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ORIGINAL RESEARCH ARTICLE

Mapping the gender transformations for sustainable energy sector organizations in Ghana

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ABSTRACT

Energy organizations are undergoing gender transformations due to globalization, environmental changes, and sustainability. The Ghanaian energy organizations are dominated by male and masculine cultures. Women are few in the sector and active in the lower-paid, non-technical fields. Due to their minority status, collective frustration with expectations and aspirations motivated gender transformations in the energy sector of Ghana. Deploying a multiple case study design coupled with a qualitative approach, the paper found collective effort in promoting women in the energy sector of Ghana. A regime of expert platforms made up of 'sisters in energy solidarity' was also found, adopting gender strategic measures such as networking, mentorship, coaching programme, advocacy, and gender equity-driven energy initiatives aimed at re-engineering a shift in gender dynamics in the energy jobs of Ghana. This gender transformative regime among the energy work organizations implies inclusivity, diversity, alleviating women's energy poverty, and a move towards achieving modern organizational status among the energy organizations in Ghana.

Keywords: gender transformations; gender equity-driven energy initiatives; sisters in energy solidarity; mentorship; women-energy poverty; energy organizations; Ghana

1. Introduction

Writing from gender, technology, and sustainable development perspectives, this study examines gender transformations for sustainable development within energy organizations in Ghana. Transformations that are occasioning sustainable shifts in gender dynamics are leading to more women in collective, breaking barriers and crossing bridges to take up jobs in Ghanaian energy organizations. Similarly, the energy sector is historically gendered, featuring male preponderance and masculinity discernment[1,2].

Globally, small numbers of women enter the energy sector; many leave because of gender biases, lack of adequate training and opportunities, inadequate policies to attract or retain women, workplace inflexibility, and unequal pay[3]. A report compiled in 2022 found that women represent 32% of full-time employees in the renewable energy sector, compared to 22% in the conventional oil and gas business[4]. The study also showed that jobs held by women are higher for general administrative jobs (43%), but lower for jobs that require science, technology, engineering, and mathematics (STEM) training (31%)[4]. The study further identifies barriers preventing women from entering jobs in the renewable energy sector, including cultural and social

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norms, unequal asset ownership, a lack of skills, and a lack of gender-specific training. Invariably, only 40% of men are aware of these barriers, compared to 75% of women.

Over the years, the energy sector of Ghana has been plagued by challenges both in the day-to-day management and strategic direction of the sector, contributing to inefficiencies in the distribution of power and inconsistent policy direction[5]. Tackling these operational and strategic challenges requires an inclusive approach to decision-making on policy, operational, and strategic issues[5]. An inclusive approach would solicit and place equal value on the perspectives, interests, and experiences of male and female professionals in decision-making processes. The energy sector in Ghana is male-dominated, severely constraining the numbers of women that may participate and rise to the management and executive levels, where they may contribute to operational, policy, and strategic decision-making[5].

Also, organizations in Ghana's energy sector present a high level of inequality in the numbers, contributions, and influence of women[5]. With this inequality, the sector is denied the benefit of the perspectives, experience, knowledge, and interests of women in the policy, operational, and strategic decision-making processes that determine the efficiency and effectiveness of power generation, distribution, and financing in Ghana. Without the equal participation of women in decision-making in the sector, the inefficiencies in power distribution in the country have become eminent, and the inconsistencies in policy direction and weaknesses in strategic direction may never be comprehensively and sustainably resolved[5].

Ghana's storyline is problematic and generates research interest on the grounds of literature and knowledge gaps. Certainly, extant literature and empirical studies do exist on energy, technology, and organizational gender perspectives, especially on women in energy, but the geographical base of such works is different. Studies on Africa are woefully scarce, and Ghanaian studies are very few. The current study therefore fills an important gap, contributing to pushing the boundaries of knowledge for women in energy studies further.

Contextually, the Government of Ghana (GoG) entered into an agreement with the Millennium Challenge Corporation (MCC) in 2014 to provide reliable and affordable power to businesses and households in Ghana. The agreement dubbed 'Ghana Power Compact' aimed at achieving its goal by transforming the power sector through private sector participation and key policy and institutional reforms. The Millennium Development Agency was established to oversee, manage, and implement the programs set out in the agreement between the Government of Ghana and Millennium Challenge Corporation. One of the measures by which the Ghana Power Compact seeks to bring transformation to the energy sector is by increasing women's participation in decision-making in the sector. In this regard, the Millennium Development Agency in 2017 set up a gender unit in the Electricity Company of Ghana (ECG), comprising a physical structure, gender focal persons, a gender manager, and resources, and later introduced the Gender Audit, Gender Policy, and Institutional Strengthening Program to support and encourage all public and private energy organizations in Ghana to make policy and institutional changes that would foster increased participation of women in the sector. It is against this backdrop that the following research questions are asked:

i. What are the motivating factors for pursuing gender transformation among women energy workers?
ii. How are women in energy contributing to the gender transformations in the industry?

2. Ghanaian energy sector organizations

In this section, energy organizations within the Ghanaian context are referred to as power suppliers in terms of policy formulations, regulatory frameworks, generation, transmission, and distribution of power. The ministry of energy is headed by a sector minister and directly reports to the president of Ghana. The position

is politically appointed and approved by the Parliament of Ghana. The ministry of energy, in collaboration with relevant agencies and departments such as the Energy Commission, develops and ensures reliable, high-quality energy services at the minimum cost to all sectors of the economy through the formulation, implementation, monitoring, and evaluation of energy sector policies[6].

The goal of the energy ministry is to make energy services readily accessible and available in an environmentally friendly and sustainable manner[6]. The Ministry also works hand in hand with key industry stakeholders to provide an enabling legal and regulatory framework aimed at ensuring transparent, accountable, and prudent management of Ghana's energy resources. Key policies in place are the Income Tax Act 2015 (Act 896), the Local Content and Local Participation Regulations 2013 (Ll 2204), among others[7].

The main regulator of the industry is the Energy Commission of Ghana. Its regulatory roles as enshrined in the Energy Commission Act, 1997 (Act 541) include: i) development of regulations and codes for the electricity and natural gas supply in Ghana; ii) regulating the technical operations of service providers in the electricity and natural gas supply industries; iii) elaboration and enforcement of technical rules; and iv) developing the National Electricity Grid Code as part of its regulatory functions. The purpose of the distribution code is to ensure that the distribution network provides fair, transparent, nondiscriminatory, safe, reliable, secure, and cost-efficient delivery of electrical energy[7].

Power generation is the first arm of the power value chain in Ghana. Organizations performing the generation functions are the Volta River Authority (VRA), Bui Power, and some independent private power producers. These organizations combine hydro, thermal, and solar power generation for both local consumption and power export to neighboring countries. The total installed capacity for existing plants in Ghana is 4132 MW, consisting of Hydro 38%, Thermal 61% and Solar less than 1%[6].

Power transmission is the second arm of the power value chain. This process transports power from generating plants to local service areas such as cities, towns, communities, and neighborhoods[7]. Here, electricity is routed into a network of high-voltage transmission lines. The Ghana Grid Company (GRIDCO) owns and operates the transmission grid[6]. GRIDCO further steps down power to lower voltage for onward distribution by major bulk customers such as the Electricity Company of Ghana, Northern Electricity Company (NEDCO), and Enclave Power Company[6,7].

Power distribution is used to deliver power to end users. Distribution equipment includes transformers, meters, cables, and poles[6]. At this stage, the voltage is lowered further by a distribution transformer and channeled through the electric meter into homes and businesses. The ECG is the major distributor of power, with over 70% market share, mainly in the southern part of Ghana[7]. The NED is responsible for distribution in the northern regions of Ghana. Enclave Power Company, the only privately owned power distribution company, is responsible for distributions to the industries in the Free Zone Enclave in Tema[6,7]. **Figure 1** captures the various energy sector organizations in Ghana:

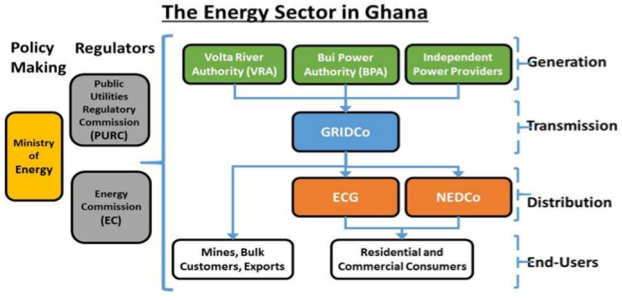

Figure 1. Energy sector organizations in Ghana.

Source: Adopted from MiDA[5].

3. Perspectives on the new social movement theory

This paper adopts the New Social Movement Theory relative to the study of Touraine and Melucci[8,9] due to its influence on organizational changes and transformations globally. The theory has lenses on transformational groundings, understandings, and explorations of women involved in peaceful movements for change. The theory adduced that any effort to explain and understand social change hinges on assumptions about the notion of transformations itself: i) transformation must take a top-down approach and ii) transformation must be time-specific to proffer meaning and understanding. Arguably, given the current gender transformation agenda within Ghanaian energy organizations, the dovetailing role of women energy workers is worth reporting.

The New Social Movement Theory further argues that actors associated with any form of transformation must necessarily bear movement membership cards and instead should collectively act to achieve their aim. The affected women, without exception, share acclimatization in opposition to the prevailing situation (prevalent gender orientations in energy organizations) and those in authority and power, which will make them seeable and flexible[9]. At this juncture, the merit and membership of movement supporters become central and provide energy for the relocation of members[10]. Just as other proponents of the theory explained:

> *The New Social Movement Theory centers on explaining the why of change, taking into account observable organizational characteristics such as invisible networks, associations, and emblematic constraints relative to the dominant order. The core purpose and objective of the theory centered on processes of action in line with bringing about a refashion or some amount of transformation, indicating that action and transformation occur continuously and entice a wider spectrum of appeal accordingly*[10].

Main features of the New Social Movement Theory, in the perspectives of the Melucci[9] are as follows: i) members act collectively and singularly, sharing desirability and cultures oppositional to the prevailing situation; ii) the manner in that members emerge is unsolicited, pointing out that time is ripe for a new world of solidarity; and iii) members' general outlook, values and orientations are in synch with the social institutions, through a complex web of engagements.

The proposed propositions of the theory bear similarities with ongoing happenings among women in energy organizations in Ghana. The new social movement theory, although historically originated in Europe, diffused to the global south, enhancing women's visibility and making their experiences impactful to the feminist knowledge production and effort towards gender equality and social transformations by the mid-1980s. In the name of globalization, Ghana became part of the new world order, and became associated with some women who made transformational moves with both local and international characters. In view of this, the paper seeks to explore current social transformative processes among women in energy organizations and how they are contributing to change in the industry.

4. Methods and materials

4.1. Study design

A case study design was used for the study. Case studies are noted for investigating contemporary social phenomena[11]. In this paper, three cases were explored, involving three energy organizations.

4.2. Sample and sampling

The units of analysis were the three understudied energy organizations. Women energy workers, directors, supervisors and contractors engaged to offer energy work services were also understudied. Both purposive and convenience sampling techniques were equally deployed in the study. **Table 1** presents a descriptive

representation of the main actors.

Table 1. Descriptive representation of the main actors.

Sample	Organization's description	Number of interviews/FGDs
Electricity Company of Ghana (ECG)	ECG is a limited liability company wholly owned by the Government of Ghana and operating under the Ministry of Energy. ECG is responsible for distributing electricity in the southern part of Ghana.	5/1
Ghana Grid Company Limited (GRIDCo)	GRIDCo is an independent transmission system operator formed in accordance with the Energy Commission Act, 1997 (Act 541) and the Volta River Development Act, 2005 (Act 692). GRIDCo is responsible for the operation and maintenance of all transmission lines throughout Ghana.	5/1
Volta River Authority (VRA)	VRA was established in 1961 by the Volta River Development Act (Act 46). VRA is the state-owned electricity utility responsible for generating electricity in Ghana and supplying electricity in bulk to the Ghana Grid Company Limited.	5/1
Total		15/3

Source: fieldwork, 2022.

4.3. Strategy, procedure and data analysis

Both primary and secondary types of data collection techniques were used. Interviews and Focus Group Discussions (FGDs) were conducted as follows: 15 interviews and 3 FGDs from each and every one of the understudied energy organizations. Participants' flexibility to reflect and discuss their experiences in detail was possible due to the interviews option[12]. The focus group discussions equally permit explicit use of collective engagements to elicit responses that were less accessible during individual interviews[13].

The duration of interviews and FGDs was 45 min and 60 min respectively. Working interviews were conducted at the respective workplaces of participants to gain insights into the motivational factors for gender transformations and how women in energy are contributing towards gender transformations in the industry.

Both the interviews and focus group discussions generated audio data. Audios were transcribed and organized thematically to reflect gender transformations in the world of energy work in Ghana. Handwritten notes were taken in the course of the interviews and focus group discussions to augment the data.

Data analysis was guided by both literature and research questions. The analysis began with open coding[11], breaking the data into pieces by associating words and sentences with codes such as "motivations" and "contributions towards gender transformations". Further axial coding was conducted, where codes that were conceptually similar were grouped into more abstract concepts. Finally, from these abstracts, concepts were aggregated into themes and developed to describe the studied phenomenon. The four aggregate dimensions that emerged from the analysis are movement as a result of collective frustration, creating awareness to change mindsets, mentorship and role models to empower other women, and transformation towards gender equality.

All quotes were verbatim and approved by the interviewees. The results generated then provide illustrations, typifying motivations for gender transformations leading to gender shapeshifting, with more women now taking up Ghanaian energy jobs. The informed consent rule and the protection of participant confidentiality were followed. Participation was voluntary, and pseudo-identities were used on the grounds of anonymity[14].

5. Empirical outcomes and discussions

The findings of the study are a pointer to gender transformations among energy organizations in Ghana.

Several indicators from the analysis showed women in energy jobs are motivated to inspire gender transformation in the energy industry and are therefore ready and willing to see those transformations come to fruition. The prime motivation for the transformations is collective frustrations due to dominant masculinity orientations among the energy organizations, and the formation of 'sisters in energy-solidarity' has been their core contribution to the transformative agenda.

5.1. Collective frustration as a motivation for gender transformations

The findings of the study showcased a phenomenon of collective frustration as a motive for gender transformations among energy organizations. Melucci[9] explained that motivation for social movement formation mostly happens when expectations are not met. This has manifested in a focus group discussion, where discussants explained:

> *Some male engineers are unwilling to accept female engineers as equally capable and competent engineers, and colleagues and sometimes seek to prevent them from taking up challenging jobs such as climbing electricity poles, ostensibly or genuinely out of concern for their wellbeing, this is an unconscious form of discrimination.*
>
> *Also,*
>
> *Sexual harassment is a barrier to women engineers smooth functioning, we experience both overt and covert forms of harassment. Again, recruitment, health and safety policies and practices are largely gender blind. Protective gears tend to be designed for males and are therefore ill-fitting for women engineers. Separate washroom facilities sometimes are not provided, and when they exist, they are barely ill equipped to cater for the needs of women.*

There is this wide perception among a section of Ghanaians that men are able to endure difficult tasks and perform high risk jobs better than their female counterparts. This featured prominently in the responses to my questions: Alima, a 35-year-old female electrical engineer, said:

> *... people always say energy related jobs are male domain because they are risky, dangerous and involve physical strength. My own mother sometimes scares me that I should stop the work and go for nursing or any other woman friendly job.*

Collective frustration occasioned strong social bonding among the 'sisters in energy solidarity.' This pushed them to exhibit strong determination and cohesion on the basis of their gendered outlook. This exhibition of common movement orientation motivated the women to feel united through the ties of the same occupational exposures and collective work-life experiences. Individual initiatives, creativity, and reflections are centered on collective interests. Though the sisters in energy solidarity differ in functions and personal desires, the nature of the solidarity hinges on their resilience, self-reliance, and resource mobilization to make a business case for gender transformations in the energy industry. This corroborates the New Social Movement theory of Melucci[9], noted for causing many organizational transformations worldwide. According to the study of Barry[10], the ability of a social movement to occasion a desired transformation depends on what resources are available and how effectively the resources are being utilized.

5.2. Gender audits, mentoring and coaching towards energy transformations

The knowledge of the fact that business sustainability hinges on diversity and inclusion motivated the Ghanaian energy organizations to adopt critical gender equity-driven steps. Such initiatives are either on gender equality, women's empowerment, diversity, or sustainable management, as captured in the Millennium Development Agency's gender equality and women's empowerment policy documents, which are a reflection of other energy organizations.

... by gender audits, we seek to improve the energy workplace environment and support creation of equal opportunities through gender policy and institutional capacity strengthening of the energy organizations. Millennium Development Agency and allied institutions have identified female associations as important entry points for leveraging efforts of strengthening gender policy and institutional capacity in power utility companies (Directorate, Social and Gender Inclusion at Millennium Development Agency).

At a focus group discussion, a participant had this to say, which reflects the views of many:

By intervening at the levels of education of females and industry: he Millennium Development Agency is preparing females to enter the power sector and rise to leadership levels and prepare the power sector to receive and groom females into leadership positions in the sector. Dubbed 'the Ghana Power Compact Internship and Mentoring Program (GPCIMP).' Under the program, female students pursuing courses in Science, Technology, Engineering and Mathematics (STEM) in the county's public universities, technical and vocational schools, get internships in private and public organizations in the power and energy sectors. (A 40-year-old female electrical engineer).

In an interview session, the Directorate of Social and Gender Inclusion at the Millennium Development Agency said, 'Our main aim is to prepare female STEM students for power sector careers through internships and mentoring opportunities.' This approach follows the Get-into-Energy (GIE) Career Pathways Model developed by the Centre for Energy Workforce Development (CEWD). The GIE Career Pathways Model is a roadmap for entry into careers in the electric and natural gas energy industry, which involves building energy competencies in girls from the early stages of their education; providing career navigation support, mentoring, and internships to post-secondary school, and retaining them in the energy sector by creating an environment in the sector that supports gender equality.

Within the GIE model, mentorship, coaching, and networking are central to the Millennium Development Agency's conception of how women's participation may be increased in the power sector. In this regard, a director of social and gender inclusion at the Millennium Development Agency said:

For female students to consider entering this male-dominated power sector, to realistically perform and ascend to leadership levels, they will need support, encouragement and inspiration from other females who have attained leadership positions in the sector. This support may best be provided through mentoring and coaching. Again, for females already within the sector to overcome the barriers to their participation at leadership levels in the sector, they will need the solidarity of other females.

In furtherance of the course of mentoring, coaching, and networking for women, the Millennium Development Agency and the energy-allied institutions in Ghana instituted an annual conference for women in the energy sector. The maiden conference was held from November 26–27, 2019, at the Labadi Beach Hotel in Accra. The conference, themed "Women in Energy: Positioning for the Future", was the first of its kind to be held in Ghana. It had the objective of promoting networking, the exchange of knowledge, harnessing the diverse experiences and best practices of female employee associations, leveraging strategies for advancing gender equality and social inclusion in power utilities, and improving organizational performance. Over a hundred participants attended the conference, from public organizations and private sector companies in power utilities as well as from civil society, the development community, and academia.

5.3. The 'sisters in energy-solidarity'

The 'sisters in energy-solidarity' is a movement composed of female energy workers found in a solidarized move towards a gender transformation in the historic male-dominance and masculinity cultures

among the energy organizations in Ghana. At the Electricity Company of Ghana, the women working there are known and called the 'power queens.' At GRIDCO and VRA, they are called 'GRIDCO Ladies Association' and 'VRA Ladies Association' respectively. The power queens and ladies' associations are founded and composed of all Ghanaian women employed and working in the energy sector. They epitomize a movement called 'sisters in energy-solidarity'. In an interview session, the president of the 'sisters in energy-solidarity' gave a reflection on their strategic plan:

> *Our strategy is to position females for leadership roles in the Energy sector by developing female employee associations into platforms of excellence where female employees are groomed, challenged and supported, through national advocacy, organizational policy interventions and individual mentorship, to excel in their organizational roles and rise to leadership positions in the sector.*

So being in a male-dominated setting, the 'sisters in energy-solidarity' acknowledged the fact that their strength lies in numbers; hence, the women felt their purposes, values, and orientations could best be served by mobilizing themselves and their resources. The 'sisters in energy-solidarity' serves as a vanguard, which works to institute and promote 'barrier breaking' and 'boundary crossings'[15], and are poised to turn the association into 'platforms of excellence' to champion educational, scientific, legislative, career development, and other programs. The 'sisters in energy-solidarity' equally foster gender transformative awareness to ensure gender equality among energy organizations. The manner in which the 'sisters in energy-solidarity' emerged is so spontaneous, and support[9] described as the right time to step forth into a brave new world of solidarity.

Also, energy organizations give women network groups space to grow and thrive. In this respect, an interviewee had this to say:

> *The 'sisters in energy-solidarity' aim at uniting women with one big voice! It also partners with management to serve as energy ambassadors. The 'sisters in energy-solidarity' carry out welfare activities for members, carry out public education at schools, churches and markets. Members engaged in energy conservation campaigns and launched a Conservation Guide geared towards children. Organizing annual women in energy conferences. The solidarity adopted schools in Akosombo, Obuasi and Tema, teaching the girls child basic hygiene and encourage them to pursue courses in Science, Technology, Engineering and Mathematics.*

Similarly, a 35-year-old electrical engineer said in an interview session:

> *... the first Ghana Women in Energy Conference brought together nearly 100 women professionals, representatives of power utility companies and governmental and non-governmental institutions in the power sector to discuss constraints and solutions aim at addressing barriers women face in the energy sector.*

The 'sisters in energy-solidarity' embark on advocacy against encroachment onto energy project lands and the use of energy as a as a right of way for petty trading. Solidarity equally provides welfare support to members by organizing health talks and talks from lawyers on issues such as how to write a will. Most of the members of the solidarity are young, so skills development programs are being organized for them. This is resulting in a paradigm shift from the traditional modes of 'doing gender' to illuminating social interactions and organizational policies, processes, and practices that reduce gender differences and weaken stereotypes in evaluating women in energy[15].

The gender-transformative energy initiatives have seen the energy organizations adopt gender equality policy initiatives and channel their recruitment efforts to target women! Just as a female interviewee in the interview session puts it:

> *... the 'sisters in energy-solidarity' has a high degree of management recognition. They make lots of contributions to their organizations such as revenue mobilization and addressing illegal connections that cause commercial losses. They serve as a conduit for management's Corporate Social Responsibility. They play key roles in the development of various energy organization's gender equality policies and they were instrumental in ECG's decision to recruit the first ever female, non-engineering staff member as a district manager.*

The apparent characteristics of the New Social Movement Theory were observed. First, the members act collectively as well as separately, sharing values and orientations that are opposed to the status quo[9]. Secondly, the 'sisters in energy-solidarity' emerged at the right time, giving voice to the latent dissatisfaction with the longstanding masculine dominant cultures in energy organizations and their associated gender inequalities. It also captured the desire for gender transformations in terms of policy initiatives and practices that are gender balanced[9]. Thirdly, the core values and orientations of the 'sisters in energy-solidarity' permeated the social fabric of energy works and allied institutions through a complex web of interactions[10]. The Women in Energy-Ghana explore the available platforms enthusiastically, deploying networks of civil society, micropolitical think tanks, and the offices of the Energy Commission for advocating, lobbying, and exchanging ideas to achieve gender-neutral energy works.

It is worth emphasizing that scholarship on gender transformations may long exist by various researchers in the field of gender, technology, and development studies; therefore, one may argue, there is no need for replication! However, most of such studies are foreign, Eurocentric, and global north-dominated, with relatively few studies on the global south and Ghana in particular. The current work, therefore, is a unique contribution to literature and knowledge in the Ghanaian context. More especially, knowledge on gender transformations within energy organizations was not found in the literature.

6. Implications and conclusion

Results from the current paper suggest collective frustration as a motivation for gender transformations in energy organizations. Notably, frustrated expectations, a low acceptance rate for female engineers, a lack of challenging jobs for them, sexual harassment, gender-blind recruitment policies and practices, and ill-fitting protective gear for females in the field of energy work This phenomenon of frustrated expectations may have practical implications for practice: first, as sources of frustration accumulate among the women energy workers, they may unleash their aggression on a convenient social target—in this case, the management of the energy organizations. And aggressive attacks on management imply that productivity will stall.

Also, the study showed that collective frustrations motivated gender transformations among the energy organizations, showcasing a regime of 'sisters in energy-solidarity' who appeared strong in character, mobilized available resources, and transformed the gender perspectives of the energy organizations. Such a gender transformation implies the empowerment of women to question and critically analyze issues of gender inequality and injustice and provides them with opportunities to challenge harmful norms and unfair practices.

The study equally pointed to a set of useful initiatives being initiated by the 'sisters in energy-solidarity' in collaboration with the Millennium Development Agency. They include the preparation of women for leadership roles in the energy sector by developing platforms of excellence where female employees are groomed, challenged, supported, and mentored to excel in their organizational roles and rise to leadership positions in the energy sector. These are useful initiatives with implications for gender equality, diversity, and inclusion at the leadership of energy organizations. Diversity and inclusivity are prerequisites for high productivity. And gender equality in energy organizations also resonates with good corporate governance and gender-driven social innovation in energy jobs.

The gender-driven and socially innovative energy jobs would further the cause of the 5th and 9th Sustainable Development Goals, which highlight the need to achieve gender equality, empower all women and girls, and ensure sustainable energy and inclusive industrial development, respectively. The importance of the energy sector in businesses, homes, and the wider economy is worth emphasizing, and the need for women to be included in developments in the energy industry is of sustainability essence.

In conclusion, the current work explored how collective frustration motivated gender transformation among energy organizations and, further, how women in energy contributed towards the gender transformations. The collective frustrations are, notably, sexual harassment, gender-blind policies and practices, and ill-fitting protective gear for women engineers. This provides an answer to the first research question: what are the motivation factors for gender transformation among women energy workers? The paper further identifies a regime of gender transformations, evident in the 'sisters in energy-solidarity' positioning females for leadership roles in the energy sector and developing female employee associations into platforms of excellence where female employees are groomed, challenged, and supported, through national advocacy, organizational policy interventions, and individual mentorship, to excel in their organizational roles and rise to leadership positions in the sector. These work well to promote gender neutrality in energy organizations. The women energy workers, working alongside the energy organizations, the Millennium Development Agency, and allied institutions, are deploying smart organizational models aimed at collapsing individual and self-seeking interests in pursuit of collective values and orientations in the form of a progressive but slow move towards achieving gender equality. This also provides an answer to the second research question: how are women in energy contributing to the gender transformations in the industry?

Conflict of interest

The author declares no conflict of interest.

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