

The role of women in the clean energy transition

The paper presents a new Technology Collaboration Program (TCP) on the role that women can play in the energy transition, named Clean Energy Education and Empowerment (C3E TCP). Launched by Canada, Sweden and Italy, the initiative is under the International Energy Agency (IEA) legal framework. The background, the rationale for creating an IEA TCP as well as the program of work will be described

DOI 10.12910/EAI2017-026

by **Alicia Mignone**, *Chair of the IEA Committee on Energy Research and Technology*

The Clean Energy Education and Empowerment (C3E) initiative was launched at the Clean Energy Ministerial (CEM) in 2010 [1]. The 24 countries and the European Commission, that are CEM members, account for about 90% of the global energy investments and 75% of the global greenhouse emissions. Current CEM members are Australia, Brazil, Canada, Chile, China, Denmark, the European Commission, Finland, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Norway, Russia, Saudi Arabia, South Africa, Spain, Sweden, the United Arab Emirates, the United Kingdom and the United States. Since 2016, the CEM Secretariat is hosted by the IEA in Paris.

Background

The C3E initiative was born out of recognition that the ideas and talents of all members of society are essential to meeting our future clean energy challenges. Women make up substantially less than half of the workforce in science, technology, engineering and math (STEM) fields and across the clean energy sector. Closing the gender gap and increasing women's participation and leadership in these fields are the goals of the C3E program that seeks to both inspire more women to enter into clean energy careers and retain the current female clean energy workforce. Without engaging women, countries are leaving half

of the potential energy workforce out of the talent pool, hampering the current and future STEM driven economy and economic growth (see box "World Economic Forum – The Global Gender Gap Report 2016"). The C3E initiative will formalize its activities using the IEA's TCP mechanism. The TCPs are independent, international groups of experts that enable governments and industries from around the world to lead programs and projects on a wide range of energy technologies and related issues [3]. C3E will be the second CEM initiative to take this approach; the first one was the International Smart Grid Action Network (ISGAN) that has been operating successfully since 2011.

World Economic Forum – The Global Gender Gap Report 2016

Women graduating from tertiary education courses have acquired a similar range of skills and academic subject knowledge to their male colleagues. However, one area in which women continue to remain under-represented is among STEM graduates, for which the global gender gap stands at

47%, with 30% of all male students graduating from STEM subjects, in contrast to 16% of all female students. That gap is commonly attributed to negative stereotypes and lack of role models, lowering girls' performance and aspirations vis-à-vis science and technology. It represents a key emerging issue for gender parity, since STEM careers are projected to be some of the most sought-after in the context of the Fourth Industrial Revolution. [2]

Advantages of the TCPs mechanism

Establishing the C3E as a TCP provides several distinct advantages. The TCP model of cooperation is a time-proven, flexible instrument that enables participants to work towards common goals:

- The scope may be adjusted to meet the ongoing needs and interest of all the participants (work is organized in different Tasks)
- Participants may choose to take part in different Tasks and activities in line with their respective priorities
- Governments, the private sector, international organizations, Non-Governmental organizations, academic institutions and other entities may participate.

Governed by a common set of rules:

- IEA framework for International Technology Cooperation

Supported by the IEA Secretariat:

- Providing advice and guidance
- Raising awareness of activities
- Facilitating cooperation with other TCPs.

One advantage in particular to establishing the C3E as a new TCP is the potential to significantly broaden outreach worldwide. In addition, the C3E TCP would be given greater visibility within IEA member countries through the 6000 experts participating in the IEA Energy Technology Network.

The TCP would build on existing programs, pulling together initiatives in IEA and CEM countries (and beyond when appropriate) to create an international platform to focus on issues related to gender in the clean energy sector.

Membership in the C3E TCP is voluntary and will be subjected to fulfillment of the criteria set out in the C3E legal text. At present, Canada, Sweden and Italy have adhered to the TCP C3E.

Scope and objectives

The aims of the C3E are to recognize and build a community of women leaders in the field of clean energy across diverse sectors; create a framework for cooperation and information sharing among participating countries and share best practic-



World Economic Forum – The Gender Global Gap Report 2014

Time passes slowly when change is overdue. The World Economic Forum in its Global Gender Gap Report 2014 estimates it will take until 2095 to achieve global gender parity in the workplace. Eighty more years until companies and governments are equally led by men and women. And 80 more years of talent pipelines and professional promise not fully realized.

es for effective strategies to advance women in the clean energy field. The objectives will include, but are not limited to:

- *Building workforce skills and knowledge:* C3E seeks to inspire more women to enter into clean energy careers, equip women for success in pursuit of these careers by preparing women for these opportunities, and evaluate barriers to career entry;
- *Creating leadership bridges and opportunities for women in clean energy:* In addition to the lack of women overall in the clean energy sector, the percentage of women in leadership positions is even smaller. Women are severely underrepresented on boards of energy companies, in senior level positions over en-

ergy and clean energy offices in governments, leading start-ups, and finance companies. A recent Ernst & Young survey [4] found that women made up only five per cent of board executives across the global power and utilities sector in 2015;

- *Increasing recognition and celebration of women in clean energy:* The lack of women in leadership positions in the clean energy sector compounds difficulty of recruitment and retention of female leaders. Research [5] shows that visible role models and success stories can help to reduce gender stereotypes and inspire younger generations to pursue STEM careers;
- *Establishing robust networks:* Operating independently, countries are lacking the full potential to

move the needle when it comes to gender equality in the clean energy workforce. Building a platform for international collaboration and dialogue, sharing expertise, and facilitating exchange on best practices, supporting policies, programming, and career development and knowledge exchange will be instrumental to the success of the goals of C3E. This includes leveraging C3Enet.org, a global website to connect women in clean energy.

Deliverables

For the first five-year term, the C3E TCP will deliver the following:

- Disseminating results, best practices, databases, and research.
- Developing a leadership program for mid-career women in clean energy and learning exchange program between C3E Participants.
- Hosting an International C3E Summit.
- Expanding the International C3E Ambassador Corps (Box 3) and establishing International C3E Awards.
- Leveraging C3Enet.org and C3E social media groups to enable women in clean energy to

Ambassador Corps

One way C3E works to shift the status quo is by naming accomplished, senior-level women as C3E Ambassadors to leverage their power as role models. CEM partner governments have been invited to name C3E Ambassadors from their countries to serve in the C3E International Ambassador Corps. Named Ambassadors to date are listed in the

CEM website [6]. The list of Ambassadors will expand as new members are nominated.

To date, 11 CEM governments have named a total of 61 C3E Ambassadors; more than 900 women have become members of C3Enet.org; and in the first five years of the U.S. C3E program, 37 mid-career women have been recognized with C3E Awards for their accomplishments and leadership in the sector, as well as 5 lifetime achievement honorees.



exchange information and find mentors, employers, employees, partners, funders, and other opportunities in the field.

Activities

The activities organized in Tasks will support the four elements of the C3E scope and the deliverables, both outlined previously. All Tasks areas are open to participation of Sponsors.

- *Global Women in Clean Energy Resources and Needs Inventory.* The objective of this Task Area is to collect information on women's participation in the clean energy sector workforce. To this end, it will include designing both short-term and long-term methodologies for providing consistent, usable data measuring clean energy sector job growth includ-

ing a breakdown of *gender participation levels and pay*, if available; analysis from the perspective of both employers and applicants on any barriers to hiring women in the clean energy sector; and analysis of existing strategies to eliminate or minimize these barriers .

- *Women in Clean Energy Career Development Network.* The objective of this Task Area is to support and enable learning opportunities for women in the clean energy sector to prepare them for leadership positions in the sector. It includes developing a leadership program for mid-career women in clean energy in economies that are Participants in the TCP. It also includes engaging *Ambassadors – senior level women in clean energy* – to serve as role models and mentors in clean energy career de-

velopment (see box “Ambassador Corps”).

- *Annual International C3E Recognition and Awards Program.* The objective of this Task Area is to increase visibility of mid-level women in clean energy and provide recognition, role models, and advocate for women in clean energy. Participants in this Task Area will create an annual recognition and award program, with the option of utilizing the model of the U.S. *C3E Awards*. The recognition and award program will set categories of work to recognize (i.e. advocacy, education, law & finance, research), and determine a procedure to solicit nominations, vet nominations, solicit prizes, announce winners, and celebrate the winners.
- *Global Women in Clean Energy Communications Hub.* The objective of this Task Area is to build a *platform for international collaboration and dialogue* to share expertise, facilitate an exchange of best practices and international policies that support women in clean energy. These efforts will work to increase the C3E initiative visibility within the IEA Energy Technology Network. The Communications Hub can also enable impactful programming and career development and knowledge exchange. Deliverables will include exchanging information among Participants and leveraging C3Enet.org and C3E social media groups to enable women in clean energy to exchange information and find mentors, employers, employees, partners, funders, and other opportunities in the field.

Final considerations

The IEA C3E TCP starts to present with three countries - Canada, Sweden and Italy – and aims to increase participation of partner countries as well as find sponsors interested in the role of women in the clean ener-

gy transition. It builds on the sound experience gained by the C3E initiative launched by the CEM and the US DOE program, and will benefit of the support of the IEA Secretariat. *The extraordinary and recognized capacity of women to handle complex and multivariable contexts and their*

openness to innovation will certainly be an asset to the success of the IEA C3E TCP.

*For further information,
please contact:
alicia.mignone@esteri.it and
alicia.mignone@gmail.com*

REFERENCES

[1] See in Youtube: Ernest Moniz | C3E Women in Clean Energy Symposium; Ernest Moniz, previous Secretary of the US Department of Energy explains the origin of the C3E, in “Perspectives from the 7th Clean Energy Ministerial”. 5th Annual C3E Women in Clean Energy Symposium; May 31, 2016, Stanford Precourt Institute of Energy University

[2] Hill, C., C. Corbett and A. St. Rose, *Why So Few? Women in Science, Technology, Engineering, and Mathematics*, American Association of University Women, 2010, <http://eric.ed.gov/?id=ED509653>

[3] IEA Technology Collaboration Programmes - Highlights and Outcomes, pp. 81-83. Free download at www.iea.org/publications/freepublications/publication/TechnologyCollaboration/Programmes.pdf

[4] Ernst & Young, *Women, fast forward*, 2015. Available at www.ey.com/womenfastforward

[5] See OECD Gender portal data at <http://www.oecd.org/gender>

[6] See list at <http://www.cleanenergyministerial.org/Portals/2/pdfs/C3E-International-Ambassador-Roster-Nov2016.pdf>