up of Senior CEOs. This is a very useful group we always try to find opportunities for each other - works quite well. That is largely amplification and networking."



Paula McGarrigle, Managing Director, Solas Energy Consulting Inc.

Network, network, network!



Stephanie Landers, Communications and Public Relations Advisor – Ontario Waterpower

Stephanie’s advice to women in the clean energy industry is simple – Be confident. By observation, Stephanie notes that men tend to act very confident, women on the other hand can have a wealth of experience but lack the confidence. *“Sit at the table, ask questions, don’t be afraid to share and voice your opinions.”*

Merran Smith, Executive Director, Clean Energy Canada

“Enter! Renewable energy is an exciting new sector that is a good business and contributes to a healthier planet. It is a vibrant new sector with lots of opportunities for growth.”



Jane Kearns, Senior Advisor, Cleantech & Physical Sciences - MaRS Discovery District *“Try to talk to at least one person a week when you are trying to transition given it is incredibly hard in particular as it relates to technical skills. It is one of the reasons why I am where I am – I don’t know if I would have gotten into this space because I do not have a technical background. It’s really really hard because these companies (particular with clean tech and startup) if they are hiring someone they are hiring a very specific skills set probably not going to be in communications. For a lot of people who have general interests in the business space, it is really really hard to get in.*

You also need to have thick skin – part of it is also knowing how to speak in a way that it gets you heard as opposed to ignored. I rarely feel like I’m treated differently than my male colleagues here, it is me and nine guys and they all spent two days talking over me. It’s no big deal for me as I know how to manage them; however, if you are young this would be incredibly discouraging. Reading the studies that show how women communicate versus men, how to speak so that we are understood would be of value.”

Joanna Osawe, Business Development Manager – Major Projects at DMC Power and Co-Founder & Co- Chair of Women in Renewable Energy (WiRE)

“This industry is very unique – it’s a lifestyle filled with passion. It is not just a 9-5 job - one must be serious about this as a career path. Network is also key in helping you enter and transition into the industry.”

In terms of representation in a variety of sub-sectors within clean energy I view clean energy is just another arm of energy sector with nuclear, mining, hydro, biomass, solar, wind as different and necessary source to provide energy for families – a belief held even in light of controversy that may come from various stakeholders opposing one form of electricity over another. When I first joined the industry we were welcomed with open arms, now the story is much different”





Brooke Longpre, Co-Founder/Owner Sound Solar Systems Inc.

“It is important to have a clear understanding of what you want to do and where your capabilities are. You must be able to adapt to any environment where there is little to no emotion. Develop ways to deal with intimidation and fear. Select good men.”

Aisha Bukhari, Clean Energy Specialist, Electrical Engineer & Entrepreneur

“Ask for what you want, be the best version of yourself and choose to do meaningful work that you are passionate about. Get involved with organizations such as WiRE which provide you with the opportunity to meet and learn from those who are currently working in the industry.”



Pallavi Roy, Associate Advanced Energy Centre, MaRS

“It is a very diverse sector, with a lot of options for women. Talking to people in the sector and identifying niches is useful. Organizations like WiRE are great to meet other women in the sector.”

Workshop Participants

“It’s all about confidence in yourself and whatever your interests are. Remember that you don’t have to know everything or be a perfectionist - just pick your passion and go! As women I think we are socialized to be perfect. When men apply for a position they will apply based on 40% of the bullets, women on the other hand feel they need to know 90% to apply for same job.”

“Don’t be passive but be bold – it’s okay to be bold!” Many times women shy away from opportunity and as a result end up giving it away to someone else. Take the stage! I recommend taking every public speaking opportunity that they get. You are going to be in a meeting where you have to speak and you don’t want to be paralyzed when you get that opportunity. This is a key skill - women need to apologize less and brag more and then you will fit in with guys.”

“Your career path is not linear – you don’t need to know where you will be at 50, if there is something that you are interested in go in that direction

“Go explore beyond what your neighbor and uncle does – explore opportunities where you may be even if you don’t know where you are going.”

“Be passionate about being your own driver not the passenger – go anyway and believe.”

“It’s not a choice between family and career”

“Be selfish and vocal in where you want your career to go”

“The future of business is sustainability; don’t give up on it”

“Be confident in your abilities”

“Don’t be passive!”



7. KEY RECOMMENDATIONS

There is tremendous potential to create livelihoods for women in the clean energy sector. The clean energy sector is perceived to be less discriminatory than the fossil fuels industry because it is a new and non-traditional field. And as noted there is some evidence that women are drawn to choose career paths that resonate with desires to make a difference in the world. The industry itself provides jobs that are stable and well-paying with good benefits and opportunities for continuous learning. Career pathways are such that individuals may have many different roles within their career.

With the present Canadian labour force aging and with anticipated labour shortages, the industry can benefit from proactively encouraging initiatives that support increased participation and promotion of women in the workforce. The economic prosperity of women can also be enhanced through improvements in representation in high-demand and -paying occupation and trades and leadership positions– prosperity that will trickle down from provinces, employers, and individuals to their families.

However, women can only gain traction from clean energy initiatives within the context of wider socially progressive policies and more transformative shifts in societal attitudes about gender roles. This is as true for developing countries and emerging economies as it is for industrialized nations.

Women face particular constraints relevant to clean energy employment, including their self- perception of jobs that are acceptable, a lack of role models, technical skills, and the long-standing gender wage gap.

Without appropriately targeted training, apprenticeships, employment placement, financial tools and supportive social policies, transitioning to clean energy may exacerbate existing inequities and hinder human development goals. The growth of the clean energy sector should benefit both women and men but we must be proactive about enabling women to establish a stronger equity stake

The aim of this report, including its founding research (literature review, interview consultations, case studies and March 8th workshop consultations) is to explore the gaps in knowledge and action for women in the clean energy sector to identify initial strategies for closing those gaps and establish a launching point for momentum.

Below are suggested recommendations for women’s advancement in employment, leadership and entrepreneurship in the clean energy sector. Recommendations draw from EHRC’s research - literature review, key informant interviews, workshop consultations and case study development.

Recommendation #1: Collect Comprehensive Labour Market Information (LMI) & Metrics

Collecting Disaggregating Data by Gender

One of the main challenges when considering how to boost female representation in the sector overall is the lack of solid, reliable and timely labour market data which paints a clear picture of the sector both overall and as related to workforce representation. Hence, there is a need to collect more gender-specific data as it relates to the clean energy sector. As this report, and the review of literature demonstrates, disaggregating data by gender on employment in

clean energy/clean energy is *extremely limited* everywhere in the world and practically non-existent in Canada – yet through our data exploration process widely sought after by key organizations which represent sub-sectors of the clean energy field. Although the employment effects of renewable /clean energy investment are increasingly gaining recognition in discussions on clean energy in Canada, specific analytical work and empirical evidence on this important subject remain extremely limited **related to women’s participation**.

One of the most pressing findings and thus recommendation from this review is the need to collect labour market data specific to the clean energy sector (and its subsectors) in order to inform evidence-based policymaking and programming for improvement – a recommendation echoed by other researchers⁵³ who have attempted to study employment issues in the sector. Further research aimed at documenting the gender gap in energy employment as well as informing strategies for promoting employment equity is of value. Furthermore, women’s participation rates need to be tracked to ensure progress over time is consistently measured.

Having access to sex-disaggregated employment data on specific renewable sources such as wind, solar, biomass, marine/tidal and geothermal would enable a better understanding of trends as well as to propose policies and interventions for promoting employment equity and gender equality. Disaggregating data by gender is crucial for **gender equality and women’s empowerment**. As research notes, without data, there is no visibility - and without visibility, there is no policy priority.⁵⁴

Efforts to engage in wide-reaching LMI data collection of the clean energy sector should be supported by a clear definition of the various sub-sectors that make up this field. Please see Section 2. A Changing Energy Landscape on page 9 for a breakdown of sub-sectors in which data should be collected and segmented (including Nuclear) through further research.

Recommendation #2: Create a Culture Shift

Shifting Societal Attitudes⁵⁵

There is a need not just for specific employment equity policies to address the gender gap in clean energy employment but also wider socially progressive policies, as well as, shifts in societal and organizational attitudes about gender roles in order for women to benefit optimally from employment in the energy sector. While this level of shift in culture will not happen overnight government and employers must also work to proactively develop and implement programming that attempts to change the nature of work environments that exclude women (creating a diverse team is not enough). More specifically, it is recommended that employers make a compelling business case that speaks to the economic value of gender diversity to their organization and make that effort one of the **company’s** top three strategic imperatives for growth. Corporate value statements that speak to their intent to be gender diverse are often just words and not enough to ensure a balanced leadership of men and women at all levels. Without a change in mindset there is no change in behaviour.

Having the leadership team ‘walk the talk’ when it comes to gender diversity is often not enough. Many women, early in their careers, become discouraged by a manager who may not recognize their value and contribution. It is therefore important to promote gender awareness training for managers to deepen culture change.

It is also important internally for organizations to portray the success stories of women leaders through intranet video stories, case studies, awards and internal newsletters - include reinforcing comments of male supervisors and peers. Externally, organizations can create an ongoing communications program through articles, stories, blogs, keynotes, etc., that positions their company as one that values and attracts the best and brightest women.

The Government of Canada can be seen as a leader in this not only domestically but on the international stage, continuing to demonstrate leadership to progressively move this agenda forward and encourage industry stakeholders to act upon the insights and recommendations collectively as contained within this report.

Recommendation #3: Engage in Greater Outreach & Awareness

Bridging the Gap to Clean Energy Possibility

The success of an organization is built largely on the talents of its people, and a diverse workforce is strongly linked to an ability to innovate and be an employer of choice⁵⁶. As such, many organizations are looking to improve the recruitment and retention of women in the sector as they recognize the significant opportunities to increase business productivity and innovation⁵⁷ **through increasing women’s participation in the sector**. These efforts should be further bolstered with the following:

Establishing Campaigns in Attracting Young Girls & Women to the Clean Energy Sector

Greater education participation, from an early age onwards, provides better economic opportunities for women by raising the overall level of human capital and labour productivity.⁵⁸ As suggested by literature and consultations establishing an interest in science and clean energy opportunities writ large is key to building the next generation of clean energy leaders.

Parental Encouragement: Of particular importance, is the expressed need to establish interest early in the learning cycle and encouraging children from an early age that they can do whatever they would like to do, regardless of gender. As suggested by consultation participants, it is important to start early when talking to daughter/sons about what future careers look like in the sector. Gender bias was noted to start early in the family therefore it is important that parents establish and build sufficient role models for children - showing young girls these opportunities exist and they can succeed.

Education Programming: Consultation participants commented that the problem in attracting more women to the sector does not solely reside with employers – *“there needs to be education of the opportunities”* which according to many should begin at a young age. It is important, they say to *“educate girls at an early age about the impact they can have on the world with this career path”*.

Numerous sources⁵⁹ document that by the time students reach fourth grade, a third of boys and girls have lost an interest in science. By eighth grade, almost 50 percent have lost interest or deemed it irrelevant to their education or future plans. At this point in the K–12 system, the STEM pipeline has narrowed to half. That means millions of students have tuned out or lack the confidence to believe they can “do” science.

Job and Career Path Awareness: Consultation participants emphasized the importance of letting young people know *“What a job looks like - what does an engineer actually do? How is it developing? What are the opportunities?”* A

number of initiatives were identified which could aid in providing young girls with the opportunity to learn and even experience more about the sector including: counselling, onsite school visits by university and college representatives, STEM camps e.g. Carleton engineering for girls summer program <https://carleton.ca/vv/programs/summer-camps/>, and the SHAD program <http://www.shad.ca/Students.htm>. Further, it was recommended that reports and documentation should be produced that identify existing opportunities in the clean energy space – in particular for women.

The Compassionate Connection - Promotion of Meaningful Opportunity: Consultation participants spoke to the importance of pivoting the clean energy sector away from a profit stance to one that is more social and meaningful - the opportunity to make a difference in the world and improve the quality of life a sentiment was noted to be something that speaks to the compassionate side of women when they are searching for a career.

Bringing greater awareness to Female Role models at all levels: This report merely scratched the surface on the limitless potential there is for women in this sector as demonstrated by those leading the way/profiled in this report. There is a clear need to provide more and better information about female leadership in organizations – at all levels - including information about entrepreneurship as an attractive career option, both for young women in school and for those new to the sector.

It should be noted that research participants referenced the need to support and profile those who are not in leadership roles, but are at entry level or mid-career, and do not necessarily aspire to the C-Suite. Furthermore, that we would be remiss to not **point out that there is often a noted misperception that clean tech is “just technicians, economists, engineers” when in reality there is a need for more women in all fields within the sector . The assumption,** according to those consulted, is that the leaders are from these groups. As a few consultation participants explained, ***“we need to be aware that this view has the disadvantage of ‘capping’ and inadvertently devaluing those who can be involved in the sector. We need to explain the breadth of occupations outside of STEM that can play a significant role within clean sector organizations and the sector writ large.”*** Not all women may have a STEM background or be engineers – there are numerous occupations needed in order to ensure the efficient and optimal function of the sector including, policy, communications, legal, and business.

Recommendation # 4: Improve Recruitment, Retention & Professional Development Efforts

Establishing Influential Best Practices

There are many ways that leaders can close the gap between their intention and behavior when it comes to gender diversity. A range of practices and supports to facilitate better recruitment, retention and development of women in the sector were identified and are recommended through this project. Women also need allies and advocates to help spread and support this message – allies from a broad spectrum of levels and occupations. Suggested practices and support include:

- **Modelling and Strategic Mentorship:** It is important to generate a strong female leadership pipeline for the sector. Consultation participants time and time again voiced their support for proactively introducing women to other women (as well as men) in leadership through such mechanisms as modelling and mentorship as part of overall employer recruitment/retention programs. This is especially critical in fields where there are few but highly talented and aspiring women. It was recommended that such an approach should be targeted towards youth/students (first and foremost) given the double-edged challenges experienced in being both young and

a women e.g. student association or program to connect first year female engineers students with older workers. Support should also be provided once in the sector as women navigate their careers. Some consultation participants noted the importance of targeted outreach to also include women who identify as a visible minority given the triple effect experienced in being young, a visible minority and a woman. Feedback from EHRC's own industry stakeholders independent of this study has emphasized the significant role that mentors can play in the successful attraction and retention of female workers in the sector through the work on its Connected Women Mentorship Program. In particular, creating cross-gender mentoring opportunities between male leaders and women at entry, mid-management, and senior levels to identify future high potentials, encourage retention, and target development.

- Sponsorship: Some research has shown that women are over-mentored and under-sponsored.⁶⁰ While mentoring is important to career success, having a sponsor is even more critical to advancement in the workplace. There is a special kind of relationship—called sponsorship—in which the mentor goes beyond giving feedback and advice and uses his or her influence with senior executives to advocate for the mentee.⁶¹ This includes such initiatives, proposed by consultation participants, as the [#GoSponsorHer](#) social media campaign. This campaign aims to put more women in senior roles by publicly pledging to champion a woman in her career and challenging other executives to participate. In essence, it was suggested by consultation participants that *“we need to move past mentorship and leadership and have both men and women “step up” and bring women into prominent and influential roles and positions.”*
- Summer employment opportunities and job shadowing opportunities: Such opportunities should be offered in a range of different occupations to ensure women and young girls are aware of the breadth of opportunity available in the clean energy sector i.e. not just those focused on engineering but those that include finance, communications, politics/policy, and entrepreneurship.
- Funding Scholarships & Bursaries: Greater leverage of funding scholarships or continual learning funds (bursaries) should be exercised whether through existing university programming or through the support of organizations who support the entry of women into the sector e.g. WIRE Student Bursaries <http://www.womeninrenewableenergy.ca/bursaries/>
- Internships: In particular consultation participants recommended the importance of such internships as it relates to start-ups due to start-up nature which sees relatively low hiring of young “lower level people.” Such efforts could be exercised in conjunction with such organizations as MaRS entrepreneurship group <https://www.marsdd.com/> and Start-Up Canada <http://www.startupcan.ca/>
- Hiring practices to Eliminate Bias: There are many gender blind spots in the recruiting process, especially when sourcing and interviewing candidates. In striving to hire more women through tangible efforts, consultation participants identified the importance of having women *“on the other side”* at the hiring table as it was identified that they may look for things in a candidate in a different way than men. It is also important to understand the different ways men and women approach the interview process including their differences in preparation, self-presentation, and responses to questions. Furthermore, it was suggested that employers could institute a blind interview process whereby there is no name or gender/religion associated with a candidate so as to remove any bias in hiring.

- Hubs that promote and advertise existing and upcoming opportunities: these hubs should pinpoint specifically and in more detail existing spaces and provide opportunities for upcoming professionals
- Amplification: **A practice promoted and adopted by President Obama’s female staff, the process of amplification** was adopted to ensure that female voices were being heard. Once a woman in the room made a key point other women would repeat it, giving credit to its author. This forced the men in the room to recognize the contribution — and denied them the chance to claim the idea as their own.⁶²
- Professional Development Opportunities: to support skills development such as W ISEST (Women in Science, Engineering and Technology).
- Tailored Coaching and Training: the need for coaching and training to addresses the unique challenges women face in the workplace that are essential to their advancement such as: how to be more assertive and ask and negotiate starting salary and increases.
- Female networking events & conferences: consultation participants spoke to the need and value of organization who host events and conferences which prioritize female involvement in clean energy as not only a draw to the sector but also an ongoing mechanism of support.
- Industry Partnership: working together toward a shared goal designed to benefit both those entering and already in the sector while at the same time, achieving goals unique to each partner was identified as an important mechanism for bridging gender gaps in the sector. Numerous organizations, including EHRC, have or are developing a variety of supportive programming and initiatives to help bridge the gender gap, including:



Electricity Human Resources Canada's Bridging The Gap – Women in the Workforce

With the support of industry and provincial governments, EHRC launched its Bridging the Gap project to examine the issues and barriers around the recruitment and retention of women into the electricity industry. Along with the research portion, this project also sought to develop practical solutions for employers and other stakeholders to overcome these challenges.

The tools and resources developed as part of the Bridging the Gap project can be used to support the industry in positively impacting the representation of women in the sector. At the same time, the results of this project can also act as a resource for women seeking more information on electricity and renewable energy careers. Further details on existing programs and case studies to enhance the recruitment, and retention of women can be found here:

<http://electricityhr.ca/workplace-support/recruitment-retention/bridging-the-gap/programs-studies/>

Electricity Human Resources Canada's Connected Women Mentorship Program

Feedback from EHRC industry stakeholders has emphasized the significant role that mentors can play in the successful attraction and retention of female workers in the sector. As a result, EHRC initiated its [Connected Women](#) project (funded through the Status of women) to develop and implement a national mentorship Program. EHRC is proud to announce the official launch of this program.

Mentors who take new workers 'under their wing' provide support to gain familiarity with corporate processes and policies, provide guidance and reassurance when it is required and pass on their knowledge and expertise to the next generation of workers. Defined networking and mentoring processes help to ensure that female workers have extra support and guidance, particularly when transitioning into the sector. This support is particularly key when entering a sector that has been traditionally populated by men and continues to see low numbers of women in the trades and/or STEM occupations.

Electricity Human Resources Canada's Leadership Accord – Gender Diversity in the Canadian Electricity Industry

The National Leadership Accord is an initiative borne out of our Connected Women Project. The [Leadership Accord on Gender Diversity in the Canadian Electricity Industry](#) (the Accord). It is a public commitment by employers, educators, unions and governments to promote the values of diversity and inclusion within their organizations.

The signatories to this Accord acknowledge that united action is required to ensure the support of women in the industry, along with equality and fairness for the entire workforce. This is a real opportunity for employers, and all those who support the sector, to actively engage in building an electricity workforce that is truly representative of **Canada's people**.

Women in Renewable Energy (WiRE) WiRE forges partnerships with a spectrum of renewable energy industry associations, professional women from across the energy sector and academic providers. Programming includes educational field trips (open to men and women), monthly networking meetings, an awards recognition program, student mentoring and bursaries, communications and engagement initiatives. The group is inclusive, and educates on all renewable energy technologies as well as emerging technologies.

<http://www.womeninrenewableenergy.ca/>

Women of Wind Energy (WoWE) **WoWE's mission to promote the education, professional development and advancement of women.** Programming includes educational fellowships, mentoring, online and in person, chapters and local gatherings across North America, recognition awards, and Annual Leadership Forum and informational webinars <http://www.womenofwindenergy.org/programs-and-services.html>

WISE is a 501(C)3 non-profit membership organization. Their mission is to promote diversity and inclusion in all aspects of the solar energy industry.

<http://www.solwomen.org/>

Solar Sister empowers women in developing to become entrepreneurs and replaces unhealthy forms of power with solar. Solar Sister taps into the power of women to deliver energy access directly to homes in the developing world. The Avon-style distribution system opens doors to greater health, safety, education and economic prosperity.

<https://www.solarsister.org/>

GRID Alternatives is leading a National Women in Solar Initiative to bring more women into the solar industry and support them in their professional advancement. GRID Alternatives has programs that specifically reach out to and recruit women. Solar Spring Break, for example, gets the word out on college campuses to expose students to internships and other opportunities. <http://www.gridalternatives.org/get-involved/solar-break>. GRID Alternatives also sponsors women and supports their professional development through the National Women in Solar Initiative.

<http://www.gridalternatives.org/what-we-do/workforce-development/women-in-solar>

The Hawthorn Club is an international network of female executives working in the energy field. A key aim of The Club is to promote and support the professional development of women to corporate boards. The Club is an international network of female executives, which exists for three purposes:

1. To be the foremost professional network for women in energy
2. To promote and support the professional development of women into senior corporate positions & boards
3. To facilitate increased gender diversity within the energy sector

<http://thehawthornclub.com/strategicaims/>

Recommendation #5: Improve Workplace Flexibility & Accommodation Policy

Developing Family Friendly-Policy and Workplace Culture

Since women's ability to take advantage of clean energy employment options and research is often constrained by social barriers that limit their participation it is crucial that social policies go beyond energy sector planning to optimize economic opportunities for women. At the employer level, it is important family-friendly human resource policies are developed and/or improved upon to ensure access to certain types of education and training and opportunities for advancement while remaining flexible and fluid to changing life circumstances. The key theme

when talking about retention issues is the expressed need for flexibility and accommodation in the following areas of policy, including:

- Professional engagement: those who take a break from their career should be given an opportunity to remain engaged with, and ultimately return, to their professional life.
- Maternity Leave: **At the forefront, workplace culture needs to “adopt to modern reality” as it concerns maternity leave.** Changes are needed so that it is seen as something positive rather than career limiting or a detriment to advancement - **where “it is the norm” that you must take time off if you have children. There should also be ‘institutionalized flexibility’ and respect for maternity leave** or the value of equal/ split partner maternity leave so that it is not just one person who is taken out of their career progression pathway.
- Work/Life Balance: Women are drawn to workplaces where they feel there is more flexibility. Policies are needed that support work/life balance such as affordable, universal child care and flexible working arrangements (**work from home, taking Friday’s off**) **to accommodate greater work life balance. As well employees should be offered (where needed) the opportunity to bring children to work to maintain balance as much as possible.**
- Day-to-day practices: It is important to hold meetings at times that are more accessible to women (in particular those with young children). As noted by a number of consultation participants in many instances *“it’s a lot guys having meetings – often scheduled early morning or late.”*
- Training and Conferences: Given the vast amount of research being generated by the sector it was suggested that organizers of events should put in measures to ensure women can attend. *“It is difficult if you have young children to travel to conferences, conference organizers should offer day care services - you need to have those supports. These are easy to put in place to accommodate parents.”*
- Culture of parenting and elder care: there is a need for honest discussion about parenting and elder care for all employees and the challenges **these bring in “[clashing] with professional life”** and productivity ebbs and flows.

APPENDIX A - CONSULTATION PARTICIPANTS

This report, consultation and best practice/case study process would not have been possible without the contributions and insights of the following (in alphabetical order) from a broad spectrum of occupations within the clean energy sector. Each of these knowledge leaders participated in one-on-one interview consultations during February/March 2017 sharing their experiences alongside the challenges and opportunities encountered in the sector.

- Aisha Bukhari, Clean Energy Specialist and Engineer
- Annette Verschuren, Chair & CEO - NRStor Inc.,
- Brooke Longpre, Co-Founder/Owner
- Sound Solar Systems Inc.
- Elisabeth (Lisa) DeMarco, Senior Partner, DeMarco Allan LLP
- Eryn Stewart, Clean Energy Project Manager – Lumos Clean Energy Advisors
- Jane Kearns, Senior Advisor, Cleantech & Physical Sciences - MaRS Discovery District
- Joanna Osawe | Business Development Manager – Major Projects – DMCPOWER and Co-Founder of Women in Renewable Energy (WiRE)
- Merran Smith, Executive Director, Clean Energy Canada
- Pallavi Roy, Associate Advanced Energy Centre,
- Paula McGarrigle, Managing Director, Solas Energy Consulting Inc.
- Stephanie Landers, Communications and Public Relations Advisor - Ontario Waterpower Association

Advancing Women in the Clean Energy Sector Workshop Participants

Additional thanks goes out to those who participated in the NRCan-sponsored Clean Energy Education Empowerment **Women's Initiative** - The Future of Energy: Moving Towards a Low-carbon Economy (Panel & Networking Event) March 8th, 2017 and in particular participants of the Advancing Women in the Clean Energy Sector workshop.

APPENDIX B - FURTHER FEMALE INSPIRATION

The following section provides *additional examples* of women leading the way in a variety of sub-sectors of clean energy:

Heather Kleb, President, Women In Nuclear Canada & Senior Program Manager, Bruce Power

Heather Kleb believes that nuclear power is the source of clean energy with the greatest potential to mitigate climate change. In her role as WiN-Canada President, **Heather aims to support women’s success in the industry. Heather began her career** in the nuclear industry as an environmental scientist more than ten years ago. In this role, she participated in regulatory hearings where she observed first-hand how public perceptions affect the industry and the communities where we operate.



In her recent roles with the Canadian Nuclear Association, including Interim President & CEO, she worked to create a positive public, political, and regulatory environment for the industry. She also supported WiN-Canada’s involvement in industry initiatives such as lobbying, regulatory interventions and executive leadership discussions. Heather is also on the Electricity Human Resources Canada Board of Directors.

Before nuclear, Heather spent nearly a decade working in mining and other resource-based industries after completing her Masters in Science in Ecology. Her work took her across Canada and around the world. She is currently a Senior Program Manager at Bruce Power.

“Having had the good fortune of being mentored by a female scientist and businessperson early in my career, I look for opportunities to encourage women as they enter the industry, supporting them in their studies and job searches, and offering them a sense of belonging,” she says. Heather believes that all women in the nuclear and radiation fields benefit from membership in Women in Nuclear – be they tradesperson, businesswoman, scientist or engineer.

Heather’s advice to women and young people is to “build bridges” and to give other women and young people a hand up whenever you can.

Kathy Lerette, Senior Vice President, Business Transformation, Alectra Utilities

Kathy Lerette is 35-year engineering and operations professional of the energy industry. Kathy currently serves as Senior Vice President, Business Transformation at Alectra Utilities – the second largest municipally-owned electric utility in North America created through the merger of Enersource, Horizon Utilities, PowerStream and Hydro One Brampton. As a Senior VP, Kathy ensures the successful delivery of any merger integration plans and business transformation - including continuous improvement of organizational effectiveness. She oversees supporting strategies that prioritize organizational efforts, initiatives, and resources that are critical in helping achieve the corporate mission, culture, values strategic objectives and future vision. Previously, Kathy served as VP Utility Operations for Horizon Utilities, where she oversaw all aspects of Engineering, Construction & Maintenance, and Supply Chain Management divisions. She provided leadership for the continuous improvement culture and initiatives that drove **increased levels of performance in Horizon Utilities’ operations.**



Kathy is also the Vice-Chair of the Electricity Human Resources Canada Board of Directors.



Elizabeth McDonald, President & CEO Canadian Energy Efficiency Alliance

Elizabeth McDonald has experience as a senior executive, industry advocate, industry advisor and board member with over 25 years experience in government relations, advocacy, organizational management, and communications with an accomplished record of service as a diplomatic intermediary between industry and government. In August of 2012, she accepted the position of President and CEO of the Canadian Energy Efficiency Alliance (CEEA), the national voice of energy efficiency and conservation in Canada. Since that time she has worked with the Board of CEEA on a strategic review of CEEA, developing new communication tools and **launching CEEA’s** first annual survey of Canadians on energy efficiency and conservation. Elizabeth is also on the Electricity Human Resources Canada Board of Directors.

Elizabeth brings over 20-years experience to the Alliance, having lead and managed several trade associations and most recently serving as a global advocate for sustainable clean energy solutions for the Canadian solar energy industry.

“Elizabeth’s recent experience as a global advocate for sustainable clean energy solutions fits in perfectly with CEEA’s mission—energy efficiency is part of every organization’s energy sustainability plan—it’s the cleanest form of energy

there is,” said Gary Johnson. “We’re excited to have her calibre of expertise on board to lead CEEA and further develop our membership, policies and advocacy efforts for energy efficiency in Canada.”

Prior to joining CEEA, Elizabeth served as a Senior Advisor, Business Development with SolPowered Energy Corporation (2011-2012), and previously as the Executive Director and President of the Canadian Solar Industries Association (CanSIA) (2007-2011). During this time, she worked closely with the Ontario government (Solar Task Force and FIT/Micro-FIT Advisory Committees), the Electricity Sector Council and the Ontario Sustainable Energy Association (OSEA). She was also named an Investment Canada Champion by the Department of Foreign Affairs and International Trade Canada (DFAIT) and travelled extensively throughout North America and overseas as a solar advocate and spokesperson.

Dawn Dalley, Vice-President, Regulatory Affairs and Corporate Services, Newfoundland and Labrador Hydro

Dawn Dalley was appointed Vice President, Regulatory Affairs and Corporate Services with Newfoundland and Labrador Hydro in August 2016. Since February of 2016 she held the position of VP Regulatory Affairs and Customer Services. Prior to that time, she held the role of Vice President, Corporate Relations at Nalcor Energy since 2011, moving from her role as Manager, Corporate Communications and Shareholder Relations. Dawn has a Bachelor of Public Relations and a Masters of Business Administration. In 2004, she received her accreditation from the International Association of Business Communicators and was the IABC NL Communicator of the Year in 2010. She is a volunteer Board Member with Ronald McDonald House Newfoundland and Labrador and the Manuels River Heritage Society. Dawn is also Chair of the International Women’s Forum NL sub-chapter.



Karen Hutt, President and Chief Executive Officer, Nova Scotia Power Inc.

Ms. Karen Hutt has been the President and Chief Executive Officer of Nova Scotia Power Incorporated since August 1, 2016. Ms. Hutt has more than 20 years of experience in senior roles in business development, marketing and strategy in competitive market environments. She served as Vice President of Mergers & Acquisitions at Emera Incorporated since July 19, 2016 until August 1, 2016. She served as an Executive Vice President of Commercial at Emera Energy Inc. since October 2014.

Since joining Emera in 2001, Ms. Hutt has held increasingly senior leadership positions with Emera. Recently, she played a critical role in the TECO Energy acquisition, helping to secure, advance and close the transaction. Ms. Hutt

served as President of Northeast Wind at Emera Energy Inc. from October 2012 to January 2015. Ms. Hutt was responsible for all commercial activities in Emera Energy including gas and power marketing and trading, origination, asset management and acquisitions. She joined the Emera group of companies at Nova Scotia Power in 2001 and has extensive experience across Emera. She served as Vice President of Commercial at Emera Energy Inc. since August 2010. She served as Vice President of Power and Director of Planning & Development at Emera Energy Services, Inc. from January 2009 to August 2010. Ms. Hutt was responsible for leading Emera Energy's strategic planning function.

Ms. Hutt's scope of responsibility also includes risk evaluation and commercial deal support at Emera. Ms. Hutt joined Emera Energy in 2006. Ms. Hutt served as Director of Corporate Planning and Strategy at Emera Inc. She was a Chair of the Junior Achievement of Nova Scotia Board of Directors and was a Board Member of the Nova Scotia Arthritis Society. She serves as a Director of Nova Scotia Power Incorporated since 2016. She is a Trustee on the IWK Foundation Board in Halifax. Ms. Hutt serves on the Board and Executive of Junior Achievement of Nova Scotia. She holds degrees from Acadia University and Mount Saint Vincent University.

Dawn L. Farrell, President & CEO TransAlta Corporation

Dawn Farrell was appointed President and Chief Executive Officer of TransAlta Corporation in January 2012. Dawn has 30 years of experience in the electric energy industry, having held a number of senior management positions at TransAlta and BC Hydro. Her business experience spans a variety of areas in finance, business development, strategic planning, commercial operations, energy marketing and sustainable development.



Prior to serving as TransAlta's President and Chief Executive Officer, Dawn served as the company's Chief Operations Officer from 2009 – 2011. During her tenure at TransAlta, she has also served as Executive Vice President, Commercial Operations and Development; Executive Vice President, Corporate Development; Executive Vice President, Independent Power Projects; and Vice President, Energy Marketing and IPP Development.

From 2003 to 2006, Dawn was Executive Vice President, Generation at BC Hydro. In 2006, she was appointed Executive Vice President Engineering, Aboriginal Relations and Generation.

Today, Dawn sits on the boards of The Chemours Company, The Conference Board of Canada, the Business Council of Canada and TransAlta Corporation. She is also a Community Champion for Momentum, a Calgary organization that partners with people living on low incomes and inspires the development of local economies. Her past directorships include the Calgary Stampede, Mount Royal College Board of Governors, Fording Coal Income Fund, New Relationship Trust Fund, Mount Royal College Foundation and Vision Quest Windelectric.

Dawn holds a Bachelor of Commerce degree with a major in Finance and a Master's degree in Economics from the University of Calgary (Calgary, AB). She has also attended the Advanced Management Program at Harvard University (Cambridge, MA).

From 2008-2009, Dawn served as Co-Chair of the Government of Canada’s Wind Technology Roadmap Industry Steering Committee. In 2012, she was appointed to the Alberta Energy Deputy Minister’s Electricity Advisory Group. She also serves on the Canadian Federal Government’s Advisory Council for Promoting Women on Boards headed by the Honourable Rona Ambrose.

Dawn has been an active supporter of the community. In 2013, she joined Calgary Police Chief Rick Hanson to serve as Co-Chair of Calgary’s 2013 United Way Campaign.

Jessica McDonald, President & CEO BC Hydro

As President and CEO of BC Hydro Jessica leads BC’s largest Crown corporation, a clean energy utility generating 98% renewable and clean electricity, transmitting and distributing to 4 million customers, with \$5.5 billion in annual revenues. BC Hydro is currently investing in an unprecedented capital program of refurbishment and expansion of its electricity assets, spending approximately \$2 billion over the next 20 years, including the development of the \$8.3 billion Site C hydropower project.



As part of a new focus on customer service and employee engagement, Jessica led a brand, vision and values refresh at BC Hydro resulting in the company being named #1 most influential brand in BC in 2016, with the company also being named Canada’s #1 employer in 2016.

Prior experience includes commercial mediation and negotiation on major infrastructure and industrial projects in BC, Deputy Minister in the BC government for 6 years as well as many other posts in the government under numerous administrations beginning in 1991. From 2005 to 2009 she held the most senior public service position in the provincial government as Deputy Minister to the Premier, Cabinet Secretary and Head of the BC Public Service, responsible for oversight of all aspects of government operations. During her term, she led landmark discussions including negotiation of the "New Relationship" between government and First Nations in British Columbia. As Head of the BC Public Service, Jessica initiated a bold human resources renewal program, achieving a 10-point increase in employee engagement with positive gains sustained over multiple years including economic downturn.



Teresa Conway, President & CEO Powerex

As CEO of Powerex, Ms. Conway reports to Powerex's Board of Directors. Ms. Conway leads a multi-disciplinary team in a complex and volatile market. As a member of BC Hydro's Executive Team, she is also responsible for developing and implementing strategic plans that complement BC Hydro's core business strategy and mission.

Teresa has held Board of Director Positions with Western Electricity Council (Board and Governance Committee), the Canadian Electricity Association, not for profit boards and has participated in provincial government, industry and community forums. She is a Board of Director for Vancity. She is a Chartered Accountant and has obtained the Institute of Corporate Directors professional designation of ICD.D.

Alison Thompson, CanGEA Chair & Co- Founder

Having held several positions at a coal based utility in the US and hydrocarbon giants in Canada such as Suncor and Nexen and now as a Principal at Borealis GeoPower, Alison Thompson has stood on both sides of what sometimes seems like a deep divide between renewable and non-renewable energy production. As an engineer, she brings a depth of understanding of the technology behind energy production. Through her incredible diversity of experience, she has developed an intimate understanding of the political landscape and business culture of energy in Canada and beyond.



Her board experience is equally as diverse as her career experience. Locally, she is a board member of Alberta Innovates as well as a Fellow of The Natural Step's Alberta Energy Futures Lab. Nationally, she is the Chair and a Founder of the Canadian Geothermal Energy Association as well as a director of Youth Science Canada. Globally, she is a director of the International Geothermal Association where she is part of a committee charged with crafting geothermal resource specifications for the United Nations. She also serves on the US based Geothermal Resources **Council's Public Outreach Committee and is an ongoing Expert Evaluator** for the European Commission's Research Executive Agency.

She was an Officer of Alterra Power (formerly Magma Energy), an evaluator for the Canada Foundation for Innovation and has served on the Board of Directors of Petroleum Technology Alliance Canada and Deep Earth Energy **Production. Internationally, she was a member of the Executive Committee of the International Energy Agency's Geothermal Implementing Agreement and has also served on the European Union's Enhanced Geothermal Innovative Network for Europe's Stakeholders Committee and was the Geothermal Energy Forum Chair at the 20th World**

Petroleum Congress in Qatar.

Recently, Ms. Thompson completed training for the Climate Reality Project, and is undertaking her third round of “10 Acts of Leadership”.

She has dedicated a substantial part of her career to demonstrating that Canada does not have to choose between the economy and the environment. Ms. Thompson is also the inaugural recipient of the Belle Mulligan Award for Leadership from the Canadian Investor Relations Institute as a result of her work and presentation skills that have promoted geothermal energy nationally and internationally. She routinely appears on national television and radio, and in magazines and newspapers.

She holds Bachelor and Master of Chemical Engineering degrees from McGill University, a Professional Engineering designation from APEGA, as well as a Master of Business Administration degree from Queen’s University.

Cara Clairman, President & CEO - **Plug’n Drive**

Cara is President and CEO of **Plug’n Drive**, a non-profit that is accelerating the adoption of electric vehicles (EVs) through education and infrastructure. I came up with the idea while working as the VP of Sustainable Development at [Ontario Power Generation](#) and pitched the idea to the OPG leadership – if we could find a way to encourage people to adopt electric cars and plug them in overnight, we could increase the use of surplus base load electricity, providing the Province with significant environmental and economic benefits. OPG was supportive and Plug’n Drive was born!



Additional insight on Representation of Women in the Sector:

<http://tsss.ca/2014/06/women-in-csr-canada-cara-clairman-president-and-ceo-of-plug-n-drive/>



Elisa Obermann, Executive Director – Marine Clean energy Canada

Elisa joined Marine Clean energy Canada in 2012 to support and strengthen collaboration in the Atlantic region. In her current role as an executive director, Elisa plays a key role in working with industry, the supply chain, research community, and government to advance marine renewable energy development.

Elisa brings a range of experience and expertise in the marine renewable energy sector, having also held roles at the Fundy Ocean Research Center for Energy (FORCE) and Nova Scotia Department of Energy. She also spent several years in the private sector, specialized in corporate communications and marketing.

Elisa holds a Bachelor of Arts in English and a Masters in Public Administration from Dalhousie University.

Additional profiles of women working in the renewable energy field can be found through WiRE at: <http://www.womeninrenewableenergy.ca/blog/>

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