

TRACKING INCREASE IN WOMEN'S EMPLOYMENT IN THE RENEWABLE ENERGY SECTOR UNDER NDC TARGETS:

An Employment Assessment of Renewable
Energy Targets under the Nationally Determined
Contributions (NEAR-NDC) Project

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Tracking increase in women's employment in the renewable energy sector under NDC targets

In 2019-2020, the Global Green Growth Institute (GGGI) completed its Employment Assessment of Renewable Energy Targets under the Nationally Determined Contributions (NEAR-NDC) Project. The project aimed to generate an evidence base for the link between Renewable Energy (RE) targets in NDCs and its required investments with employment generation to support and strengthen GGGI Member countries' RE policy framework for NDC implementation and achievements of Sustainable Development Goals (SDGs). The study informs policymakers about the RE sectors with the greatest potential to generate employment. It provides a simulation model to assess employment effects by a unit of investment in different electricity generation sectors. As 140 NDCs mention RE technologies in their text, of which 105 include quantified RE targets,¹ it is clear that NDCs are vital instruments for guiding the **energy transition as a climate mitigation action, moving away from fossil fuel generation to RE technologies**.

Job creation is one of the most visible socio-economic co-benefits generated by climate mitigation actions, and one that both helps policymakers obtain traction with their constituencies and creates multiple social and economic benefits. Additionally, when deliberately applying a gender lens with an ambition to close the gender gap in the sector, equal opportunities for green jobs will increase women's economic empowerment through access to new and decent job opportunities.

NDCs were, however, less ambitious in recognizing gender equality and women's empowerment objectives in their text, when compared or assessed in conjunction with the RE mentions. An assessment conducted by the International Union for the Conservation of Nature (IUCN) in 2016 **showed that of the 162 NDCs presented, only 65 (or 40%) of them mention women or gender in their text.** The highest number of mentions are related to identifying gender as a cross-cutting policy priority to mainstream gender into climate change actions at the national level. Furthermore, **only three**

NDCs specifically mention gender in their mitigation sections.² This study shows that although developing countries recognize the importance of gender considerations³ in confronting climate change, including co-benefits, they may still require further support and better data collection to integrate these considerations into their national climate actions and investments. For the RE sector, this means moving beyond securing universal access to modern energy technologies, to ensure that women and men can benefit equally from the new labor opportunities and conditions related to the energy transition. The energy transition, therefore, provides a chance to reduce historical gender gaps and participation in the energy sector.

In exploring further linkages between job creation and co-benefits in the RE sector, **the NEAR-NDC project sought to understand how existing data on the labor composition of the sector could be used to project women's participation in the new labor force and the related potential benefits.** This discussion paper introduces a series of elements identified in the NEAR-NDC research process. It covers the current status of women's participation in the energy sector, the focus on assessing women's participation in two countries of analysis, Mexico and Rwanda, and lessons learned that could inform future labor projection models and the assessment of co-benefits.

¹ IRENA (2019a) NDCs in 2020: Advancing renewables in the power sector and beyond, International Renewable Energy Agency, Abu Dhabi. At: <https://www.irena.org/publications/2019/Dec/NDCs-in-2020>

² IUCN and USAID (2016) Gender in Mitigation Actions. EGI Brief. April 2016 Edition. Obtained at: https://portals.iucn.org/union/sites/union/files/doc/gender_in_mitigation_actions4.pdf

³ No references to women or gender were included in NDCs presented by developed countries.

1. Understanding women's participation in the energy sector and its implications for the energy transition

1.1. Energy transition and gender equality

Countries embarking on an **energy transition** to achieve decarbonization targets have the opportunity to shape interventions to shift to a more sustainable society, based on a green economy and the existence of decent jobs and livelihoods for all.⁴ The International Trade Union Confederation (ITUC) has defined this process as a **just transition**:⁵ one that brings social progress, environmental protection, and economic needs into a framework of democratic governance, **where labor and other human rights are respected and gender equality achieved**.⁶ A just transition in the energy sector maximizes benefits derived from the manufacturing, deployment, installation, and maintenance of RE technologies for women and men on equal terms.

Three job areas in the energy sector appear to have particularly strong potential for increased gender diversification: (i) engineers and technicians; (ii) construction, installation, and manufacturing jobs; and (iii) public and private-sector leadership.⁷ These areas are in line with ITUC's call to combat traditional occupational segregation of women –which relegates them to join low paid economic activities– through actions that will ensure their full and equal participation in the labor force. Such efforts include **encouraging**

women to join non-traditional sectors such as those linked to green jobs.⁸ The ITUC further calls for

vocational training, education, and skills development policies to promote equality of opportunity for girls and women. Moreover, it acknowledges the need to put initiatives in place that support the sharing of family responsibilities between women and men, as a means to achieve a better work-family life balance and encourage women's positioning in non-traditional economic sectors.⁹

The energy transition brings with it a **new demand for and shortage in high-skilled workers**.¹⁰ For example, a 2015 report on the wind industry in the U.S. projected that achieving the national wind energy targets would require growth in employment from 50,000 people to 230,000 by 2030, and 600,000 by 2050. Although the report does not provide data on skills gaps, it does acknowledge that the U.S. might need to invest in wind-related education and training in several areas, as available skilled technicians may not be sufficient to support the expansion of the sector. Measures highlighted by the report include developing 90 additional post-secondary professional certificate programs, 30 additional bachelor's degree programs, and 10 additional master's, Ph.D., and law degree programs.¹¹

The **NEAR-NDC project** also points to a shortage of high-skilled workers in the pilot countries researched. In the case of **Mexico**, the study estimates that the RE sector NDC targets for 2030 could generate as many

⁴ ITUC (n.d.) A Just Transition: A fair pathway to protect the climate. Brief. International Trade Union Confederation (ITUC) and Trade Unions and Climate Change (TUCC). Obtained at: <https://www.ituc-csi.org/IMG/pdf/01-Depliant-Transition5.pdf>

⁵ According to Rosenberg (2010), the "... "Just Transition" can be understood as the conceptual framework in which the labour movement captures the complexities of the transition towards a low-carbon and climate-resilient economy, highlighting public policy needs and aiming to maximize benefits and minimize hardships for workers and their communities in this transformation." Rosenberg, A. (2010) Building a Just Transition: The linkages between climate change and employment. Vol 2, Issue 2, International Journal of Labour Research. At: http://www.ilo.org/wcmsp5/groups/public/@ed_dialogue/@actrav/documents/publication/wcms_153352.pdf

⁶ ITUC (2010a). Resolution on Combating Climate Change Through Sustainable Development and Just Transition. 2CO/E/6.10 (final). 2nd World Congress. Vancouver, 21 - 25 June 2010. International Trade Union Confederation. Obtained from: https://www.ituc-csi.org/IMG/pdf/2CO_10_Sustainable_development_and_Climate_Change_03-10-2.pdf

⁷ Pearl-Martinez, R. and Stephens, J.C. (2016) Toward a Gender Diverse Workforce in the Renewable Energy Transition. Sustainability: Science, Practice and Policy, 12:1, 8-15. Obtained from: <https://www.tandfonline.com/doi/abs/10.1080/15487733.2016.11908149>

⁸ ITUC (2010b). Resolution on Gender Equality. 2CO/E/6.3 (final). 2nd World Congress. Vancouver, 21 - 25 June 2010. International Trade Union Confederation. Obtained from: https://www.ituc-csi.org/IMG/pdf/2CO_03_Gender_equality_03-10-2.pdf

⁹ ITUC (2010b). Resolution on Gender Equality. 2CO/E/6.3 (final). 2nd World Congress. Vancouver, 21 - 25 June 2010. International Trade Union Confederation. Obtained from: https://www.ituc-csi.org/IMG/pdf/2CO_03_Gender_equality_03-10-2.pdf

¹⁰ IRENA (2013) Renewable Energy and Jobs. International Renewable Energy Agency. Abu Dhabi, United Arab Emirates. Obtained at: [https://www.irena.org/publications/2013/Dec/Renewable-Energy-and-Jobs-\(2013\)](https://www.irena.org/publications/2013/Dec/Renewable-Energy-and-Jobs-(2013))

¹¹ US DOE (2015) Wind Vision: A new era for wind power in the United States. U.S. Department of Energy. Obtained from: https://www.energy.gov/sites/prod/files/WindVision_Report_final.pdf

as 833,000 jobs. The analysis shows that there is a sufficient supply of professionals to cover the demand for management, finance, and legal services positions. However, the study found that engineers may need to undergo further certification and training processes to specialize in RE technologies and that there could be a gap between the available number of graduates and enrolled students and the expected future demand for technicians.¹²

In the case of **Rwanda**, the study estimates that the RE sector could generate about 28,000 jobs. The availability of skilled professionals in the country is currently insufficient, with project developers relying on foreign specialists to meet their labor requirements. The skills gap also exists in certain low skill occupations, where construction and installation (C&I) and operation and maintenance (O&M) positions require foreign labor.¹³ The existing skills gap in Rwanda calls for more immediate investment in vocational training and programs designed to equip young women and men in the country to join the energy transition.

In **acknowledging the gender dimension of the RE sub-sector, policymakers can guide the energy transition process to ensure that women can join this new and expanding labor force on equal terms to their male counterparts.** Expected skill shortages in the industry could be addressed by removing existing barriers and working towards equal employment opportunities for women in the sector, thereby increasing the talent pool available.¹⁴ Moreover, a well-designed energy transition can maximize other socio-economic benefits by increasing access to affordable and reliable energy for households and micro or small-enterprises, where women are primary actors.

In the spirit of a just transition, the RE sub-sector would need to ensure **decent jobs** for the women and men working in it. According to the International Labour Organization (ILO), this **means having access to fair income, having security in the workplace and social protection for families, and better prospects for personal development, while ensuring equal opportunities and treatment for women and men.**¹⁵ Only in this manner will the commitments under SDG 8,

on decent work and economic growth, be in alignment with the gender equality goal under SDG 5, a cross-cutting goal, while achieving RE targets (SDG 7) and ensuring climate action (SDG 13). This discussion paper introduces several examples of the numerous actors implementing transformative solutions to encourage women's participation in the RE sector.

The NDC design incorporates a five-year review process, under which countries are encouraged to increase their climate ambitions. The Paris Rulebook calls on governments to ensure that planning and implementation processes include gender-responsive public participation and engagement with local communities and indigenous peoples,¹⁶ an element necessary for establishing an enabling environment for incorporating gender considerations in energy policies. **Policymakers can take advantage of the NDC five-year review cycle to assess existing RE policies and targets, and analyze how women and men are joining the RE sector as a means to increase participation further, address skill gaps, and improve labor conditions.** This process requires moving beyond quantifying women's participation in the sector, to ensure that sectoral consultations and assessments include their active involvement, to determine if they are enjoying the same benefits and opportunities as their counterparts.

1.2. Women's participation in the labor force and the renewable energy sector

International research shows that increasing women's participation in the global labor force is beneficial to economic growth. If their participation was similar to that of their male counterparts, **women could contribute an estimated US\$12 trillion to US\$28 trillion to the global annual GDP.**¹⁷ However, women

¹² GGGI (2020) Employment assessment of renewable energy: Power sector pathways compatible with NDCs and national energy plans. NEAR-NDC project. GGGI. Obtained at: https://ggi.org/site/assets/uploads/2020/06/Employment-Assessment-of-Renewable-Energy_Doublespread_final.pdf

¹³ GGGI (2020) Employment assessment of renewable energy: Power sector pathways compatible with NDCs and national energy plans. NEAR-NDC project. GGGI. Obtained at: https://ggi.org/site/assets/uploads/2020/06/Employment-Assessment-of-Renewable-Energy_Doublespread_final.pdf

¹⁴ IRENA (2013) Renewable Energy and Jobs. International Renewable Energy Agency. Abu Dhabi, United Arab Emirates. Obtained at: [https://www.irena.org/publications/2013/Dec/Renewable-Energy-and-Jobs-\(2013\)](https://www.irena.org/publications/2013/Dec/Renewable-Energy-and-Jobs-(2013))

¹⁵ ILO (n.d.) Decent work. Introduction in ILO main website. At: <https://www.ilo.org/global/topics/decent-work/lang-en/index.htm>

¹⁶ UNFCCC (2018) Further guidance in relation to the mitigation section of decision 1/CP.21 Annex 1. Information to facilitate clarity, transparency and understanding of nationally determined contributions, referred to in decision 1/CP.21, paragraph 28. Decision FCCC/CP/2018/L22. At: https://unfccc.int/sites/default/files/resource/122_0.pdf

¹⁷ Woetzel, J. et al (2015). The power of parity: How advancing women's equality can add \$12 trillion to global growth. McKinsey Global Institute. At: https://www.mckinsey.com/~/media/mckinsey/featured%20insights/Employment%20and%20Growth/How%20advancing%20womens%20equality%20can%20add%2012%20trillion%20to%20global%20growth/MGI%20Power%20of%20parity_Executive%20summary_September%202015.ashx

remain under-represented in the global workforce,¹⁸ which is detrimental both to their access to new job opportunities and to their potential overall contribution to economic growth.

Studies reaffirm that **gender diversity at high decision-making levels correlates with better performance indicators**, such as returns on investment and equity.¹⁹ **Utilities with better representation of women on their boards outperform those with a less diverse composition.**²⁰ Additionally, studies suggest that companies with more women on their board of directors are more likely to proactively improve the company's energy efficiency and increase investments in RE generation.²¹ Empirical research in developed countries also shows a trend in the increasing leadership of women in not-for-profit organizations aiming at advancing the energy transition. They play a critical role in integrating energy justice and energy democracy ideals with economic and racial justice, women's rights, and gender diversity concerns.²²

Despite the benefits of **women's participation in the energy sector** outlined here, their participation in the labor force **remains low**. The World Economic Forum (WEF), for example, estimated in its 2015 gender report that women make up only 19% of the energy labor force, representing 32% of board memberships, 11% of senior roles, 19% of mid-level positions, 24% of junior roles, and 19% of line positions.²³ Based on its Future of Jobs Survey data, WEF projects an increase in women's participation in the energy sector, estimating that by 2020 women will make up 20% of senior positions, 27% of mid and junior level roles, and 25% of line positions.²⁴

Other global studies, such as the one conducted for the **oil and gas sector** in 2017, **estimate women's participation at 22%**, made up of 27% of entry-level positions that require a college degree, 25% of mid-career level jobs, and 17% in senior and executive roles.²⁵

Efforts to address the data gap in the RE sector have been undertaken by the International Renewable Energy Agency (IRENA), which has estimated that **women's participation in the RE sector ranges between 32%²⁶ and 35%²⁷** of the workforce. The 2019 gender report estimates that women hold 46% of administrative positions and 32% of senior management roles.²⁸ Furthermore, IRENA's 2019 jobs report estimates that in the RE sector, women represent 28% of the science, technology engineering, and mathematics (STEM) related staff and 35% of non-STEM positions.²⁹

Estimates of women's participation in the RE sector need to be further refined **as percentages may vary within sub-sectors, and may also fluctuate between countries and regions, and change over time**. For example, a 2014 report by The Solar Foundation estimated that women accounted for 37,500 workers or 21.6% of the solar labor force in the U.S. at the time.³⁰ Women's participation in the solar industry in the U.S. seems to be on the rise, both in terms of absolute numbers and percentages. The 2018 report by the same foundation reported 63,806 women were working in the sector, accounting for 26.3% of the workforce, occupying 35.9% of positions in trade and distribution, and representing 24.5% of the workforce in the installation and project development sector, 25.5% in operations and maintenance, 28.3% in manufacturing, and 33.6% in the

¹⁸ According to the World Economic Forum (WEF), 55% of women are engaged in the labor force compared to 78% of men and at this pace it will take 257 years to close the gender gap in terms of economic participation. WEF (2019) Global Gender Gap Report 2020. Insight Report. Geneva, Switzerland. Obtained from: http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

¹⁹ Carter, N.M. & Wagner, H.M. (2011). The bottom line: Corporate performance and women's representation on boards (2004-2008). Catalyst. At: <https://www.catalyst.org/research/the-bottom-line-corporate-performance-and-womens-representation-on-boards-2004-2008/>

²⁰ EY. (2016). Women in power and utility index 2015. At: <https://www.ey.com/Publication/vwLUAssets/EY-women-in-power-and-utilities-index-2015/%24FILE/EY-women-in-power-and-utilities-index-2015.pdf>

²¹ McElhaney, Kellie A. & Mobasser, Sanaz. (2012). Women Create a Sustainable Future. UC Berkeley Haas School of Business. Obtained at: https://www.eticanews.it/wp-content/uploads/2012/11/Report-Women_Create_Sustainable_Value.pdf

²² Allen, A., Lyons, H. and Stephens, J.C. (2019). Women's leadership in renewable energy transformation, energy justice and energy democracy: Redistributing Power. Energy Research and Social Science. Vol. 57, November 2019. Obtained at: <https://www.sciencedirect.com/science/article/pii/S2214629619300829>

²³ World Economic Forum. (2016). *The industry gender gap*. Women and Work in the Fourth Industrial Revolution, Chart on Gender wage gap and women's participation by industry. At: http://www3.weforum.org/docs/WEF_FOJ_Executive_Summary_GenderGap.pdf

²⁴ World Economic Forum. (2016). *The industry gender gap*. Women and Work in the Fourth Industrial Revolution, Chart on Gender wage gap and women's participation by industry. At: http://www3.weforum.org/docs/WEF_FOJ_Executive_Summary_GenderGap.pdf

²⁵ The report is based on a survey to 38 companies and about 2000 women and men working in the oil and gas sector. Rick, K., I. Martén, and U. Von Lonski (2017). Untapped Reserves: Promoting Gender Balance in Oil and Gas, World Petroleum Council and The Boston Consulting Group. At: <https://www.bcg.com/publications/2017/energy-environment-people-organization-untapped-reserves.aspx>

²⁶ IRENA (2019b). Renewable Energy: A Gender Perspective. International Renewable Energy Agency. Abu Dhabi. At: <https://www.irena.org/publications/2019/Jun/Renewable-Energy-A-Gender-Perspective>

²⁷ IRENA (2016) Renewable Energy and Jobs: Annual review 2016. International Renewable Energy Agency. Abu Dhabi. At: <https://www.irena.org/publications/2016/May/Renewable-Energy-and-Jobs--Annual-Review-2016>

²⁸ IRENA (2019b). Renewable Energy: A Gender Perspective. International Renewable Energy Agency. Abu Dhabi. At: <https://www.irena.org/publications/2019/Jun/Renewable-Energy-A-Gender-Perspective>

²⁹ IRENA (2019c) Renewable Energy and Jobs: Annual Review 2019. International Renewable Energy Agency. Abu Dhabi. Obtained at: <https://www.irena.org/publications/2019/Jun/Renewable-Energy-and-Jobs-Annual-Review-2019>

³⁰ The Solar Foundation (2014). National Solar Jobs Census. The Solar Foundation. Factsheet. January 15, 2015. Obtained at: <https://www.slideshare.net/TSF-Energy/factsheet-national-solar-jobs-census-2014>

“other” category.³¹ The 2018 report also mentions that percentage-wise, 2016 saw the most significant number of women in the solar workforce, with women making up 28% of the workforce in that year. The year 2016 was also the best year for national job growth, with a 25% increase in employment nationwide.³²

Furthermore, **data on women’s participation in the sub-sector is required to understand whether women’s participation continues to be concentrated in supportive roles.** For example, a 2016 report by the European Institute for Gender Equality (EIGE) estimates that women make up, on average, 22.1% of the energy sector in the European Union and slightly less than 30% of the manufacturing and generation related positions in the RE sub-sector. The report further states that women are generally employed in low-skilled administration and communications positions, with much less representation in high-skilled and better-paid jobs related to engineering or financial services.³³

Meanwhile, IRENA’s 2020 report on **women’s participation in the wind industry estimates their participation at 21% of the labor force** in that sub-sector, which is lower than even the global average of women in the oil and gas industry at 22%. When disaggregating the data by labor categories, women are estimated to account for 35% of administrative positions, 20% of non-STEM, and 14% of STEM positions. Women account for 13% of management and 8% of senior management positions in the wind industry.³⁴ The report further presents data showing that women participate in higher in numbers in Europe and North America (ENA)³⁵ and Latin America and the Caribbean (LAC) regions, at 26% and 19% participation rates, respectively. When participation is disaggregated at the level of positions and qualifications, data reveals that women’s participation is focused in administrative areas in the ENA and LAC regions, with women occupying 52% and 41% of posts, respectively.³⁶ **High participation rates in administration, not in STEM positions (which is 14% in ENA and 18% in LAC),³⁷ seem to be the main reason for the increase in women’s participation in the wind industry in these regions.**

The 2020 IRENA report further prompts a reflection on their 2018 estimate of the global average for women’s participation. **The 32% estimate of women’s participation included both information from women working in the “modern” RE sector and off-grid energy spaces.** Taking into account the effort made in increasing women’s role in energy access and the impact of energy services in women’s productive and economic activities,³⁸ high participation in the off-grid sector may have boosted the global participation average estimate. If so, this could mean that RE technologies where energy access does not play a major role –like wind– may employ fewer women than sub-sectors that do encompass off-grid solutions –such as solar or biomass-based technologies. Hence, further data disaggregation by sub-sector and RE technology may be required to fully understand whether women’s participation in off-grid energy spaces does significantly skew the global average of women participating in RE.

1.3. Factors influencing women’s participation in the renewable energy sector

Women are under-represented in the energy sector as a result of a combination of factors. Factors range from existing gender norms that tend to discourage their participation in **science, technology, engineering, or mathematics (STEM)** to the existence of recruiting practices that may inadvertently discriminate against women and working environments which do not enable an adequate work-life balance.

Studies confirm that there is no innate difference in the way girls and boys relate to STEM fields.³⁹

³¹ The Solar Foundation (2018) National Solar Jobs Census 2018, The Solar Foundation, Obtained at: https://www.thesolarfoundation.org/national/?mc_cid=eaf6332238&mc_eid=%5BUNIQID%5D

³² The Solar Foundation (2018) National Solar Jobs Census 2018, The Solar Foundation, Obtained at: https://www.thesolarfoundation.org/national/?mc_cid=eaf6332238&mc_eid=%5BUNIQID%5D

³³ EIGE (2016). Gender and Energy. European Institute for Gender Equality. Vilnius, Lithuania. Obtained at: <https://eige.europa.eu/publications/gender-and-energy>

³⁴ IRENA (2020). Wind Energy: A Gender Perspective. . IRENA, Abu Dhabi. Obtained at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jan/IRENA_Wind_gender_2020.pdf

³⁵ As per the report category, the North America region does not include Mexico, which is included in the Latin American and Caribbean region.

³⁶ IRENA (2020). Wind Energy: A Gender Perspective. . IRENA, Abu Dhabi. Obtained at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jan/IRENA_Wind_gender_2020.pdf

³⁷ IRENA (2020). Wind Energy: A Gender Perspective. . IRENA, Abu Dhabi. Obtained at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jan/IRENA_Wind_gender_2020.pdf

³⁸ IRENA (2020). Wind Energy: A Gender Perspective. . IRENA, Abu Dhabi. Obtained at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jan/IRENA_Wind_gender_2020.pdf

³⁹ Kersey, A. et al (2018). No Intrinsic Gender Differences in Children’s Earliest Numerical Abilities. npj Science Learn 3, 12 (2018). Obtained at: <https://www.nature.com/articles/s41539-018-0028-7#citeas> and Stoet, G., & Geary, D. C. (2018). The gender-equality paradox in science, technology, engineering, and mathematics education. Psychological Science, 29, 581–593. Obtained at: <https://journals.sagepub.com/doi/10.1177/0956797617741719>

However, **social stereotyping** is so strong that girls feel discouraged from joining STEM fields in early school years,⁴⁰ a phenomenon that may explain why women represent only 35% of STEM students in higher education globally⁴¹ and why they only account for 15% of engineers worldwide.⁴² In the case of Europe, for example, women between the ages of 22-29 years old made up 11% of STEM graduates in the region, compared to 22% for men in the similar age category.⁴³ Although not all positions in the energy sector are STEM-related, having a technical background is essential for joining high-skilled or technical positions, which are better remunerated than jobs in supporting or administrative roles. As women do not traditionally consider many of the jobs in the energy sector, educators, advocates, and workforce professionals must ensure that women are aware of these opportunities and receive support in seeking training, education (specifically STEM education), and employment.

As there are relatively fewer female candidates for entry point positions in the energy sector and the RE sector in particular, it is essential to **design recruitment processes that encourage women to apply**. Human resources departments should review job descriptions to ensure they do not deter women from qualifying and applying.⁴⁴ Posting job applications based on abilities –such as assessment of spatial awareness, assembly skills, and capacity to follow mechanical procedures— can broaden the set of candidates and overcome some of the social prejudices that may exist towards women engaging in technical work.⁴⁵ Additionally, companies may need to review their preferred recruitment systems, which rely heavily on the identification of candidates

through referrals or word of mouth.⁴⁶ Such methods fail to reach a diverse pool of candidates as people tend to refer those who are perceived to be similar to them.⁴⁷ In a sector with a high male participation rate, relying on these methods may unintentionally exclude qualified women from the pool of candidates.

Systematic unconscious biases and explicit discrimination in hiring for positions traditionally perceived as being masculine must also be addressed in the RE sub-sector.⁴⁸ **Affirmative employment hiring practices** supported by robust human resources policies can help to ensure that women receive a fair opportunity at joining and advancing in their careers in the sector.

Studies show that once women join the energy sector, **retention rates are low** as a result of the discrimination they experience in the workplace, which reduces their career opportunities. Moreover, labor conditions and work environments in the energy sector –which emphasize long working hours or require regular field missions-- are not conducive to work, life and family balance. For example, a study among 1200 women working in the energy sector revealed that **55% of the respondents had the intention of moving to other sectors in the short term**. Interestingly, **the rate was 15% higher for women with children**.⁴⁹

These factors have been identified as barriers to women retaining their work in the energy sector, including in developed countries.⁵⁰ Empirical evidence suggests that although the RE sector is less traditional in its composition than the fossil fuel sub-sectors, women still report facing similar difficulties to those reported in

⁴⁰ Modi, K., Schoenberg, J., & Salmond, K. (2012). Generation STEM: What girls say about science, technology, engineering, and math. Produced for Girl Scout Research Institute. At: https://www.girlscouts.org/join/educators/generation_stem_full_report.pdf Lindberg, S.M, et al. (2010) New Trends in Gender and Mathematics Performance: A meta-analysis. Psychological Bulletin. November 2010. 136 (6): 1123-1135. Obtained at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3057475/>

⁴¹ UNESCO (2017). Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM.)At: <https://unesdoc.unesco.org/ark:/48223/pf0000253479>

⁴² WEF (2019) Global Gender Gap Report 2020. Insight Report. Geneva, Switzerland. Obtained from: http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

⁴³ EIGE (2016). Gender and Energy. European Institute for Gender Equality. Vilnius, Lithuania. Obtained at: <https://eige.europa.eu/publications/gender-and-energy>

⁴⁴ Engility Corporation (2016) Engendering Utilities: Improving gender diversity in power sector utilities. Developed for USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment. Washington, DC. January 2016 Obtained from: https://unfccc.int/files/gender_and_climate_change/application/pdf/engendering_utilities.pdf

⁴⁵ IUCN and USAID (2018b). Advancing Gender in the Environment: Making the Case for Women in the Energy Sector. AGENT Thematic Energy Brief Series. March, 2018. Obtained from: https://www.usaid.gov/sites/default/files/documents/1865/IUCN-USAID-Making_case_women_energy_sector.pdf

⁴⁶ For example, a study in the solar sector in the US shows that companies have the same affinity for advertising new positions via on-line platforms (41%) and using employee referrals (41%) for filling new positions. These methods were followed in preference by recruitment of candidates word of mouth (32%) and referrals from non-employees (27%). The Solar Foundation (2019) U.S. Solar Industry Diversity Study 2019, The Solar Foundation and Solar Energy Industries Association. Obtained at: <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Industry-Diversity-Study-2019-2.pdf>

⁴⁷ Turnbull, H (2014). The Affinity Bias Conundrum: The Illusion of Inclusion Part III. Diversity Journal, May 20, 2014. Obtained at: <http://www.diversityjournal.com/13763-affinity-bias-conundrum-illusion-inclusion-part-iii/>

⁴⁸ Prebble, M and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan African energy utilities. An IUCN EGI brief. IUCN, Power Africa and USAID. Washington D.C., U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

⁴⁹ NES Global Talent and Energy Jobline (2018). Women in Energy Global Study. Obtained at: <https://www.theogtc.com/media/2411/woman-in-energy-global-study.pdf>

⁵⁰ European Institute for Gender Equality (EIGE). (2012) *Review of the Implementation in the EU of area K of the Beijing Platform for Action: Women and the Environment Gender Equality and Climate Change*. Report. European Union. At: <http://eige.europa.eu/sites/default/files/documents/Gender-Equality-and-Climate-Change-Report.pdf>

other energy sub-sectors.⁵¹ This evidence shows that RE companies should **review their corporate culture, to create spaces where women want to work.**⁵²



⁵¹ IRENA (2019c) Renewable Energy and Jobs: Annual Review 2019. International Renewable Energy Agency. Abu Dhabi. Obtained at: <https://www.irena.org/publications/2019/Jun/Renewable-Energy-and-Jobs-Annual-Review-2019>

⁵² Personal communication, Kristen Graf, Executive Director, Women of Renewable Industries and Sustainable Energy (WRISE). January 24th, 2020.

2. Tracking women's participation in the renewable energy sector

2.1. Rationale for tracking women's participation in the sector

Governments worldwide have committed to various international agreements that recognize women's rights and strive towards the achievement of gender equality and women's empowerment. Examples include actions under the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW), the Beijing Platform for Action, and the cross-cutting nature of SDG 5. **Gender equality** is also a guiding principle for the implementation of the Paris Agreement and in the UNFCCC's Lima Work Programme on Gender and its Revised Gender Action Plan.⁵³ Furthermore, increasing women's participation in the workforce has been proven essential to increasing development gains and should be an obvious priority for developing and developed countries.

Despite the above, recent reports consistently show that we are far from reaching equality worldwide. For example, the WEF estimates that we will need 257 years to achieve **economic equality**.⁵⁴ The UNDP's 2019 Human Development Report found that gender biases have grown in recent years in half of the 77 countries included in the study. For example, 50% of respondents think that men make better political leaders than women, and 40% of respondents believe that men make better business executives.⁵⁵

Sex-disaggregated data is essential for policymakers to develop efficient and effective evidence-based policies, strategies, and programs capable of reducing, or even eliminating, gender gaps that hinder the inclusion of women in economic activities.⁵⁶ Hence, there is a need to address data collection gaps and conduct analysis on

women's participation in the RE sub-sector, to identify practical measures to put in place to ensure that women benefit from the energy transition.

A participation baseline is necessary to understand the existence of any modification in women's engagement in the RE sub-sector, which requires access to reliable sex-disaggregated information.

Such a baseline is needed to monitor and evaluate countries' progress towards gender equality in terms of economic participation and decision-making processes, as a result of actions taken to comply with international commitments or national gender equality and energy policies.⁵⁷

Tracking women's participation in the RE sector is essential to understand the reasons behind their low enrollment and retention rates. Data on **women's participation in the labor force**, whether in the RE sub-sector or elsewhere, needs to be supplemented with information on labor conditions, such as equal treatment and payment, or access to social securities and benefits, to measure if those positions can be qualified as decent jobs. Hence, data needs to be both quantitative in terms of participation in the RE sub-sector and qualitative in terms of primary data related to gender norms and work environment. The latter will support recommendations for corrective measures and policies for addressing gender gaps in terms of inequalities in recruitment, payment, promotions, amongst other factors.

Sex-disaggregated data on employment is also required to identify the existence of prevalent and accepted practices for recruiting certain types of employees justified as being a "cultural fit" for the job, which can inadvertently discriminate against women.⁵⁸ This type of information is essential to assess the conditions under which women work and to understand whether they are on a par with those experienced by their male counterparts. **Lack of sex-disaggregated data makes it difficult to identify gender gaps in the labor force,**

⁵³ UNFCCC (2019) Gender and Climate Change. Enhanced Lima work programme on gender and its gender action plan. Decision FCCC/CP/2019/L.3 At: https://unfccc.int/sites/default/files/resource/cp2019_L03E.pdf

⁵⁴ WEF (2019) Global Gender Gap Report 2020. Insight Report. Geneva, Switzerland. Obtained from: http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

⁵⁵ UNDP (2019). Human Development Report 2019 Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century. UNDP, New York, U.S. Obtained from: <http://hdr.undp.org/sites/default/files/hdr2019.pdf>

⁵⁶ UNEP and IUCN. (2018). Gender and environment statistics: Unlocking information for action and measuring the SDGs. UN Environment, Nairobi, Kenya. Obtained at: <https://www.unenvironment.org/resources/report/gender-and-environment-statistics-unlocking-information-action-and-measuring-sdgs>

⁵⁷ Prebble, M. and Rojas, A (2017). Energizing Equality: The important of integrating gender equality principles in national energy policies and frameworks. IUCN and ENERGIA. Washington, D.C. USA. Obtained from: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-energizing-equality-web.pdf>

⁵⁸ Pearl-Martinez, R. and Stephens, J.C. (2016) Toward a Gender Diverse Workforce in the Renewable Energy Transition. Sustainability: Science, Practice and Policy, 12:1, 8-15. Obtained from: <https://www.tandfonline.com/doi/abs/10.1080/15487733.2016.11908149>

constraining the design and implementation of corrective measures aimed at improving conditions for women and men in all economic sectors, including RE.

Furthermore, **when engaged in modeling exercises and preparing for future labor markets, it is necessary to rely on sex-disaggregated data beyond the sector.**

Understanding the pipeline of future technicians and professionals and the related trends in student demographics requires information on the girls' and boys' preferences and their inclination to join STEM-related careers and the RE sector. A balance between sectoral needs and economic opportunities for women and men in a specific country or region is necessary for assessing the future availability of qualified individuals who can potentially enter the RE sub-sector or be retrained to do so.

2.2. Challenges in collecting sex-disaggregated data on the labor composition of the renewable energy sector

Accessing information on women's participation in the RE sector is challenging. Firstly, international efforts have only recently started on looking for existing sex-disaggregated labor participation data in the RE sector. The findings from these initiatives reinforce the claim that such information is not readily available or centralized at the national level. The reasons for this **lack of readily-available information** include the need for national entities to understand the value of capturing sex-disaggregated data and the limitations of existing data collection tools. The following subsections discuss some of the challenges encountered in sex-disaggregated data collection for the RE sub-sector.

2.2.1. Lack of fit-for-purpose data collection tools in national statistics offices

Countries with strong statistics offices may be **collecting relevant sex-disaggregated data through their periodic socio-economic surveys such as household or employment surveys.** These tools are generally based on international guidelines on industrial classifications of economic activities and occupations. For example, **ILO's classification of occupations**⁵⁹ presents a detailed list of jobs that can be used to identify the different positions existing in the RE sub-sector.⁶⁰ In principle, this means that it is possible to collect sex-disaggregated information for these occupations through the socio-economic surveys if databases are built to ensure that sex-disaggregated data is registered. However, to know how many of those positions exist in a specific sector, it is necessary to combine the occupation information with the existing industrial classification.

The **UN's Statistics Division develops the global classification of industrial activities.** Its definition of the electric power generation, transmission, and distribution sector bundles the operation of generation facilities that produce electrical energy using thermal, nuclear, hydroelectric, gas turbine, diesel, and renewable sources into one unique code (code 3510).^{61,62} As most countries use the International Standard Industrial Classification of All Economic Activities (ISIC) as their national economic activity classification, **it is likely that national statistics offices do not disaggregate the energy sector by generation technology.** Although the cross-referencing of data with ILO's occupation classification provides data on women's and men participation in the energy sector, clustering all generation sources together at the national level makes **this information insufficient to identify the number of women and men working in RE generation.**

With countries having data to report on the overall participation of women and men in diverse industrial sectors, national statistics offices may not see a need to invest time and resources to disaggregate data collection related to the RE sub-sector. There may also be a lack of international incentives to refine these data collection processes further. For example, the **Minimum Set of Gender Indicators** –considered the leading international list of gender indicators required for addressing many of the critical areas of concern in

⁵⁹ ILO (2012). International Standard Classification of Occupations: ISCO -08 / International Labour Organization. Geneva. ILO. Obtained at: https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/dcomm/-/publ/documents/publication/wcms_172572.pdf

⁶⁰ The ILO's classification allows for different types of positions to be identified, ranging from technicians –such as electricians– and manufacturers, to different categories of engineers, as well as financial, administrative and legal positions.

⁶¹ UN Statistics Division (2008). International Standard Industrial Classification of All Economic Activities Revision 4. Statistical Papers. Series M. No.4/Rev.4 ST/ESA/STAT/SER.M/4/Rev.4. Statistics Division. Department of Economic and Social Affairs. UN. New York. Obtained at: https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf

⁶² ISIC further identifies other classifications that may be relevant to tracking participation in the renewable energy sector, such as energy generated by incineration of non-hazardous waste (code 3821), non-electrical solar energy collectors (code 4322), or manufacturers of energy wires (code 2733).

the Beijing Platform for Action—⁶³ requires countries to report on the percentage distribution of the employed population in a sex-disaggregated manner by sectors aggregated under three main categories: agriculture, industry, and services.⁶⁴ Therefore, to comply with the reporting under the Beijing Platform for Action, countries need to cluster, not disaggregate, the ISIC classifications, with energy activities falling under the industrial sector category.

Furthermore, the **Global SDG Indicators** do not require countries to report on the proportion of labor in the RE sub-sector as part of their commitments to advancing SDG 7, 8, or 13, even though gender equality (SDG 5) is a cross-cutting goal.⁶⁵ The Global SDG Indicators align with the data collection and management processes already in place for the countries and the data custodian agencies –such as ILO. Hence, seeking to avoid imposing an unnecessary burden on national statistical systems, national government agencies, and other partners.⁶⁶

Therefore, to identify the labor composition of the RE sector, national statistics offices would have to **modify socio-economic surveys to disaggregate renewable sub-energy technologies in the energy sector**.

Such a survey expansion entails increased human and financial resources to collect and process additional data. Statistics offices would need a strong motivation to expand already long surveys to identify a relatively small number of persons working in a non-traditional sector.⁶⁷ Between the need for additional resources and an international framework that does not call for the sex-disaggregation of data in the RE sector, statistics departments have little to no incentive to modify their existing tools to disaggregate specific industrial sub-sectors or economic activities further.

2.2.2. National mandates to collect sex-disaggregated data on women's participation in the renewable energy sub-sector

As discussed in section 2.2.1, international commitments related to gender equality do not necessarily require countries to report on women's economic participation

disaggregated by economic sub-sectors. In some countries, the need to track women's participation in the energy transition can stem from a different **mandate**: that **created by national legislation**. A 2017 IUCN assessment of 194 energy frameworks revealed that **19 frameworks directly mention the need for addressing women's participation in the energy sector**. Most striking perhaps is the fact that of the frameworks assessed from developed countries, only three (Canada, Spain, and the U.S.) mention gender, with all of those mentions related to increasing women's participation in the sector.⁶⁸ The recognition of women's participation in the RE sector is also found in the climate change conversations in developed countries, where discussions on energy transition interlinkages focus on women's and men's perceptions of climate change and the gaps in their participation in the energy sector.⁶⁹

These national mandates mean that the responsibility for data collection on this topic need not necessarily fall under the statistics department, but could be assigned to the Ministries of Energy or the Ministries of Women's Affairs, independently or in collaboration with each other. In the absence of a centralized source of sex-disaggregated labor participation data for the RE sub-sector, **the design and execution of targeted surveys that engage key actors in the sub-sector** is a more cost-effective and perhaps more reliable approach to collect primary data. Targeted surveys also have the advantage that they can be designed to include the specific questions needed to assess not only the participation percentage of women and men in the sub-sector, but additional information with regards to recruitment, retention, and access to equal opportunities. The latter would contribute to the assessment of labor conditions and the identification of existing gender gaps in the sub-sector.

This approach, however, **presents different challenges**. For example, national government institutions may not have the in-house technical knowledge to design these data collection tools, or the human and financial resources to extend these efforts over time, to establish a baseline and a monitoring process. Additionally, if national mandates are not clear to RE companies, it may be necessary for government representatives to engage

⁶³ UNEP and IUCN. (2018). Gender and environment statistics: Unlocking information for action and measuring the SDGs. UN Environment, Nairobi, Kenya. Obtained at: <https://www.unenvironment.org/resources/report/gender-and-environment-statistics-unlocking-information-action-and-measuring-sdgs>

⁶⁴ UN Statistics Division (2019) Minimum Set of Gender Indicators. A product of the Inter-agency and Expert Group on Gender Statistics. United Nations Statistics Division. 30 April 2019. Obtained at: <https://genderstats.un.org/files/Minimum%20Set%20Indicators%20web.pdf>

⁶⁵ IAEG-SDG (2019) Tier Classification for Global SDG Indicators. Inter-agency and Expert Group on SDG Indicators. 11 December 2019. Obtained at: <https://unstats.un.org/sdgs/files/Tier-Classification-of-SDG-Indicators-11-December-2019-web.pdf>

⁶⁶ UNEP and IUCN. (2018). Gender and environment statistics: Unlocking information for action and measuring the SDGs. UN Environment, Nairobi, Kenya. Obtained at: <https://www.unenvironment.org/resources/report/gender-and-environment-statistics-unlocking-information-action-and-measuring-sdgs>

⁶⁷ Personal communication with Laura Blanco, PhD., Lecturer, School of Economics, Universidad de Costa Rica. January 13th, 2020.

⁶⁸ Prebble, M. and Rojas, A (2017). Energizing Equality: The important of integrating gender equality principles in national energy policies and frameworks. IUCN and ENERGIA. Washington, D.C. USA. Obtained from: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-energizing-equality-web.pdf>

⁶⁹ Allen, A., Lyons, H. and Stephens, J.C. (2019). Women's leadership in renewable energy transformation, energy justice and energy democracy: Redistributing Power. Energy Research and Social Science. Vol. 57, November 2019. Obtained at: <https://www.sciencedirect.com/science/article/pii/S2214629619300829>

with companies to build trust so that they share their workforce composition data voluntarily.

The **most significant challenge is, however, the lack of explicit policy mandates requiring either the ministries of energy or women's affairs to actively engage in boosting and regularly monitoring women's participation in the sector.** A 2019 report corroborates the IUCN and ENERGIA findings, revealing that of the 13 countries assessed, eight reported not having examples of regulatory or policy measures to overcome gender gaps in the energy sector, with an additional country not mentioning or considering the question non-applicable. Nine countries indicated there is no entity devoted to the promotion of gender equality for public bodies in the energy sector, with seven providing a similar answer for private bodies in the energy sector. Additionally, five of the countries mentioned that there is no sex-disaggregated data available for the energy sector in their countries, with an additional four countries not responding or considering the question non-applicable. The report shows that this trend may be shifting with **one of the countries mentioning that sex-disaggregated data is being collected and another country setting steps to collect sex-disaggregated data,** and seven countries mentioning on-going discussions for taking future action related to sex-disaggregated data collection.⁷⁰

2.2.3. Different definitions in terms of scope, boundaries, and description of the sub-sector

The occupation and industrial classification comparison may **become more complex if data is required to include calculations of indirect employment related to the value chain and support services generated and not only direct jobs.** Using a solar photovoltaic (PV) example from the U.S. Department of Energy (DoE), this means that national categories would need to support the identification of direct jobs, generated by PV installation companies; indirect jobs, such as manufacturing jobs for PV equipment production and installation, transport, and services contracted by PV installation companies, such as tax and legal consulting services.⁷¹

However, this is not always possible, and when dealing with emerging economic activities, the specific ISIC codes or their national equivalents may not exist. Furthermore, for benefits identified to include induced jobs — those created by the expenditure of wages

of direct and indirect employees — the assessment needs to ensure that the codification of industries and economic activities allows the identification of the number of jobs that correlate to RE technologies.

Another difficulty to take into account when defining the participation of women and men in the RE sub-sector, which may be of particular importance for labor modeling purposes, is the need for a **clear definition of who is considered to be working in the sector.**

The definition could include only those working on the upstream or generation companies or be expanded to include transmission and distribution, as well as those jobs involved in the manufacturing and maintenance of the RE technologies.

Finally, a unique definition is needed to have a uniform or international standard for understanding participation in the sub-sector. However, some countries or researchers may define the **sector for data collection (for example, clean energy, low-carbon emission, or RE sector) differently.**⁷² The definitions chosen are vital as they may expand or reduce the number of generation technologies and value chains included in the assessment of women's participation in a specific sub-sector.

⁷⁰ C3E and IEA (2019) Status Report on Gender Equality in the Energy Sector. C3E International and the International Energy Agency (IEA). Obtained at: <https://www.globalwomennet.org/wp-content/uploads/2019/10/c3e-data-report-en-1.pdf>

⁷¹ Department of Energy (2017) U.S. Energy and Employment Report. U.S. Department of Energy. Obtained at: https://www.energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report_0.pdf

⁷² Personal communication with Davina Ngei, Communications Manager, Global Women's Network for the Energy Transition (GWNET). January, 28th, 2020.

Combining labor statistics and sectoral surveys: Experiences from the U.S. on data collection and reflections on the challenges for defining the scope of the RE sub-sector

The U.S. Department of Energy (DoE)'s 2017 US Energy and Employment Report (USEER) relies on **primary data collected through surveys** on behalf of the U.S. Department of Energy and **secondary data from the U.S. Bureau of Labor's Statistics (BLS) Quarterly Census of Employment and Wages (QCEW)** for Q1 of 2016,⁷³ to estimate the total labor force of the energy sector in the country.

The report includes information on different sub-sectors, including electric power generation and fuel technologies, which directly employed more than 1.9 million workers, of which 55% (1.1 million people) worked in traditional coal, oil, and gas. USEER estimates that solar firms employed close to 374,000 people, while wind companies employed 102,000 people. **The report estimates that women represented 32,6% of the solar labor force (with the same percentages of participation for solar PV and concentrated solar power companies), 32% of the wind labor force, and 31% of the low-impact hydroelectric labor force and 33.9% of the traditional hydroelectric labor force.**⁷⁴

The report sets out the challenges of collecting relevant data to understand the labor force in the energy sector, particularly related to RE. Although country-specific, the challenges identified may be common to governments in other regions.

One of these challenges relates to the classification of industries and activities. The BLS QCEW labor market data tracks employment across many energy production, transmission, and distribution sub-sectors. However, when cross-referenced with the North American Industry Classification System (NAICS) categories fall within business activities of other sectors, such as construction, trade, or professional services. USEER recommends the analysis of sub-sectors where overlap takes place, to understand employment trends in what it refers to as "emerging technologies," including wind, solar, geothermal, biomass, and hydrogen and fuel cells.

The report outlines some of **the limitations found in the BLS NAICS categories, which do not necessarily include all RE-related jobs**, as they do not filter job categories by energy technology. Residential solar installation companies provide an example of this limitation, as these companies are labeled as electrical contractors, which encompass other types of companies, including traditional energy generation. Therefore these companies may not be appropriately identified as RE actors if only the QCEW data is used to estimate jobs in the energy sector. In addition, development companies or building owners and not utilities own the generation plants in the solar and wind industries, meaning that labor data for this activity is found under the NAICS codes for construction rather than utilities.

The report also recommends **the use of supplemental surveys to capture complementary data as a solution for identifying these job categories**, a practice that the BLS has used consistently to determine additional information on upcoming industries, specific demographic profiles, or new labor trends. For the USEER analysis, 30,000 business representatives were surveyed to collect supplemental information to the BLS's QCEW. The limitation in capturing solar PV and CSP employment data provides another example. The lack of NAICS codes for identifying workers in solar utilities, as well as construction and value chain solar industries, means that the BLS only recorded jobs related to solar-specific generation (2,800 positions) for the USEER. However, additional data suggest that utilities only account for about 25% of solar jobs, meaning that the current categorization may not account for up to 75% of persons employed in the solar sub-sector.

Based on: Department of Energy (2017) U.S. Energy and Employment Report.

⁷³ Department of Energy (2017) U.S. Energy and Employment Report. U.S. Department of Energy. Obtained at: https://www.energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report_0.pdf

⁷⁴ Department of Energy (2017) U.S. Energy and Employment Report. U.S. Department of Energy. Obtained at: https://www.energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report_0.pdf

2.2.4. The complexity of developing a sound targeted approach to mapping women's participation in the energy sector by non-governmental actors

In recent years, efforts to map women's participation in the RE sub-sector have been coordinated, in most cases, by non-governmental actors, such as RE or women's associations, international organizations, or donor agencies. The need to engage in primary data collection at the national level means that an entity or project seeking to understand the participation rate of women and men in the RE sub-sector **requires time and resources** for engaging with key RE actors at the national level.

Unlike ministries of energy, these actors may not have the backing of a national mandate for data collection. Therefore it is necessary **to provide RE companies, who are the subject of their research, with a rationale on the importance of sharing their information for analysis and the benefits they may receive from this exchange**. Examples could include compliance with national regulations or guidance on increasing or improving the participation of women in their labor force. The process also requires trust-building with the companies, as information on labor participation, and particularly on human resources policies—including recruitment procedures and salary and compensation schemes—is sensitive. Therefore, for companies to volunteer such information to external actors, they need assurances of **confidentiality in the use and analysis of the information shared**.⁷⁵

Once engaged, RE companies may require time to provide the requested data, as empirical evidence shows that companies may not necessarily disaggregate their labor force databases by sex. When energy companies engage in efforts to address gender equality in their workforce, **one of the first steps in their approach is to build a sex-disaggregated database that will become the baseline for future measures in terms of the numbers and satisfaction of women joining the sector**.⁷⁶ When companies do record participation in a sex-disaggregated manner, they may not necessarily make this information publicly available on their websites, as it may be considered sensitive. Therefore, even where data exists, it is not necessarily open access. Hence, data collection processes should be transparent and provide companies with sufficient assurances to make information available.

Other relevant actors who can contribute to sub-sector specific data collection processes include the **professional associations of engineers, vocational training institutes, universities, or the ministries of education and labor could also be valuable sources of information**. These institutions have access to data on the number of women and men who enroll in studies that are relevant to the RE sector but may not necessarily track students' employment rates once they leave the education centers. To further understand the labor composition of the RE sub-sector, a coordinated effort for data collection and sharing could ensure that information from these actors are complimentary and analyzed in a manner that can provide insights on the future availability of women and men in the sector. Trust-building processes with these actors also need to be factored in when designing the survey and engagement process for data collection.

2.3. NEAR-NDC exploration of women's participation in renewable energy

In an effort to assess green job creation under NDC targets for RE in Indonesia, Mexico and Rwanda, GGGI's NEAR-NDC project piloted efforts to identify sex-disaggregated data on labor composition and the existing pipeline of future professionals in two countries: Mexico and Rwanda. The decision to focus on these two countries was based on knowledge of existing national commitments towards gender equality in NDC actions and the energy sector, and indications that efforts to account for women's enrollment in the energy sector had already taken place at the national level. The identification of data sources included a literature desk review, secondary research, and interviews with key sources working on **gender and energy intersections in Mexico and Rwanda**.

The research confirmed that there were no centralized databases that could provide sex-disaggregated data on the labor composition of the RE sub-sector in these

⁷⁵ Personal communication with Laura Blanco, PhD., Lecturer, School of Economics, Universidad de Costa Rica. January 13th, 2020.

⁷⁶ Engility Corporation (2016) Engendering Utilities: Improving gender diversity in power sector utilities. Developed for USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment. Washington, DC. January 2016 Obtained from: https://unfccc.int/files/gender_and_climate_change/application/pdf/engendering_utilities.pdf

two countries. **Data sources found on women's participation related to either a specific utility⁷⁷ or to data for the energy sector as a whole, not the RE sub-sector in particular.**⁷⁸ Furthermore, the lack of access to primary data means it was not possible to rely on the information found to produce proxies for assessing women's participation in the RE sector or model their future participation under the NEAR-NDC project timeline.

Sections 2.3.1 and 2.3.2 provide a summary of the findings on women's participation in the energy sector in Mexico and Rwanda, and where possible, in the RE sub-sector. Further information on national offices collecting and monitoring aspects of the sex-disaggregated data required for tracking women's participation in the RE sector is also provided.

2.3.1. Mexico

Mexico has consistently identified **gender equality as a cross-cutting issue** in its climate change policies and the norms regulating its energy transition. As such, Mexico's 2012 Framework Law on Climate Change recognizes the need to incorporate gender considerations when developing local programs. Mexico also expressed the commitment to address gender equality in climate-related actions in its 2015 NDC, noting that climate change policies and actions include human rights and gender perspective as a cross-cutting issue. The NDC, therefore, calls for the implementation of measures taking women into account as critical decision makers regarding energy consumption.⁷⁹

Furthermore, the "Sexta Comunicación de Cambio Climático," includes the latest RE targets for Mexico, aiming at 35% generation by 2024, 40% by 2035, and 50% by 2050. This sixth national communication also recognizes women as powerful agents of change who play an essential role in mitigation and adaptation

actions. Its section on green growth also acknowledges the linkages between energy access and efficiency and their contributions to the SDGs, including women's empowerment.⁸⁰ Meanwhile, the Plan Nacional de Desarrollo 2019-2024 commits to engaging local communities in the development of RE projects and calls for the energy transition to support the development of a social segment in the energy sector capable of strengthening the industrialization of the country.⁸¹

Sex-disaggregated data collection is required to track how actions towards an energy transition may benefit women and increase their participation in the RE sector. In principle, this should not be an issue for the country, as Mexico's **Instituto Nacional de Estadísticas y Geografía (INEGI)** is a strong statistics office that combines socio-economic data with geographical information, making regional and georeferenced information available. Moreover, INEGI is a leading institution when it comes to sex-disaggregated data collection, which is not only addressed in its data collection tools but has also been guided by **a Specialized Technical Committee on Information on a Gender Perspective** since 2010.⁸²

However, the 2007⁸³ and 2013⁸⁴ industrial codes (NAICS) used for subsequent socio-economic surveys show that the energy sector was considered as a unit, with generation, transmission, and distribution bundled under code 221110 without distinguishing between generation sources. Therefore, although sex-disaggregated data was collected, the industrial codes may not allow for a distinction between people working in RE and people working in fossil fuel generation. Differentiation may become possible with **the 2018 revision of industrial codes, which does distinguish between generation sources, including hydro (code 221112), solar (code 221113), and wind (code 221114).**⁸⁵ The next general population census surveys are scheduled to start in early 2020. They will provide an opportunity to collect and report on labor participation in the RE sub-sector in a sex-disaggregated manner, using the revised NAICS codes.

⁷⁷ In Rwanda, the main utility, Rwanda Energy Group conducted an internal review of its personnel, identifying 18% of its labor force were women. Kuteesa, H. (2019) Move to entice more young women engineers to join the energy sector. Article. The New Times. May 17th, 2019. At: <https://www.newtimes.co.rw/news/move-entice-more-young-women-engineers-join-energy-sector>

⁷⁸ Processes for identifying women's participation and their perceptions on the work environment in the energy sector have been conducted both in Mexico and Rwanda by different non-governmental actors. These reports are mentioned in the following sections.

⁷⁹ Mexico (2015). Intended Nationally Determined Contribution. Obtained from: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Mexico%20First/MEXICO%20INDC%2003.30.2015.pdf>

⁸⁰ SEMARNAT and INECC (2018). Sexta Comunicación Nacional y Segundo Informe Bial de Actualización ante la Convención Marco de Naciones Unidas sobre el Cambio Climático. Mexico. Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT) and Institution Nacional de Ecología y Cambio Climático. Mexico City. Mexico. Obtained from: <http://cambioclimatico.gob.mx:8080/xmlui/handle/publicaciones/117>

⁸¹ Presidencia de la República (2019) Plan Nacional de Desarrollo 2019-2024. Mexico City. Mexico. Obtained from: <https://lopezobrador.org.mx/wp-content/uploads/2019/05/PLAN-NACIONAL-DE-DESARROLLO-2019-2024.pdf>

⁸² UNEP and IUCN. (2018). Gender and environment statistics: Unlocking information for action and measuring the SDGs. UN Environment, Nairobi, Kenya. Obtained at: <https://www.unenvironment.org/resources/report/gender-and-environment-statistics-unlocking-information-action-and-measuring-sdgs>

⁸³ INEGI (2008). Sistema de Clasificación de América del Norte, México. SCIAN 2007. INEGI. Aguas Calientes, México.

⁸⁴ INEGI (2013) Sistema de Clasificación de América del Norte, México. SCIAN 2013. INEGI. Aguas Calientes, México. Obtained at: http://internet.contenidos.inegi.org.mx/contenidos/Productos/prod_serv/contenidos/espanol/bvinegi/productos/clasificadores/SCIAN/SCIAN_2013/702825051693.pdf

⁸⁵ INEGI (2018). Sistema de Clasificación Industrial de América del Norte, México 2018, SCIAN México 2018- Clasificación Industrial Internacional Uniforme Rev. 4, CIIU Rev. INEGI. México. Obtained at: <https://www.inegi.org.mx/contenidos/app/scian/tablaiv.pdf>

At least two different organizations have conducted independent studies to understand women's participation and perceptions of their labor conditions in the energy sector. One of these organizations is **Cluster Energía Coahuila**, which developed a gender baseline study for the energy sector in 2019, with the financial support of the British Embassy in Mexico. Based on data by INEGI, the report states that the energy sector in Mexico absorbs a small proportion of people employed in the industrial sector, with women accounting for only 19% of those working in the energy sector. The report states that 9 out of 10 women in the energy sector work either in Petroleos Mexicanos (PEMEX, the national petroleum company) or for the Comisión Federal de Electricidad (CFE, the national utility).⁸⁶ The report does not specify if the other 10% of women work exclusively in RE companies.

This situation may change in the future. The **Red de Mujeres en Energía Renovables y Eficiencia Energética (REDMEREE)**, a network of women working in renewables and energy efficiency, developed a report titled *Hoja de Ruta de Género para la Transición Energética* in cooperation with GIZ. The report found that in the 2018 period, 1,203,745 students in Mexico were registered in careers related to the energy sector, of which 33% or 398,330 were women. **Of these women, 57% study conventional energy topics (compared to 76% of men), while 43% study renewable or sustainable energy topics (compared to 24% of men).** These figures show that more women are interested in RE studies than men.⁸⁷ Based on this information, women seem to be more prepared to join the RE sub-sector at entry-level than their male counterparts, suggesting their participation will increase soon.

The Cluster Energía Coahuila report contains a diagnostic on the number of women who participate in the energy sector in six States (Campeche, Jalisco, Nuevo Leon, Sonora, Tabasco, and Veracruz). Although the report notes that the State of Sonora has the highest potential for developing RE projects out of those assessed, data regarding women's participation is provided for the energy sector as a whole and is not

further disaggregated based on the energy source. **In Sonora, women account for 21% of the energy labor force, scoring slightly higher than the average for all States.** Women also seem to be overrepresented in administrative, accounting, and management positions, following a similar trend to other States analyzed in the report.⁸⁸

The gender baseline also confirms that one of the main barriers to increasing women's participation in the energy sector at large, and the RE, in particular, is their low enrollment in **technical and vocational education and training (TVET)**. TVET includes STEM programs, where women represent only 28% of total enrollments. Women's low participation in the pipeline must be addressed if there is a real interest in increasing their numbers in the RE sector.⁸⁹

The NEAR-NDC job assessment found **that the creation of capacities for joining the RE sector may not be taking place in States where RE projects will be established.** This finding means that for women and men to join and benefit from new job opportunities, they need easy access to information on labor opportunities and assurances on benefits for relocating to other States within Mexico.

Regarding the need to support women and men to migrate to other States to join RE projects, companies should **ensure that women and men have equal knowledge of and access to relocation benefits and packages.** Companies practice this in other countries, such as Morocco, where MASEN, a national utility company, ensures that women and men receive compensation packages for their relocation to the project sites.⁹⁰ Elements related to increasing benefits and seeking locations close to major economic areas where relatives can find labor opportunities may also have a positive effect on women's willingness to migrate to join the RE sector.⁹¹ Moreover, initiatives such as REDMEREE⁹² can be instrumental in sharing information on the existence of job opportunities, relocation benefits, and the skills women require to join the RE sector.

⁸⁶ Cluster Energía (2019). Gender Baseline Study for the Energy Sector in Mexico. UK Prosperity Fund. British Embassy in Mexico. Coahuila, Mexico.

⁸⁷ REDMEREE (2018) *Esfera Académica: Estudiantes. Hoja de Ruta de Género para la Transición Energética*. Mexico City, Mexico. Presentation by Sandra Caballero. REDMEREE and GIZ.

⁸⁸ Cluster Energía (2019). Gender Baseline Study for the Energy Sector in Mexico. UK Prosperity Fund. British Embassy in Mexico. Coahuila, Mexico.

⁸⁹ Cluster Energía (2019). Gender Baseline Study for the Energy Sector in Mexico. UK Prosperity Fund. British Embassy in Mexico. Coahuila, Mexico.

⁹⁰ Rojas, A.V., Siles, J. and Owren, C. (2019). Gender Mainstreaming in Climate Change Projects: The case of NOOR Ouarzazate in Morocco. AfDB, CIF and IUCN. Obtained at: <https://www.afdb.org/en/documents/gender-mainstreaming-climate-change-projects-case-noor-ouarzazate-morocco>

⁹¹ According to research under the Engendering Utilities initiative, women might not consider applying or accepting positions that required them to move to a new location without a relative or their husband; a situation that negatively influences women's desire to move to rural areas, where renewable energy projects tend to be located. This contributes to the difficulty of hiring women in rural areas. Engility Corporation (2016) *Engendering Utilities: Improving gender diversity in power sector utilities*. Developed for USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment. Washington, DC. January 2016. Obtained from: https://unfccc.int/files/gender_and_climate_change/application/pdf/engendering_utilities.pdf

⁹² REDMEREE is a network launched in 2016, with the aim of bringing together efforts to achieve strong women's participation in the energy sector. Individuals and companies can join the network, which organizes training opportunities for professional women and secures opportunities for female students to increase their participation in the energy sector. Information on REDMEREE can be found on LinkedIn here: <https://www.linkedin.com/company/redmerree-red-de-mujeres-en-energ%C3%ADa-renovable-y-eficiencia-energ%C3%A9tica/> or on Facebook here: <https://www.facebook.com/redmujeresenergia/>

Cluster Energia Coahuila's report states that although most companies working in the energy sector have been certified under the **Mexican Standard on Labour Equality and Non-Discrimination NMX-R-25-SCFI-2015**, in place since 2015, women do not feel they receive equal treatment at work. Furthermore, women who participated in the surveys and focus groups organized as part of the 2019 research **expressed that they found barriers to their participation in the sector**. Barriers related to balancing family and professional life are among the most important ones, with about 30% reporting that they had young children and 20% reporting pregnancy as preventing them from moving forward in their careers. Additionally, 30% of women surveyed mentioned having suffered sexual or other types of harassment in their workplace. Finally, women feel there is a preference for hiring women for support tasks, such as administration (close to 45%), secretarial positions (close to 40%), and cleaning (20%).⁹³

These findings are in line with the 2018 REDMEREE study findings, which showed that **39% of women surveyed had interrupted their careers** in the energy sector due to their maternity leave, the responsibility of taking care of their family, illness, or continuing their education. In contrast, only 25% of men mentioned taking a pause from their work due to illness, studies, or lack of job opportunities, and only 2% identified taking care of a family member as a reason for interrupting their career. None of the interviewed men mentioned taking paternity leave or other types of leave for taking care of their children, although 66% of them reported being parents.⁹⁴

2.3.2. Rwanda

Gender equality, particularly at the highest decision-making levels, has significantly increased in Rwanda in recent years. Currently, Rwanda ranks 9th out of 153 countries on gender parity in the WEF Global Gender Gap Index for 2020, and 4th in the index for political

empowerment, with **50% of parliamentarians being women**. According to the WEF report, Rwanda is one of the few countries that has closed at least 75% of the wage gap between women and men. Moreover, it is estimated that at least as many women as men participate in the labor market in Rwanda.

According to its Constitution, the Rwandan government has a target to achieve 30% women's representation at all levels. Women's participation is also seen as key to addressing the energy access challenges faced by the country. **Rwanda's 2015 Energy Policy** calls for the **encouragement of girls to study STEM subjects** and courses related to energy technologies and basic engineering, as a specific measure to mainstream gender in the sector.⁹⁵ Perhaps most importantly, the Rwanda Energy Policy **aims at addressing women's participation in the energy value chain**, calling for the meaningful incorporation of women in the planning, design, and execution of energy programs.⁹⁶

Furthermore, the Ministry of Infrastructure (MININFRA) developed the **Infrastructure Gender Mainstreaming Strategy 2017-2022** in 2018, with GGGI support, through the identification of gender gaps and entry points in the sector.⁹⁷ The strategy **aims at achieving the equal participation of women and men in the sector** by enhancing job opportunities and strengthening the capacities of infrastructure developers to address gender equality.⁹⁸ Political support for increasing women's participation also seems to be strong in Rwanda. The Permanent Secretary at the Ministry of Infrastructure, Patrice Uwase, recently commented that if Rwanda wants to achieve universal access to electricity in 2024, it will require the participation of all actors, of which women need to be an important part.⁹⁹

The national commitments mean that government utilities, such as the Rwanda Energy Group (REG),¹⁰⁰ need to put measures in place to ensure that women make up at least 30% of the labor force. Efforts to boost women's participation in REG included launching a

⁹³ Cluster Energia (2019). Gender Baseline Study for the Energy Sector in Mexico. UK Prosperity Fund. British Embassy in Mexico. Coahuila, Mexico.

⁹⁴ Luna Medina, N. (2018). La brecha de género en el sector energético de México. Article. Investigación y Desarrollo, December 16th, 2018. At: <https://invdes.com.mx/los-investigadores/la-brecha-de-genero-en-el-sector-energetico-de-mexico/>

⁹⁵ Prebble, M. and Rojas, A. (2017). *Energizing Equality: the importance of integrating gender equality principles in national energy policies and frameworks*. Washington, USA. IUCN and USAID, at: <https://genderandenvironment.org/resource/energizing-equality-the-importance-of-integrating-gender-equality-principles-in-national-energy-policies-and-frameworks/>

⁹⁶ Parshotam, A. and van der Westhuizen, H. (2018). Women and the Energy Value Chain: Opportunities for a more inclusive renewable energy sector in Africa. Discussion Paper. October 2018. Global Economic Governance Africa (GEGAfrica).

⁹⁷ GGGI Rwanda (2018). Country Brochure. Rwanda. GGGI Country Office. Obtained at: https://gggi.org/site/assets/uploads/2018/11/FINAL-Rwanda-Country-Brochure_20th-September-2018.pdf

⁹⁸ Parshotam, A. and van der Westhuizen, H. (2018). Women and the Energy Value Chain: Opportunities for a more inclusive renewable energy sector in Africa. Discussion Paper. October 2018. Global Economic Governance Africa (GEGAfrica).

⁹⁹ Personal communication with Ana Perez, Senior Gender Technical Advisor on the Learning, Energy, and Environment for Development, RTI's International Development Group. November 11th, 2019.

Kuteesa, H. (2019) Move to entice more young women engineers to join the energy sector. Article. The New Times. May 17th, 2019. At: <https://www.newtimes.co.rw/news/move-entice-more-young-women-engineers-join-energy-sector>

¹⁰⁰ The REG Ltd. and its two subsidiaries – the Energy Utility Corporation Ltd. and the Energy Development Corporation Ltd (EDCL)—are the government's energy development and utility service deliver companies.

Gender Mainstreaming Program in March of 2018. At the time of the launch, only 18% of the total staff of the REG were women.¹⁰¹ The gender equality commitments also influence the work and attitude of private companies, with empirical research finding that energy companies are convinced of the need to increase women's participation in the energy sector. However, the private sector is at a stage where they require guidance to address gender considerations in their human resource policies and practices.¹⁰²

Rwanda's electrification rates are low, with only 30% of its population having access to electricity nationwide. The problem is much more severe in rural areas, where only 12% of the population has access to electricity.¹⁰³ In this context, efforts at the national level include off-grid technologies, allowing the opportunity for social enterprises, which lead in the use of gender approaches to business modeling, to participate in the sector's development.¹⁰⁴ Government implemented programs are also increasingly addressing gender equality as part of their components.

For example, the **Electricity Access Roll-out Program (EARP)**, which ran between 2009 and 2018, was designed to accelerate national electrification rates and included participation quotas in village-level energy enterprises. A recent study showed that quotas were responsible for increasing women's participation by between 10 and 50%. The study also showed that, at a minimum, the revenues of enterprises do not decrease when putting female participation quotas into place. However, all-women female teams performed 9% better than all-male teams. Perhaps the most substantial benefit of increasing women's participation is seen in the increased time their children dedicate to study and their reported ambition to continue studying and to work in their area of interest later on.¹⁰⁵

Despite all the above, tracking women's participation in the energy sector does not seem to be taking place in a centralized manner. Consultations with national experts have shown that the socio-economic survey at the national level may not be collecting the information required to disaggregate the women's and men's participation in the energy sector.¹⁰⁶ Moreover, **although the Ministry of Gender and Family has a Gender Monitoring Office (GMO)**,¹⁰⁷ which reports on the Status of Gender Equality in the country, it seems that this office may not yet have access to sex-disaggregated data for the energy sector as a whole. Their latest report mentions women's participation in charcoal cooperatives reaches 44.6% of producers but does not provide their participation in other energy sub-sectors.¹⁰⁸ The Ministry has also been tasked by the Rwandan Government to be the entity responsible for monitoring progress towards the principle of mainstreaming gender equality into national actions under its Rapid Assessment and Gap Analysis (RAGA). The RAGA is one of the instruments developed by SEforALL to guide plans for achieving universal energy access.¹⁰⁹

Within this context, a gender audit of the energy sector in Rwanda was conducted by USAID Power Africa's East Africa Energy Program, the main platform for implementing the Women in Rwandan Energy (WIRE) Activity, a project recently funded by the White House-led Women's Global Development and Prosperity (W-GDP) Initiative. The aim of the gender baseline assessment was to assess the gender diversity of the workforce and build an understanding of existing gender gaps to identify how WIRE could advance Rwanda's goal of increasing women's participation in the energy sector. The WIRE assessment **reached 11 of the 25 energy companies working in Rwanda**, including on-grid, off-grid, and independent power producer companies, covering a total of 2300 people.

¹⁰¹ van Hilbergen, E. (2018). Empowering Women to Energize Rwanda. Blog for ENABEL. May 7th, 2018. Obtained at: <https://open.enabel.be/en/RWA/2007/595/u/empowering-women-to-energize-rwanda.html>

¹⁰² Perez, A (2019). Women in Rwandan Energy. Presentation at Partners' Meeting. Kigali, Rwanda. November 7th, 2019.

¹⁰³ IEA (2017). Energy Access Outlook 2017: From Poverty to Prosperity'. Energy Outlook. International Energy Agency (IEA). Obtained at: https://www.researchgate.net/publication/320584101_Energy_Access_Outlook_from_Poverty_to_Prosperty_World_Energy_Outlook-2017_Special_Report

¹⁰⁴ This efforts seem to be heavily focused on on rural initiatives, where women are engaged as retailers of solar home systems or solar powered retail outlets. Parshotam, A. and van der Westhuizen, H. (2018). Women and the Energy Value Chain: Opportunities for a more inclusive renewable energy sector in Africa. Discussion Paper. October 2018. Global Economic Governance Africa (GEGAfrica).

¹⁰⁵ University of Cape Town, IPA (2019) Female microenterprise creation and business models for private sector distribution of low-cost off-grid LED lighting: Multiple Randomized Experiments, ENERGIA. Obtained at: <https://www.energia.org/cm2/wp-content/uploads/2019/04/RA5-Female-microenterprise-creation.pdf>

¹⁰⁶ Personal communication with Emmnaule Ganza, Consultant, GGGI Rwanda. November 11th, 2019. Additionally, the UN Statistics National Classification Database does not contain information on Rwanda's ISICs to confirm the type of classification that may be used in the socio-economic surveys. UN Statistics Division (n.d.) Currently Active Classifications in the National Classifications Database. . Statistics Division. Department of Economic and Social Affairs. UN. Obtained at: https://unstats.un.org/unsd/classifications/nationalclassifications/National_classifications_by_country_180413.pdf

¹⁰⁷ The Gender Monitoring Office (GMO) monitors how gender equality principles are respected at all levels of governmental, private, non-governmental and religious institutions in Rwanda. It also monitors how the national gender policy is implemented in all spheres of national development, and the domestication, implementation and reporting on all regional and international gender commitments that Rwanda has ratified. For more information on the GMO please visit: <http://www.gmo.gov.rw/index.php?id=560>

¹⁰⁸ GMO (2019). The State of Gender Equality in Rwanda: From transition to transformation. Republic of Rwanda. Supported by UN, Sweden, CARE. Kigali, Rwanda. Obtained at: http://gmo.gov.rw/fileadmin/user_upload/Researches%20and%20Assessments/State%20of%20Gender%20Equality%20in%20Rwanda.pdf

¹⁰⁹ Prebble, M. and Rojas, A. (2017). The enabling power of energy in promoting gender equality: Gender in the SEforALL country action process documents. IUCN and USAID. Washington D.C., U.S. November 2017 version. Obtained at: https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-seforall-web_0.pdf

The gender assessment revealed that before the research, the companies did not necessarily record their labor composition in a sex-disaggregated manner. The audit also found that there was a balance between the number of internships for women and men, on average. However, this balance did not extend to other levels of engagement, where women represent 5% of technicians, close to 36% of middle staff, 18% of senior managers, and about 17% of directors.¹¹⁰ **Preliminary results of the audit were presented at a conference in November 2019, showing that, on average, women made up 20% of the labor force in the private energy sector and confirming that their participation reached 18% in the public energy sector.**¹¹¹

According to the research findings, the private sector does not routinely advertise all open positions as is the practice in the public sector (where all hiring is channeled through the Ministry of Labor). Instead, available positions are shared by “word of mouth,” meaning that the information tends to remain in male-only groups as men make up the majority of the energy sector. Besides, when positions were announced, there were no actions directed at ensuring a gender-balanced pool of candidates. There is also an observed difference in attitude towards job searching in Rwanda, where women appear to wait for announcements to be made public while men actively reach out to energy companies. This combination of factors may require further attention to ensure that job vacancies and internship opportunities are shared through channels reaching female and male candidates. Hence, **transforming the recruitment processes as well as early engagement with universities and technical training institutes to advertise internships could play an important role in changing the participation rates of women, at least at the entry point.**¹¹²

Moreover, WIRE research found that there is little to no **cooperation between companies and universities to advertise new positions** or to organize internship opportunities. This finding may be important to address, as the research also showed that women who graduate from university on STEM or related careers do not always find a job in the energy sector at the same rate as men.¹¹³

Additionally, national initiatives to support women in the energy sector can also play a vital role in socializing information on job opportunities in the sector. The

Women in Rwanda Energy (WIRE) Network in Rwanda was launched in 2019, to secure a space for women to come together and carry out sensitizations and provide career guidance to fellow women on opportunities in the energy sector. In addition, the network aims to reach out to school attending girls to increase their interest in STEM subjects to strengthen their opportunities to join the energy sector later in their lives.¹¹⁴

The NEAR-NDC research showed that, in the case of Rwanda, securing national human resources for the RE sector is one of the main focal points when projecting the future labor market. Sixty percent of the labor for technology-related tasks is imported – as technologies come from abroad, so too do the experts who oversee their use.¹¹⁵ Finding women to join the energy sector is particularly challenging, due to their reduced numbers in STEM-related subjects. Anecdotal evidence shows that women account only for 2% of the civil engineers registered by 2012 in the Engineers Association in Rwanda, or 15% of engineering students at the university level.¹¹⁶ In this sense, **outreach such as the one planned by the WIRE network to target girls and young women to join STEM-related careers may be instrumental in ensuring a greater interest from girls in RE related subjects** and increase the pipeline of candidates.

2.4. Other initiatives tracking women's participation in the energy sector

2.4.1. International data collection efforts on women's participation in the energy sector

As mentioned throughout the previous sections, it is difficult to identify a centralized source of sex-disaggregated data on the labor composition of the RE sub-sector. To fill this information void, IRENA has recently been spearheading efforts to document women's participation in the RE sector. **IRENA** began

¹¹⁰ Perez, A (2019). Women in Rwandan Energy. Presentation at Partners' Meeting. Kigali, Rwanda. November 7th, 2019.

¹¹¹ Personal communication with Emmnaule Ganza, Consultant, GGGI Rwanda. November 11th, 2019.

¹¹² Personal communication with Ana Perez, Senior Gender Technical Advisor on the Learning, Energy, and Environment for Development, RTI's International Development Group. November 11th, 2019.

¹¹³ Personal communication with Ana Perez, Senior Gender Technical Advisor on the Learning, Energy, and Environment for Development, RTI's International Development Group. November 11th, 2019.

¹¹⁴ Kuteesa, H. (2019) Move to entice more young women engineers to join the energy sector. Article. The New Times. May 17th, 2019. At: <https://www.newtimes.co.rw/news/move-entice-more-young-women-engineers-join-energy-sector>

¹¹⁵ Personal communication with Emmnaule Ganza, Consultant, GGGI Rwanda. November 11th, 2019.

¹¹⁶ Personal communication with Emmnaule Ganza, Consultant, GGGI Rwanda. November 11th, 2019.

recognizing the gender dimension of RE with its 2012 report on jobs and energy access, and dedicated a full chapter in its 2013 jobs report to the gender dimension of RE deployment, both in modern settings and in the context of energy access. The chapter contains valuable analysis, including opportunities and constraints associated with the increasing involvement of women in the sector and their potential role in addressing the skills gap, all of which remain true and relevant today.¹¹⁷

These efforts have been followed by the inclusion of sex-disaggregated data in subsequent reports, for the sectors and countries where this information is available, for example, with recurrent mentions of women's participation in the solar sector in the U.S. Perhaps most importantly, IRENA developed a specific report on 2019 containing the latest effort by the agency to gather sex-disaggregated data for the RE sector globally. The report presents findings extracted from 1440 voluntary surveys submitted to IRENA by 1155 individuals and 285 companies working in the RE sector in 144 countries. Based on the answers received, IRENA has estimated that women's representation in the RE sector is close to 32%, with women accounting for 46% of the administrative workforce of the respondent companies, 28% of the technical staff, and 32% of senior management posts.¹¹⁸

IRENA's report presents further information on the barriers women face to joining the RE sector. Among the main challenges reported through the surveys are gender roles, in conjunction with cultural and social norms, and prevalent hiring practices. Norms relate to the social stereotypes for expecting mainly men to participate in the RE sector, and the demands on women to fulfill care activities for their families. Prevalent hiring practices could be the result of male-biased cultural and social norms and are, therefore, also a variation of the top two barriers previously mentioned.¹¹⁹

In parallel to the efforts by IRENA, other organizations have attempted to track women's participation in the energy sector at large or in different sub-categories of analysis, such as women's leadership and participation in segments of the energy value chain. One of these efforts was conducted by **NES Global Talent and Energy Jobline**, which launched a Women in Energy Global Study in 2018 to understand the elements required to retain women in the energy sector. The study used a

survey-based methodology in 10 countries. The sample was of 1200 women working in the energy sector, most of whom were from the U.S. (24%) and the UK (20%). The majority of respondents (57%) mentioned working in the oil and gas sector, with only 10% of respondents working in RE.¹²⁰

The study found that **the RE sub-sector** has the best female representation, with women making up 63% of the sector. It concludes that this is due to young women's preference at the start of their careers to join a sector **that they perceive as modern and environmentally friendly**. Forty-eight percent of surveyed women in the RE sector reported having between 1-5 years of experience, and 16% mentioned having less than a year of experience. The study also found that, among surveyed women, the majority were employed in engineering (39%) and management (28%) positions. The study also identifies different requests from women to their employers in the energy sector to increase retention rates.¹²¹

Concerning the participation of women in utilities, **IUCN and Power Africa** conducted an assessment in sub-Saharan Africa (SSA) in 2019. The assessment was intended to provide a new baseline to understand women's roles and leadership in utilities in the region, so that future progress of women's participation in the sector can be contrasted against it. The report found that women hold 52, or 21% of the 243 energy utility board positions in SSA and only three out of 47, or 6% of top utility leadership positions such as CEO or president.¹²²

The IUCN and Power Africa report sought to gather information on the job composition of utilities through the distribution of on-line surveys and follow up interviews with human resource managers. The sample of responding utilities suggests that women may comprise 16-35% of the labor force in the SSA energy sector, with the majority reporting that the women's labor force participation rate is between 16-20%.¹²³ Additionally, **this analysis identifies some of the interventions implemented by SSA utilities**, such as on-campus recruiting activities, mentorship programs, and sexual harassment policies, which can serve as guidance for energy companies for revising and improving their human resource practices.

¹¹⁷ IRENA (2013) Renewable Energy and Jobs. International Renewable Energy Agency. Abu Dhabi, United Arab Emirates. Obtained at: [https://www.irena.org/publications/2013/Dec/Renewable-Energy-and-Jobs-\(2013\)](https://www.irena.org/publications/2013/Dec/Renewable-Energy-and-Jobs-(2013))

¹¹⁸ IRENA (2019b). Renewable Energy: A Gender Perspective. At: <https://www.irena.org/publications/2019/Jan/Renewable-Energy-A-Gender-Perspective>

¹¹⁹ IRENA (2019b). Renewable Energy: A Gender Perspective. At: <https://www.irena.org/publications/2019/Jan/Renewable-Energy-A-Gender-Perspective>

¹²⁰ NES Global Talent and Energy Jobline (2018). Women in Energy Global Study. Obtained at: <https://www.theogtc.com/media/2411/woman-in-energy-global-study.pdf>

¹²¹ NES Global Talent and Energy Jobline (2018). Women in Energy Global Study. Obtained at: <https://www.theogtc.com/media/2411/woman-in-energy-global-study.pdf>

¹²² Prebble, M and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan African energy utilities. An IUCN EGI brief. IUCN, Power Africa and USAID. Washington D.C., U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹²³ Prebble, M and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan African energy utilities. An IUCN EGI brief. IUCN, Power Africa and USAID. Washington D.C., U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

Along a similar line, the **Sustainable Energy For All (SEforALL)** initiative produced a working paper in 2018 to analyze existing data and evidence on women's empowerment across the global energy sector and identify existing gaps, barriers, and good practices to address women's empowerment. The research included an analysis of national policies and assessed 85 companies working in the energy value chain. The working paper identified that information on labor composition and human resource policies is limited and not publicly available. Based on the information obtained, only 33 out of the 85 companies had at least one policy that would support gender equality or women's participation in its labor force, or both. Furthermore, even when inclusion policies were present, the research showed that there was little focus on educational programs or other human resource measures to increase diversity, and that there was a lack of performance indicators accompanying the policies.¹²⁴

In 2019, the **Clean Energy, Education, and Empowerment (C3E) initiative, in collaboration with the International Energy Agency (IEA)**, launched a report on women's participation in the energy sector. The report analyzes a database built using publicly available information from 160 private energy companies, with 8% categorized as RE companies. The report provides information on women's participation in leadership positions, finding that, on average, women hold 20% of board seats and 18% of management positions. Sex-disaggregated data on employment from 135 of those companies show that women represent, on average, 23% of labor positions in those companies.¹²⁵

Other data collection efforts have focused on **analyzing women's participation in high-level decision making positions**. For example, a 2015 report found that at the time, women occupied only 4% of the Chair positions and 18% of the Secretary positions at the World Energy Council (WEC). The report also found that only 12% of energy ministries worldwide were headed by women.¹²⁶ The above-mentioned C3E report also did a deep-dive

on women's participation in seven developed countries, looking at the women's participation at ministries of energy for the period 1980 to 2017. During this period, Sweden ranked the highest in terms of participation, with women making up 31% of its energy ministries, followed by Canada, where women held 24% of those positions.¹²⁷ The other five countries had participation rates between 11% and 16%, which are more consistent with the world average estimated by the 2015 report.

2.4.2. Experiences mapping women's participation in the energy sector at the national level

As mentioned earlier, the US Department of Energy (DoE) developed a report on employment in the energy sector in 2017, which included demographic information for different sub-sectors of the industry. In light of the DoE's decision not to publish the same report in 2018 and 2019, **the Energy Futures Initiative (EFI) and the National Association of State Energy Officials (NASEO) developed a similar report in 2019**, using a similar survey methodology and data sources. The report provides demographic information including women's participation, **estimating that by 2018 women comprised 31% of the labor force in a solar PV generation, 33% in concentrated solar power, 32% in wind electricity generation, 32% in low-impact hydropower, and 34% in traditional hydropower generation**.¹²⁸ Although women's average participation in RE is lower than the average national participation of 47%, women seem to be better represented in renewables than in fossil fuel sub-sectors. In petroleum, women account for 23% of the labor force, and in coal, they represent 22% of employees.¹²⁹ The report includes cross-cutting information, estimating the labor force of different value chains, from manufacturing and construction to transmission to service provision, and sub-sectoral occupational distribution. However, data at that level of analysis is not presented in a sex-disaggregated manner.¹³⁰

¹²⁴ SEforALL (2018). Evaluating Governance and Business Landscapes Of Women's Empowerment in Sustainable Energy. People-Centered Accelerator Working Paper. Vienna, Austria. SEforALL. Obtained at: https://www.seforall.org/sites/default/files/gather-content/Women_Empowerment_Sustainable_Energy_0.pdf

¹²⁵ C3E and IEA (2019) Status Report on Gender Equality in the Energy Sector. C3E International and the International Energy Agency (IEA). Obtained at: <https://www.globalwomennet.org/wp-content/uploads/2019/10/c3e-data-report-en-1.pdf>

¹²⁶ IUCN and UNWomen (2015). Women's Participation in Global Environmental Decision Making New research from the Environment and Gender Index (EGI). IUCN and UNWomen. Obtained at: https://portals.iucn.org/union/sites/union/files/doc/egi_factsheet_decision_making_web_sept2015.pdf

¹²⁷ C3E and IEA (2019) Status Report on Gender Equality in the Energy Sector. C3E International and the International Energy Agency (IEA). Obtained at: <https://www.globalwomennet.org/wp-content/uploads/2019/10/c3e-data-report-en-1.pdf>

¹²⁸ NASEO and EFI (2019) The 2019 U.S. Energy and Employment Report. A joint project of the National Association of State Energy Officials (NASEO) and the Energy Future Initiative (EFI). U.S. Obtained at: <https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd9228c61/t/5c7f3708fa0d6036d7120d8f/1551849054549/USEER+2019+US+Energy+Employment+Report.pdf>

¹²⁹ NASEO and EFI (2019) The 2019 U.S. Energy and Employment Report. A joint project of the National Association of State Energy Officials (NASEO) and the Energy Future Initiative (EFI). U.S. Obtained at: <https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd9228c61/t/5c7f3708fa0d6036d7120d8f/1551849054549/USEER+2019+US+Energy+Employment+Report.pdf>

¹³⁰ NASEO and EFI (2019) The 2019 U.S. Energy and Employment Report. A joint project of the National Association of State Energy Officials (NASEO) and the Energy Future Initiative (EFI). U.S. Obtained at: <https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd9228c61/t/5c7f3708fa0d6036d7120d8f/1551849054549/USEER+2019+US+Energy+Employment+Report.pdf>

Technology or sub-sector specific assessments may be in a better position to shed light on detailed occupational sex-disaggregated data and to explore the labor conditions experienced by women and men.

The Solar Foundation, a U.S. based non-governmental organization dedicated to advancing solar technologies, **in collaboration with the Solar Energy Industries Association (SEIA)**, launched the **U.S. Solar Industry Diversity Study 2019**. The report is the second study on diversity and inclusion in the solar workforce launched by the Foundation and provides data on women and people of color in the U.S. solar industry. The study is based on two separate surveys, which collected answers from 377 solar employers and 398 employees. The report found that of the more than 242,000 solar workers in the sector in 2018, women represented **26.3% of the solar workforce, while gender non-binary employees comprised 1.4%.**¹³¹

The report also highlights **different gaps between women and men, ranging from their participation in leadership positions to their career satisfaction.** When looking at leadership roles, men had higher participation to that of women, holding 37% of manager, director, or president level positions, while women filled only 28% of those roles. Men also held 80% of executive positions, while women held only 20% of those roles. Disparities were also found with regards to salary, with women

earning US\$0.78 for each US\$1 earned by men. Not surprisingly, wage satisfaction between women and men was also different, with 38% of men reporting as 'very satisfied' with this aspect, and only 28% of women reporting the same level of satisfaction. Impressions on career advancement were also measured, with 52% of men stating that they have successfully moved up the career ladder and only 37% of women identifying a similar advance in their professional lives.¹³²

The 2019 report has a chapter dedicated to understanding **the situation of women of color**, who experience both gender and ethnic barriers to join the sector. Women of color reported feeling the need to provide more evidence of their competence compared to their peers and not having the right connections to the people that make hiring decisions. Both are elements that can shape career growth in the sector.¹³³

The study was able to also compare information against the 2017 baseline provided by the first Solar Industry Diversity Study. According to the report, more solar companies are formally tracking employee diversity, increasing from 27% of companies in 2017 to 36% in 2019. Additionally, companies seem to be actively **developing gender equality strategies, with 22% of companies having established policies to increase women's participation**, in contrast with 7% in 2017.¹³⁴



¹³¹ The Solar Foundation (2019) U.S. Solar Industry Diversity Study 2019, The Solar Foundation and Solar Energy Industries Association. Obtained at: <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Industry-Diversity-Study-2019-2.pdf>

¹³² The Solar Foundation (2019) U.S. Solar Industry Diversity Study 2019, The Solar Foundation and Solar Energy Industries Association. Obtained at: <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Industry-Diversity-Study-2019-2.pdf>

¹³³ The Solar Foundation (2019) U.S. Solar Industry Diversity Study 2019, The Solar Foundation and Solar Energy Industries Association. Obtained at: <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Industry-Diversity-Study-2019-2.pdf>

¹³⁴ The Solar Foundation (2019) U.S. Solar Industry Diversity Study 2019, The Solar Foundation and Solar Energy Industries Association. Obtained at: <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Industry-Diversity-Study-2019-2.pdf>

3. Good practices for increasing women's participation and data collection in the renewable energy sector

3.1. Women's participation and improving labor conditions

3.1.1. Policies and governmental actions

Policies, whether at national or regional levels, provide an essential framework to guide institutions, companies, and civil society organizations to support women's participation in the energy sector. Where they exist, these references are mainly included in frameworks that are general to the energy sector as a whole and are less prominent in RE specific frameworks.¹³⁵ Despite this difference, it can be argued that if regulations apply to the broad energy sector, they automatically apply to activities, institutions, and actions related to renewables.

When discussing gender-responsive energy frameworks, the **Gender Mainstreaming in Energy Access**¹³⁶ Regional Policy from the **Economic Community of West African States (ECOWAS)** is perhaps the most salient example due to its reach. The policy mandates the ministries of energy of the 15 African member countries of the economic union to address gender equality in their work, covering different targets, including **increasing women's participation in energy-related technical fields and decision-making positions to 25% of the workforce by 2020 and 50% by 2030.** The policy has led to bringing capacity building processes to the national level and investing in training women as

technicians to join the energy value chain. It is also being supplemented with the ECOWAS Directive for Gender Assessment in Energy Projects,¹³⁷ which seeks to ensure that vulnerable and marginalized groups can benefit from and participate in energy infrastructure projects.

At the national level, **South Africa's Energy Policy** is perhaps the first energy policy to have addressed in its text an explicit call to increase the participation of women, particularly black women, as part of the steps needed to improve the governance of the energy sector. The policy **calls for women's participation to be increased in all policy development structures, forums, parastatal boards, and similar structures, reaching a target of 30% participation.**¹³⁸ Further, the policy includes a program to provide support and access to women-led businesses providing services to or contracting with the Department of Energy and Minerals.¹³⁹

Most recently, **Kenya approved its Gender Policy for the energy sector**, which aims at mainstreaming gender equality in the Ministry of Energy (MOE)'s institutions, policies, and programs. The policy seeks to do so by increasing the technical capacities of the institutions to mainstream gender in their work and by pursuing an increase in women's participation in the sector, among other elements. The policy calls for institutions to ensure equitable recruitment, placement, and deployment of qualified women and men and their promotion to decision making positions. It also requires institutions to promote equitable training and career development of female and male employees of government institutions, as some of the measures needed to boost women's participation in the energy sector. Additionally,

¹³⁵ From a review of 192 energy frameworks, 33 (or 17%) specifically related to renewable energy policies and objectives. Of these, only six frameworks addressed gender considerations, which equates to 18% of the renewable energy frameworks and only 3% of the total 192 frameworks assessed. Prebble, M. and Rojas, A (2017). *Energizing Equality: The importance of integrating gender equality principles in national energy policies and frameworks*. IUCN and ENERGIA. Washington, D.C. USA. Obtained from: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-energizing-equality-web.pdf>

¹³⁶ ECOWAS (2015). *ECOWAS Policy for Gender Mainstreaming in Energy Access*. Economic Community of West African States. Obtained at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/ECOWAS_Policy_for_Gender_Mainstreaming_in_Energy_Access.pdf

¹³⁷ ECOWAS (2017) *ECOWAS Directive on Gender Assessment in Energy Projects*. Economic Community of West African States. Obtained from: <http://www.ecowrex.org/document/ecowas-directive-gender-assessments-energy-projects>

¹³⁸ DoME (1998). *White Paper on the Energy Policy of the Republic of South Africa*. Department of Minerals and Energy, Government of South Africa. December, 1988. Obtained at: http://www.energy.gov.za/files/policies/whitepaper_energypolicy_1998.pdf

¹³⁹ Prebble, M. and Rojas, A. (2018). *Energizing Equality: sub-Saharan Africa's integration of gender equality in national energy policies and frameworks*. Washington, USA: IUCN, Power Africa and USAID. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-ssa-web-final.pdf>

it addresses the need to raise interest in STEM-related subjects among women and men, identifying collaboration opportunities with universities, tertiary education institutions, and development partners to obtain this engagement.¹⁴⁰

Gender equality policies also contain participation quotas or targets, in which case the national government calls on all sectors to find ways to improve women's participation in the workforce. For example, in Nicaragua, governmental institutions must comply with the country's Gender Equality Act (Law 648), which aims to achieve gender parity in the labor force for all sectors of the economy. As a result, **the National Electric Transmission Company (ENATREL) reported in 2013 that women held 50 % of its high-level decision-making positions**. Recognizing the challenge of achieving a similar result in technical and field level positions, the organization designed an institutional policy to recruit women as the first option for new vacancies in the institution.¹⁴¹

Governments in developed countries appear to prefer the provision of guided support **processes to heighten girls' and women's interest in STEM to increase the pipeline for the energy sector**. According to a 2019 report, the government of Italy, through its Department for Equal Opportunities, financially supports a STEM Summer School initiative to fight gender stereotypes in school-attending children and increase girls' interest in STEM subjects. In Austria, a Talents Program initiative provides support to young female researchers through financing internships (FEMtech Internships for Female Students) or by supporting their research on technology (FEMtech Career).¹⁴²

The U.S.'s 2014 Strategic Energy Plan directly references the "Women in Clean Energy" program as a tool to attract more women to the sector and meet future workforce needs.¹⁴³ The US-based Clean Energy, Education, and Empowerment (C3E) program is designed to implement the strategy. It is built around four pillars of action, which include an online community forum, the engagement of senior professionals as

ambassadors of the program, the recognition of female role models through a yearly award program, and the celebration of an annual symposium.¹⁴⁴

3.1.2. Commitment campaigns

Campaigns are useful tools to raise awareness and visibility of a particular topic. Several campaign efforts focus on increasing governments' and companies' commitment to enhancing women's participation in economic sectors and lifting the profile of those who commit to change. For example, the Clean Energy Ministerial (CEM) launched the **Equal by 30 Campaign** under its C3E initiative in 2018 to bring together private and public sector actors committed to equal pay, equal leadership, and equal opportunities by 2030.¹⁴⁵ Nine countries (Canada, Italy, Sweden, Finland, UK, U.S., Japan, Germany, France) and more than 80 energy companies have joined the campaign.¹⁴⁶ The campaign asks governments and companies to endorse high-level gender equality principles and subsequently commit to taking concrete actions to close gender gaps and increase women's participation in the RE sector.¹⁴⁷

While assessing the status of women in the energy sector, C3E found **that those who had signed up to the campaign had higher average rates in terms of women's participation on three key indicators than those who had not made public pledges**. The following indicators show the comparison between the 18 signatory companies and the 160 companies assessed overall. On the total number of employees, signatory companies had a 33% women's participation compared with an overall average of 23%. On the percentage of women on the board of directors, 31% of positions were held by women in signatory companies compared with 20% overall. On women in management positions, 28% of posts were held by women in signatory companies compared with 18% overall.¹⁴⁸

Canada serves as an example of how international campaigns can be implemented at the national level. Engineers Canada supports the implementation of the Equal by 30 Campaign and has a target that **30% of newly licensed engineers should be women by**

¹⁴⁰ MoE (2019). Gender Policy. Ministry of Energy. Government of Kenya. Obtained from: <https://energy.go.ke/wp-content/uploads/2019/10/Gender-Policy-in-Energy.pdf>

¹⁴¹ Rojas, A.V., Siles, J. (2014). Guía sobre Género y Energía para Capacitadoras(es) y Gestoras(es) de Políticas Públicas y Proyectos. ENERGIA, OLADE and IUCN. At: <https://portals.iucn.org/library/sites/library/files/documents/2014-061.pdf>

¹⁴² DoE (2014). Strategic Plan 2014-2018. U.S. Department of Energy. U.S. Obtained from: https://www.energy.gov/sites/prod/files/2014/04/f14/2014_dept_energy_strategic_plan.pdf

¹⁴³ Prebble, M. and Rojas, A. (2017). The enabling power of energy in promoting gender equality: Gender in the SEforALL country action process documents. IUCN and USAID. Washington D.C., U.S. November 2017 version. Obtained at: https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-seforall-web_0.pdf

¹⁴⁴ C3E program, USA chapter. Website at: <https://www.c3eawards.org/about>

¹⁴⁵ Equal by 30: Gender Equality in the Clean Energy Sector. Website: <http://www.cleanenergyministerial.org/campaign-clean-energy-ministerial/equal-30>

¹⁴⁶ C3E and IEA (2019) Status Report on Gender Equality in the Energy Sector. C3E International and the International Energy Agency (IEA). Obtained at: <https://www.globalwomennet.org/wp-content/uploads/2019/10/c3e-data-report-en-1.pdf>

¹⁴⁷ Equal by 30: Gender Equality in the Clean Energy Sector. Website: <http://www.cleanenergyministerial.org/campaign-clean-energy-ministerial/equal-30>

¹⁴⁸ C3E and IEA (2019) Status Report on Gender Equality in the Energy Sector. C3E International and the International Energy Agency (IEA). Obtained at: <https://www.globalwomennet.org/wp-content/uploads/2019/10/c3e-data-report-en-1.pdf>

2030.¹⁴⁹ Through Engendering Success in STEM (ESS),¹⁵⁰ a seven-year research program, Engineers Canada and its associates seek to identify organizational practices that can predict and support a gender-responsive working environment. In addition, Engineers Canada facilitates the 30 by 30 Champions network, the collection of data on women's participation in engineering, the distribution of this information, and the implementation of advocacy strategies on women in engineering aimed at the Canadian federal government.¹⁵¹ All initiatives are designed to achieve the 30% participation rate in engineering by 2030.

Also in Canada, an initiative named the **Leadership Accord on Gender Diversity**¹⁵² brings employers, educators, unions, and governments together to promote diversity and inclusion in their energy sector organizations. The Accord was launched in 2017, as a partnership between Electricity Human Resources Canada and Women Leadership Nation (WLN)¹⁵³, to sustain efforts for achieving systematic change in women's participation in the energy sector. The Accord allows organizations who publicly commit to gender equality to receive support to overcome the barriers they face to increasing women's participation. WLN provides the support process in a tailored manner. It published a short document capturing success stories in 2019 to showcase experiences of accord signatories.¹⁵⁴

Finally, UNWomen, in collaboration with the UN Global Compact, has adapted the **Calvert Women's Empowerment Principles**¹⁵⁵ to empower women in the workplace and community. The principles are (i) establishing high-level corporate leadership for gender equality; (ii) treating all women and men fairly at work (non-discrimination); (iii) ensuring the health, safety, and well-being of all women and men employees; (iv) promoting education, training and professional development for women; (v) implementing enterprise development, supply chain, and marketing principles that empower women; (vi) promoting equality through community initiatives and advocacy, and; (vii) measuring

and publicly reporting on progress to achieve gender equality.¹⁵⁶ The principles emphasize the business case for companies to promote gender equality and women's empowerment and provide guidance for their implementation. If endorsed and applied by companies in the RE sub-sector, these principles can contribute to modifying participation rates of women in the RE sub-sector.

3.1.3. Companies and support programs

Energy companies are addressing gender equality internally, either to comply with national gender equality policies or to benefit from the guidance provided by gender equality certification procedures or similar support opportunities. In this sense, **national gender equality certification processes** can have a positive influence on supporting energy companies' gender equality efforts. For example, Itaipu Binacional, a bi-national hydroelectric company operating in Brazil and Paraguay, has followed a gender equality and diversity certification process according to the national regulations of Brazil.¹⁵⁷ As a result, it has introduced policies such as implementing flexible hours, extending maternity leave to up to six months, recognizing family leave for female and male employees to tend to sick family members, establishing a daycare facility for employees' children, and using inclusive language in recruitment.¹⁵⁸

There are also tools available to support companies, and specifically energy utilities, to **review their human resource policies through a gender lens**. One of these initiatives is Engendering Utilities, a U.S. Government program developed to support energy utilities to improve their employee life cycle. The program provides direct technical support to interested utilities and, based on its practical experience, has developed a best practice framework for implementing gender equality practices through the employee life cycle.¹⁵⁹

¹⁴⁹ Engineers Canada. 30 by 30 website: <https://engineerscanada.ca/diversity/women-in-engineering/30-by-30>

¹⁵⁰ Engendering Success in STEM website: <http://successinstem.ca/>

¹⁵¹ Engineers Canada. 30 by 30 website: <https://engineerscanada.ca/diversity/women-in-engineering/30-by-30>

¹⁵² Leadership Accord on Gender Diversity website: <https://electricityhr.ca/workplace/diversity/accord/>

¹⁵³ Women Leadership Nation website at: <https://womenleadershipnation.com/>

¹⁵⁴ EHRC (2019). Advancing Gender Diversity in Canada's Electricity Sector: A Compendium of Success Stories. Energy Human Resources Canada. Obtained at: <https://electricityhr.ca/wp-content/uploads/2019/11/Accord-Compendium-FINAL-WEB.pdf>

¹⁵⁵ UNWomen and UN Compact Office (2011). Women's Empowerment Principles: Equality Means Business. A Partnership Initiative of UN Women and the UN Global Compact Office. Obtained at: https://www.unglobalcompact.org/docs/issues_doc/human_rights/Resources/WEP_EMB_Booklet.pdf

¹⁵⁶ UNWomen Empowerment Principles: <https://www.unglobalcompact.org/take-action/action/womens-principles>

¹⁵⁷ Gender equality certification processes have been constructed at national level with the support of UNWomen. In addition, UNWomen has developed the Women Empowerment Principles, which can be endorsed by companies interested in advancing the gender equality agenda. More on the Women Empowerment Principles can be found here: <https://www.unglobalcompact.org/take-action/action/womens-principles>

¹⁵⁸ Guarezi, M.H. (2012). Equidad de Genero en la ITAIPU Binacional. Primer Foro Regional de Empresas por la Igualdad. August 28th-29th 2012. Mexico City. Mexico.

¹⁵⁹ Tetra Tech Inc. (2019). Delivering Gender Equality: A best practices framework. Engendering Utilities. For USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment in Washington, DC. Obtained at: <https://www.usaid.gov/sites/default/files/documents/1865/Delivering-Gender-Equality-A-Best-Practices-Framework-for-Utilities.pdf>

Companies can engage in different strategies to improve their human resource policies, for example, by reviewing their **recruitment practices** to ensure that they target women. This strategy may be particularly important if one wants to increase the number of women in STEM-related positions within the company, as their numbers are already low. The development of internships for STEM and non-STEM fields is one strategy to engage young women in energy companies.¹⁶⁰ Umeme, a Ugandan energy utility, has another approach of establishing a campus-recruitment program to hire female engineers. As a result, a third of their 25 new annual recruits are women. The Liberia Electricity Corporation (LEC) has a positive discrimination approach to hiring for new positions. When women and men are similarly qualified for a job, the company will exercise a preference for hiring the female candidate.¹⁶¹

To comply with the government's requirement to correct gender and racial imbalances in **South Africa, Eskom's recruitment policy** stipulates that a certain number of persons to be interviewed for a new position need to be women and that at least one woman needs to sit on the interview panel. Furthermore, for a team to present a project to higher management, the team has to have at least one female member. **Affirmative action** is also present in skills development processes, with Eskom intentionally recruiting 50% women and 50% men for their formal training program for welders.¹⁶²

Ensuring women's and men's **safety** on the job is essential. Measures include putting safety protocols in place and providing equipment such as helmets, boots, and gloves to meet the needs of both women and men, which may require companies to ensure a broader range of equipment sizes are available to their employees.¹⁶³ Suitable clothing may also include maternity clothes

and clothes following cultural and religious norms. On this theme, the Kano Electricity Distribution Company Plc (KEDCO) in Nigeria allows women to dress in accordance with their culture and religion, to ensure both the women and their families feel comfortable when they interact in public.¹⁶⁴

Moreover, companies need to provide equal access to separate toilets, changing rooms, showers, and other facilities appropriate for women and men to guarantee their personal safety and hygiene. Women also require equal access to field safety training and need to benefit equally from field safety protocols such as live-line protocols and tag-out procedures.¹⁶⁵ **Safety protocols should also take risks for women to travel alone during field visits into account and should ensure that they can have their own sleeping quarters when deployed to the field.** For example, Eskom provides women working in the field with separate changing facilities and requires that there always be multiple people traveling in the same vehicle to avoid leaving women in isolation or vulnerable situations.¹⁶⁶

Enforcing and strengthening **sexual harassment policies** is vital to contribute to women's safety within all companies, including those in the RE sector. In the implementation of these policies, it is good practice to ensure that all employees, including new recruits, receive training on the content and reach of the policies, as well as the mechanisms for putting forward complaints.¹⁶⁷ Companies can also provide counsel to women and men suffering from domestic violence. Umeme provides on-site counselors for employees suffering from abuse.¹⁶⁸ Meanwhile, Itaipu Binacional supports programs to combat domestic violence in the locality where it is established.¹⁶⁹

¹⁶⁰ Engility Corporation (2016) Engendering Utilities: Improving gender diversity in power sector utilities. Developed for USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment. Washington, DC. January 2016 Obtained from: https://unfccc.int/files/gender_and_climate_change/application/pdf/engendering_utilities.pdf

¹⁶¹ Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁶² Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁶³ Tetra Tech Inc. (2019). Delivering Gender Equality: A best practices framework. Engendering Utilities. For USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment in Washington, DC. Obtained at: <https://www.usaid.gov/sites/default/files/documents/1865/Delivering-Gender-Equality-A-Best-Practices-Framework-for-Utilities.pdf>

¹⁶⁴ Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁶⁵ Tetra Tech Inc. (2019). Delivering Gender Equality: A best practices framework. Engendering Utilities. For USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment in Washington, DC. Obtained at: <https://www.usaid.gov/sites/default/files/documents/1865/Delivering-Gender-Equality-A-Best-Practices-Framework-for-Utilities.pdf> For more on gender considerations and occupational safety, you can refer to ILO (2013) 10 Keys for Gender Sensitive OSH Practice –Guidelines for Gender Mainstreaming in Occupational Safety and Health. ILO and SIDA. Geneva, Switzerland. Obtained at: <https://drive.google.com/file/d/1dgFB9aW6AlQO8jrWsTsVuBrSyUZF6uPX/view>

¹⁶⁶ Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁶⁷ Tetra Tech Inc. (2019). Delivering Gender Equality: A best practices framework. Engendering Utilities. For USAID's Office of Energy and Infrastructure, Energy Division within the Bureau of Economic Growth, Education and Environment in Washington, DC. Obtained at: <https://www.usaid.gov/sites/default/files/documents/1865/Delivering-Gender-Equality-A-Best-Practices-Framework-for-Utilities.pdf>

¹⁶⁸ Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁶⁹ Rojas, A. and Siles, J. (2015) Guide on Gender and Energy for Trainers and Managers on Public Policies and Projects. ENERGIA, OLADE and IUCN. Obtained from: <http://biblioteca.olade.org/opac-tmpl/Documentos/old0370.pdf>

Addressing gender equality in human resource policies also means recognizing the need to maintain a **good work-life balance**. These measures can include introducing flexible working hours, rotating responsibilities for undertaking fieldwork, and ensuring that women and men can take **parental leave** to care for ill family members or paying sufficient wages for employees to afford caregiving services.¹⁷⁰ Energy companies show a range of approaches in this sense. For example, LaGeo, a geothermal power plant in El Salvador, **provides day-care facilities** for children under four years of age.¹⁷¹ Companies such as Itaipu Binacional offer childcare centers for employees and make parental leave available to their female and male employees.

Furthermore, companies can support women's entry into the workforce by acknowledging and extending their maternity leave beyond the national norm. Itaipu Binacional provides up to six months of **maternity leave**, and Eskom provides 150 days of paid maternity leave, with an additional 30 days at 30% salary. Eskom also provides leave benefits to women who have suffered miscarriages.¹⁷²

Finally, companies can also review their human resource policies to ensure that women have equal access to **training and skill development opportunities**. For example, the Ethiopian Electricity Utility (EEU) is providing STEM education and training for its female employees to further their careers. KEDCO has acknowledged a preference for investing in skill development of women employees.¹⁷³ In the case of LaGeo, local women are trained on par with men, to conduct seasonal maintenance of the geothermal plant.¹⁷⁴ Companies can also follow the examples of Ibadan Electricity Distribution Company (IBEDC) and

Umeme by hosting mentorship programs to ensure that women receive on-the-job support.¹⁷⁵ In South Africa, Globeleq is an independent power producer seeking to increase women's participation in the RE value chain, for which it dedicates up to 40% of its socio-economic development allocation on skills development.¹⁷⁶

In Costa Rica, the national utility, Instituto Nacional de Electricidad (ICE), focused on skills recruitment to bring in 90 local women to join the construction crew of the Reventazon dam. To increase their retention rate, ICE **combated gender stereotyping by establishing sensitization programs for all staff and assigned women to perform tasks based on their capacities** –i.e., motor skills, attention to detail, or leadership skills.¹⁷⁷

Companies and associations are also making efforts to **increase girls' interest in STEM**. For example, energy utilities are organizing outreach opportunities to expose girls to their work. One such company is EkoElectricity Distribution Company's (EKEDP), which holds a Bring Your Daughter to Work Day, to encourage Nigerian girls to join STEM fields and promote interest in the many job opportunities in the energy sector.¹⁷⁸ In the same vein, the Ibadan Electricity Distribution Company of Nigeria organizes "energy clubs" at secondary schools for girls between the ages of 9-13, increase understanding of the sector, including how to practice safety in electricity handling and advocate for energy efficiency.¹⁷⁹ Others, such as Taungana, a social movement in South Africa, Zambia, and Zimbabwe, work closely with high-school girls in rural areas to provide them with practical experiences, education, and career options in STEM and entrepreneurship.¹⁸⁰

¹⁷⁰ IUCN and USAID (2018b). Advancing Gender in the Environment: Making the Case for Women in the Energy Sector. AGENT Thematic Energy Brief Series. Washington DC, U.S. Obtained at: <https://genderandenvironment.org/resource/making-the-case-for-women-in-the-energy-sector/>

¹⁷¹ Gonzales, A. et al (2019) Gender Responsive Geothermal Generation: Powering energy and social benefits in El Salvador. Advancing Gender in the Environment. IUCN and USAID. Washington D.C., U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-usaid-lageo-brief-accessible-spreads.pdf>

¹⁷² Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

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¹⁷⁵ Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁷⁶ Parshotam, A. and van der Westhuizen, H. (2018). Women and the Energy Value Chain: Opportunities for a more inclusive renewable energy sector in Africa. Discussion Paper. October 2018. Global Economic Governance Africa (GEGAfrica).

¹⁷⁷ IUCN and USAID (2018a). Advancing Gender in the Environment: Making the Case for Gender Equality in Large-Scale Renewable Energy Infrastructure Development. AGENT Thematic Energy Brief Series. Washington DC, U.S. Obtained at: https://www.usaid.gov/sites/default/files/documents/1865/IUCN-USAID-Making_the_case_for_INFRASTRUCTURE.pdf

¹⁷⁸ IUCN and USAID (2018b). Advancing Gender in the Environment: Making the Case for Women in the Energy Sector. AGENT Thematic Energy Brief Series. Washington DC, U.S. Obtained at: <https://genderandenvironment.org/resource/making-the-case-for-women-in-the-energy-sector/>

¹⁷⁹ Prebble, M. and Rojas, A (2019). Energizing Equality: Unlocking the potential of women's participation in sub-Saharan Africa energy utilities. IUCN, Power Africa and USAID. Washington DC, U.S. Obtained at: <https://portals.iucn.org/union/sites/union/files/doc/iucn-egi-utilities-brief-web-final.pdf>

¹⁸⁰ Terera, S. (2017). Building a Diverse Future: Increasing girls' interest in STEM. Presentation at Increasing Girls' and Young Women's Interest in STEM and the Energy Sector. AGENT Webinar Series. Obtained at: <https://genderandenvironment.org/resource/gecco-webinar-increasing-girls-young-womens-interest-stem-energy-sector/>

3.1.4. Women's associations

Many of the efforts targeted at increasing women's participation in the RE sector are channeled through **networking** opportunities organized by women already working in the sector. Their strategies focus on improving retention rates of women in the sector, by providing support to these women. In this regard, networks such as the Global Women's Network for the Energy Transition (GWNET)¹⁸¹ and WIRE¹⁸² support mentoring opportunities for their members. Women in Sustainable, Environment and Renewable Energy (WISER)¹⁸³ encourages women to join the RE sector by facilitating open forums for exchange and by establishing an internship program for women to gain experience in the solar sector.

Other networks such as Women in African Power (WiAP)¹⁸⁴ reach out to women working in the energy sector as a whole – from generation to transmission and distribution, and financing of energy projects. WiAP fosters information exchanges and mentoring programs to strengthen the capacity and visibility of women in the energy sector and profiles its members in international energy fora to expand the pool of female expert speakers in the energy sector.

Finally, there is an increase in the **number of women associations in the energy sector working at the national level**.¹⁸⁵ These can be a national chapter of international networks, such as GWNET or WiAP, or independently created networks such as REDMEREE in Mexico and WIRE in Rwanda, mentioned earlier. These networks also engage in information sharing and career development activities. For example, the South African Wind Energy Association has implemented a mentorship program for women working in the sector to make commitments towards supporting women-led enterprises in the RE sub-sector.¹⁸⁶ In the U.S., Women of Renewable Industries and Sustainable Energy (WRISE)¹⁸⁷ supports its members by facilitating leadership programs and peer-to-peer support groups, where women can share their experiences and learn from each other. WRISE engages in sensitization processes with RE companies and produces a series of webinars to support women working in the RE sub-sector and companies to address gender considerations in their work.

3.2. Data collection on women's participation in the renewable energy sector

Given the challenges previously identified and the lack of centralized information relevant to understand the sex-disaggregated composition of the RE sector, it is likely that efforts to close this gap will continue to rely on **primary data collection by interested parties**. Data-collection processes engaging directly with RE companies can learn from some of the previous efforts discussed here.

In this regard, any data collection process needs to acknowledge that the information requested is sensitive for the companies approached. Hence, **trust-building processes may be required** that incorporate sensitization workshops on the importance of increasing women's participation in the RE sector, paired with information on how companies can directly benefit from sharing information such as by identifying gender gaps or supporting remedial actions.

This outreach and trust-building efforts can be followed up with specific **surveys for the human resource department**, to identify the number of women and men working in the companies, taking into account their seniority and type of jobs realized, from heads of companies to technicians, interns, etc. Surveys can also request information such as the number of new hires, employees who have left, promotions, employees in training, or people working in decision-making committees to provide a view of the company's growth and retention rates. Direct **interviews with human resources managers** can supplement the surveys. As salary scales are particularly sensitive company information, it may not always be possible to receive such information upfront. These questions could be brought up in a second round of interventions when there is more trust among parties.

If the companies allow, further surveys can be done with company employees to pinpoint their impressions with regards to topics such as access to equal payment,

¹⁸¹ Global Women's Network for the Energy Transition (GWNET) can be found here: <https://www.globalwomennet.org/>

¹⁸² WIRE can be found here: <https://www.insidephilanthropy.com/girls-women-grants-funding/2016/3/24/whats-the-clinton-foundation-doing-at-the-nexus-of-climate-i.html>

¹⁸³ WISER can be found here: <https://masdar.ae/en/strategic-platforms/wiser>

¹⁸⁴ Women in African Power (WiAP) Network can be found on LinkedIn here: <https://www.linkedin.com/groups/8364405/>

¹⁸⁵ Personal communication with Davina Ngei, Communications Manager, Global Women's Network for the Energy Transition (GWNET). January, 28th, 2020.

¹⁸⁶ Parshotam, A. and van der Westhuizen, H. (2018). Women and the Energy Value Chain: Opportunities for a more inclusive renewable energy sector in Africa. Discussion Paper. October 2018. Global Economic Governance Africa (GEGAfrica).

¹⁸⁷ WRISE website at: <http://wrisenergy.org/>

career opportunities, skills development, sexual harassment, amongst others. **Anonymous surveys** may provide the best results when asking employees about their perception of women's situation in the company and may identify issues of inclusion and belonging within the company. Participatory processes can follow the surveys, with facilitated dialogues between employees.

Focus groups can also be useful in settings outside of the companies, to capture additional and relevant information. For example, engaging with TVET and STEM students and professors may help to identify the barriers women face in pursuing studies relevant to the RE sub-sector and identify better ways to connect trainees with the existing labor opportunities.

Concerning the strengthening of government-led data collection processes, the role of **socio-economic surveys** should not be underestimated when it comes to clarifying the participation of women in different sectors. As described earlier, the INEGI in Mexico collects sex-disaggregated data by economic sectors allowing for the calculation of participation in the industrial sector and the energy sub-sector. The new round of socio-economic surveys under development in 2020 are expected to include further disaggregation within the economic sectors, for example, by energy technology, and position in the value chain.¹⁸⁸ If this is the case, that will allow the INEGI to centrally estimate the number of women and

men directly working in the RE sector in Mexico, serving as a baseline for monitoring women's and men's participation in the RE sector for the coming years.

National governments also have the opportunity to strengthen their **gender machineries, or formal structures to drive gender equality**, to support the collection of data on women's economic participation in the RE sub-sector. In the case of Rwanda, the Ministry of Gender and Family already has an office tasked with monitoring women's participation in the labor market. Therefore, the GMO is well positioned to engage in direct conversations with the different energy companies in Rwanda and request at least the information related to the number of women they employ, and the type of activities in which they engage.

For other governments that have implemented **gender equality seals or certifications** implemented, for example, Mexico and Brazil, it would be possible to use the information collected through these processes to monitor women's participation in and equal treatment by RE companies. However, it must be acknowledged that certifications are a voluntary process and that such initiatives may not necessarily cover all RE companies unless certificates are a prerequisite for a permit request or the implementation of an energy project.



¹⁸⁸ Personal communication with Perla Salinas, Consultant for Cluster Energia Coahuila. October 7th, 2019.

4. Conclusions and Recommendations

NDCs are essential instruments to ensure a just energy transition. Their importance lies not only in ensuring the decarbonization of the sector but also in the possibility of creating decent jobs in the transition. New markets also provide **opportunities to reduce existing gender gaps in labor market participation**, which in turn can generate a variety of co-benefits. Co-benefits range from increased income and economic empowerment of women to a healthier family economy and a better and more secure future for the children of women and men joining the RE sector. The NDC's five-year review cycle allows countries to enhance and strengthen the ambition of their NDCs, both in terms of climate actions and participation targets. With countries presenting their first revised NDCs in 2020, this year will mark an important milestone to assess whether previous generic mentions of gender equality have translated into concrete national activities or targets, including those to increase women's participation in the RE sector.

Mapping and monitoring women's participation in the sector requires the collection of sex-disaggregated information, both in terms of participation numbers and in qualitative terms. The latter is needed to understand whether or to what extent these new labor opportunities are indeed appropriate and if they comply with non-discriminatory rules and regulations. This data can serve as a baseline for reporting on governments' different international and national commitments, both in terms of achieving the SDGs on climate change and RE, and the gender equality commitments. When paired with efforts to model future job opportunities and calculate co-benefits, the data can serve as a tool to inform the public at large about the multiple benefits that a move to an RE-based economy can achieve. Linking these efforts with national communications, reporting, and enhancement of NDC implementation targets may be a way to improve the systematic collection of sex-disaggregated data on labor participation in the RE sector at the national level.

Policymakers already possess a series of tools to collect information at the national level and generate a centralized data center to house information on women's participation in the RE sector. In this regard, **national statistics offices** can rely on existing socio-economic surveys to capture this data. National surveys may need to be modified to ensure that data can be disaggregated not only by sex but also by generation technology within the energy sector at large. When transferring survey data into main national systems, it is also necessary to ensure that primary data can be accessed to generate specific data sets for the RE sector (solar, wind,

geothermal, etc.) and in different segments of its value chain (transmission, distribution, manufacturing of technologies, etc.).

However, economic surveys may not be sufficient to capture data on perceptions of the labor environment. In this regard, additional data-collection efforts, including **conducting sector-specific surveys, may prove a more cost-efficient** manner for tracking women's participation in a nascent sector, such as RE.

In addition, **ministries of women affairs** can leverage their mandates and existing departments to gather primary data on women's participation in the sector. These ministries, in collaboration with entities in charge of RE at the national level, have the ability to initiate their data collection efforts at any time, in contrast with national economic surveys, which are planned at longer and fixed intervals. These entities could engage in conversations with public and private RE companies and explain the importance of understanding their labor composition as part of national commitments to achieve gender equality. These information requests could be made annually, providing the advantages of constant monitoring of data and strengthening collaboration with the RE companies. National reports could also provide a platform for leading companies to profile themselves as good employers and to showcase best practices for increasing women's participation in the economy at large.

Organizations seeking to map women's participation in the RE sector should dedicate time and resources to collecting primary data. If no mapping or data collection processes are happening in parallel, then they need to develop an engagement process with the RE companies. The process should build trust with these companies through information exchange and the clarification of benefits to companies as a result of disclosure. Moreover, it may be necessary to utilize a combination of tools, from surveys to focus groups, to ensure the accuracy and relevance of the information gathered.

When considering future job opportunities in the RE sector, it is also important to understand the existing pipeline of candidates and future trends. In this sense, understanding the reasons that girls and boys study STEM-related subjects and the potential job opportunities in the sector is useful. Hence, strong collaboration with the **ministries of education** to document these trends is needed. Report findings on this theme can inform new curriculum development at the school level and help to reduce the negative impacts of social stereotyping on girls' interest in STEM.

RE companies and women's networks have an important role to play in terms of **strengthening collaboration with TVET institutes and universities**. These entities can both showcase female role models and feature job opportunities through exposure visits or the facilitation of internships and the communication of job opportunities. Companies seeking to increase the participation of women in their labor force can rely on these collaborations to increase their pool of candidates. Companies can also tap into existing initiatives and knowledge to revise and adapt their **human resources policies** to ensure a more gender-responsive work environment that suits their context.

The following actions are recommended for policymakers and other key stakeholders interested in increasing women's participation in the RE sub-sector and tracking progress:

Policymakers and government institutions:

- Align the NDC targets and identification of co-benefits with gender equality and women's empowerment targets captured in national policies and international commitments, including those related to the RE sub-sector. In the absence of such targets, countries can use the NDC review cycles to initiate national-level policy processes to ensure that women benefit from the energy transition, including through increased access to labor opportunities.
- Design sex-disaggregated data collection and gender-responsive participatory processes that capture participation rates and labor conditions in the RE sector and align them with NDC review and reporting processes.
- Build on existing gender equality mandates to review national data-collection tools to explore the disaggregation of industrial classifications used in national socio-economic surveys and to capture participation in the RE sub-sector in a sex-disaggregated manner. This work should be done in collaboration with statistics departments, and ministries of energy and women's affairs.
- Require developers to demonstrate gender equality commitments when providing and renewing permits for companies working in the RE sub-sector and to report on their labor composition in a role distribution and sex-disaggregated manner.
- Develop an RE sub-sector specific system for conducting targeted surveys to track the participation of women and men, including identification of the entity or entities in charge of the survey development, the survey frequency, the boundaries of the survey, the inclusion of quantitative and qualitative data to assess labor segregation and equal treatment of women and men in the sector, and the

publication of the findings.

- Develop a plan to reduce gender biases in STEM education and raise girls', boys', young women's, and men's interest in these subjects to prevent future skill gaps that may affect participation in the RE sub-sector. This planning should be done in collaboration with the ministries of education, universities, TVET institutions, and other relevant experts

RE companies:

- Review employee databases to ensure that information on positions, years of seniority, etc., is captured in a sex-disaggregated manner.
- Review human resources policies to ensure that they address the needs of women and men in their labor force, and to eliminate any type of unintended bias towards women, including through recruitment or promotion practices.
- Engage women and men in sensitization processes on the need to improve gender equality in the company and to combat sexual harassment and discriminatory practices.
- Establish training and re-training programs that specifically target women, to increase their opportunities to join or grow within the company.
- Encourage coaching and mentoring processes within the company to support women and men in their career development.
- Develop collaboration processes with universities, TVET institutions, and local education centers including schools to increase the girls', boys', young women's, and men's interest in STEM and RE related study subjects.
- Team up with gender experts or specialized networks to further support spaces for women's participation in the RE sector.

Key stakeholders in the RE sub-sector:

- Develop a survey-based data collection process in the absence of readily available data on the labor composition in the RE sub-sector. The process design should take into account the need to invest time and human resources in trust-building with companies and the educational institutions (universities, TVET institutes, etc.) surveyed.
- Promote networking opportunities for women working in the RE sub-sector, creating spaces for information and experience sharing and identifying role models who can inspire women to join and remain in the sector.
- Develop educational exchanges where women working in RE can share their experiences and inspire girls and boys, and young women and men to join the sub-sector.



5. Resources

5.1. Documents and articles

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5.2. On-line interviews and personal communications

Ana Perez, Senior Gender Technical Advisor on the Learning, Energy, and Environment for Development, RTI's International Development Group. November 11th, 2019.

Davina Ngei, Communications Manager, Global Women's Network for the Energy Transition (GWNET). January, 28th, 2020.

Emmnaule Ganza, Consultant, GGGI Rwanda. November 11th, 2019.

Kristen Graf, Executive Director, Women of Renewable Industries and Sustainable Energy (WRISE). January 24th, 2020.

Laura Blanco, PhD., Lecturer, School of Economics, Universidad de Costa Rica. January 13th, 2020.

Perla Salinas, Consultant for Cluster Energia Coahuila. October 7th, 2019.

Sandra Caballero, Coordinator General, Red Mujeres en Energia Renovable y Eficiencia Energetica (REDMEREE) and Gender, Environmental & Social Expert, GGGI Mexico. January 24th, 2020.

5.3. Websites

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Engendering Success in STEM website: <http://successinstem.ca/>

Engineers Canada. 30 by 30 website: <https://engineerscanada.ca/diversity/women-in-engineering/30-by-30>

Global Women's Network for the Energy Transition (GWNET) can be found here: <https://www.globalwomennet.org/>

GMO can be found here: <http://www.gmo.gov.rw/index.php?id=560>

Leadership Accord on Gender Diversity can be found here: <https://electricityhr.ca/workplace/diversity/accord/>

REDMEREE can be found on LinkedIn here: <https://www.linkedin.com/company/redmerree-red-de-mujeres-en-energ%C3%ADa-renovable-y-eficiencia-energ%C3%A9tica/> or on Facebook here: <https://www.facebook.com/redmujeresenenergia/>

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Women in African Power (WiAP) Network can be found on LinkedIn here: <https://www.linkedin.com/groups/8364405/>

Women Leadership Nation website at: <https://womenleadershipnation.com/>

Women of Renewable Industries and Sustainable Energy (WRISE) can be found here: <http://wrisenergy.org/>

UNWomen's Women Empowerment Principles can be found here: <https://www.unglobalcompact.org/take-action/action/womens-principles>



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