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THE CHALLENGES FOR GENDER DIVERSITY AND INCLUSION IN THE WIND ENERGY INDUSTRY AND THE ESG PERSPECTIVE OF ORGANIZATIONS

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ABSTRACT

Context: Gender Diversity and Inclusion (D&I) has been a challenge for the energy and renewable energy industry. The wind energy industry has carried out a series of practices and initiatives to fulfil ESG criteria - environmental, social and governance, however the topic of D&I is still a paradigm for sector organizations.

Objective: This paper aims to present how the wind industry can promote D&I to meet ESG criteria, specifically, mapping industry challenges to promote D&I practices.

Method: The research methodology is a qualitative case study with 10 semi-structured interviews from different executive and managerial positions in organizations in the wind energy sector.

Results: The results demonstrated that there are a series of challenges and some ongoing practices, but the gap between these practices and initiatives and the culture of organizations is still a sectoral bottleneck.

Contribution: The scientific and practical contribution of the research lies in presenting a kaleidoscope with 5 main challenges for continuing the discussion of D&I in companies, as well as 10 practices reported by interviewees that unfold into a roadmap for the global wind sector.

Keywords: Gender Diversity and Inclusion, ESG, Wind Energy Industry.

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OS DESAFIOS PARA A DIVERSIDADE E INCLUSÃO DE GÊNERO NA INDÚSTRIA EÓLICA E A PERSPECTIVA ESG DAS ORGANIZAÇÕES

RESUMO

Contexto: A Diversidade e Inclusão (D&I) de Gênero tem sido um desafio para o setor de energia e energia renovável. A indústria eólica, por meio das organizações, tem realizado uma série de práticas e iniciativas para atender critérios ESG - ambientais, sociais e de governança, contudo a temática de D&I ainda é um paradigma para as organizações setoriais.

Objetivo: O objetivo do trabalho é apresentar como a indústria eólica pode promover a D&I visando atender critérios ESG, especificamente, mapear desafios da indústria para promover práticas de D&I.

Método: A metodologia da pesquisa consiste de um estudo de caso qualitativo com 10 entrevistas semiestruturadas de diferentes cargos executivos e gerenciais de organizações do setor de energia eólica.

Resultados: Os resultados demonstraram que existem uma série de desafios e algumas práticas em curso, porém o distanciamento entre essas práticas e iniciativas e a cultura das organizações ainda é um gargalo setorial.

Contribuição: A contribuição científica e prática da pesquisa reside em apresentar um caleidoscópio com 5 desafios principais para continuidade da discussão de D&I nas empresas, bem como 10 práticas relatadas pelos entrevistados que se desdobram em um mapa de ações para a indústria eólica global.

Palavras-chave: Diversidade e Inclusão de Gênero, ESG, Indústria Eólica.

1. INTRODUCTION

Fossil fuels were used excessively for long periods to support humanity's economic and social development process (Alves, 2014). The use of oil, gas and coal generated several environmental impacts on the ecosystem due to the high amount of CO_2 released (Nagelkerken & Connell, 2015). Thus, society, which began to consume more natural resources than the planet's regenerative capacity, needed to find more sustainable ways to produce energy, in order to avoid a collapse and depletion of natural resources (Barbosa, 2016).

The search and technological development resulted in alternative sources capable of producing energy in a clean way, that is, without carbon emissions and using inexhaustible resources (Alves, 2014). Among these sources, we can mention the production of wind, tidal, solar, hydro, geothermal and biomass energy (Tolmasquim et al., 2007), which have been growing their participation in the global energy matrix exponentially over the years.

Among emerging economies, Brazil stands out when it comes to the use of renewable sources. Its electrical matrix has an equivalent of 86% coming from renewable sources, with emphasis on hydroelectric power (53%), followed by wind power (13%) (ABEEólica, 2023). Clean energy sources, in addition to benefiting the ecosystem and offering environmental attributes, can also contribute to socioeconomic development. In the case of wind power, it coexists with agriculture and livestock in rural environments, in addition to generating several jobs in its production chain (ABEEólica, 2023; IRENA, 2020a; Paranhos, Silva & Cataldi, 2017; Simas & Pacca, 2013).

From 2011 to 2020, the construction of wind farms created almost 196 thousand jobs in Brazil (ABEEólica, 2023) and new wind farms are expected to be installed in the coming years, which will require 480,000 workers trained in construction, installation, operation and maintenance (Castilho, 2022; IRENA, 2021).

In the clean and renewable energy industry, women occupy 32% of the positions offered. However, the sector is still largely dominated by gender stereotypes that make it difficult to access Diversity and Inclusion (D&I) issues. Several factors were highlighted by IRENA (2020b) as obstacles to the promotion of gender D&I in the sector, such as: cultural and social sexist norms; qualification of functions of a masculine nature; lack of policies that encourage the participation and hiring of women in work spaces.

For every 1MW of wind power installed globally, 15 jobs are created. However, only 21% of this workforce is occupied by women (IRENA, 2020a). The female presence is even lower in technical environments, such as STEM (Science, Technology, Engineering and Mathematics) areas (GWNET, 2019). From this perspective, the growth of the wind industry requires that society mobilize efforts in search of a safe, diverse, inclusive and quality environment.

Despite some existing initiatives around the world, it is still questioned how the renewable energy industry, specifically the wind industry, has worked to promote gender D&I in the sector and meet ESG (Environmental, Social and Governance) criteria. Reports from IRENA (2020a, 2020b) argue that policies for D&I and government support must be established to foster the transition and boost the adoption of the ESG acronym in the corporate culture of organizations.

Therefore, the scientific gap in this research lies in understanding how existing practices in the wind industry can collaborate with the sector's D&I (Allen et al., 2019; Pearl-Martinez & Stephens, 2016). Furthermore, it is necessary to identify how the wind industry is dealing with gender D&I to meet ESG criteria that allow social assumptions to be rooted in the cultures of organizations (Cho et al., 2021). To this end, the gap to be filled in the literature is based on identifying the main challenges for deepening future research and the technical and corporate performance of ESG businesses in the renewable energy industry (Baratta et al., 2023).

Based on the contextualization and research gap presented, the general objective of the work is: *(i) to present how the wind industry can promote gender D&I in order to meet ESG*

criteria. As a specific objective: (ii) map the challenges of the wind industry to promote D&I practices in organizations that seek to meet ESG criteria.

The work presents as a scientific contribution the gap between ESG criteria and organizations' practices and initiatives, mapping a series of challenges linked to: organization culture, access to information, politicization, governance composition, professional training and politicization. Furthermore, the study demonstrated that a series of D&I initiatives are already underway, but are still insufficient and limited to meet ESG criteria. In parallel, the practical contribution identifies that these initiatives are a complementary roadmap for companies to not only start, but continue with actions that promote D&I in their organizational environments.

2. THEORETICAL REFERENCE

2.1 The Wind Energy Industry

Wind energy (from the Latin *aeolicus*, belonging to or related to Aeolus, god of the winds in Greek mythology) is any form of energy that comes from the wind (Lucena, 2023). Through equipment called wind turbines, or simply wind turbines, the kinetic energy of the winds is converted into electricity. Wind is considered an important source of clean, accessible and cost-competitive energy around the world (Lucena, 2021).

From 2015 to 2019, wind energy generated more than US$652 billion in investments (GWEC, 2020). It is believed that by 2030 a third of the world's electricity will come from solar and wind energy, increasing to almost 60% by 2050 – corresponding to a total installed capacity of wind energy exceeding 6,000 GW (IRENA, 2020c).

According to GWEC (2023), wind energy has reached the historic mark of 1 TW of installed capacity in 2023 over 40 years of its global history, and it is likely that global climate policies will lead to 2 TW of wind energy installed by the end of 2030, as a consequence of the increasing urgency in the fight against global warming, the prolonged high prices of fossil fuels, the impact of fossil fuel dependence on energy security and the success of the wind industry in expanding and establishing wind as one of the most competitive among reliable energy sources in the world.

In 2022, 77.6 GW of wind energy were installed in the world, bringing an accumulated wind capacity of 906 GW, of which 841.9 GW in the onshore market. The top five markets in the world for new installations in 2022 were: China, USA, Brazil, Germany and Sweden. In total, they accounted for 71% of global installations in 2022 (GWEC, 2023).

2.1.1 The Wind Industry in Brazil

The installed capacity of wind farms in Brazil exceeds 26 GW in commercial operation, representing 13.2% of its electrical matrix and placing the country, since 2021, in 6th place in the world ranking of wind generation. In 2022 alone, 4.06 GW of wind power were installed, the largest year with wind farms installed (ABEEólica, 2023).

The more than 900 wind farms installed in Brazil house more than 10,000 wind turbines, present in 12 Brazilian states. Around 90% of wind capacity is installed in the Northeast, demonstrating the region's energy potential, with a predominance of the states of Bahia and Rio Grande do Norte (ABEEólica, 2023). Wind energy supplies around 109 million Brazilians and, in some periods of the year, it can supply the entire electricity demand of the Northeast region, with a surplus, for an entire day (Agência Brasil, 2022).

The benefits of wind power go beyond high energy generation capacity and extend to the capillarity of investment returns to local communities. Land leases and investments made by companies to build new wind farms reflect a positive impact from the source. Every R$1.00 invested in a wind farm has an impact of R$2.90 on GDP after 10 to 14 months, considering the direct, indirect and induced effects. Data from 2011 to 2020 demonstrate the capacity to create more than 190 thousand jobs through wind power – a ratio of 10.7 jobs per MW installed in this period (ABEEólica, 2023).

Borges (2022) states that the benefits associated with the wind industry also bring externalities to the Brazilian economy. The author explains that, between 2011 and 2020, the wind sector accounted for around 0.5% of Brazilian GDP, having approached 0.8% of GDP in years of strong recession (such as 2015 and 2020), preventing further declines sharpest moments of Brazilian economic activity in those years.

2.2 Gender Diversity and Inclusion in Organizations

In the 21st century, the corporate world intensified its focus on D&I, based on internal initiatives and discussions. The reasons for this change are the increase in the participation of female workers, involvement of people belonging to different origins and multiple generations (Garg & Sangwan, 2021).

Diversity is a vast concept, and according to Kreitz's (2008) definition, it can be understood as any significant difference that distinguishes one individual from another. For Nkomo and Cox (1999, p. 335), diversity can be understood as “a mix of people with different group identities within the same social system”. The relationship between gender diversity and company performance is complex and there is a vast empirical literature leading to numerous research fronts (Mendes, 2016).

The Inclusion can be understood as the degree to which an employee realizes that they are an esteemed member of the work group through the experience of treatment that satisfies their needs for belonging and uniqueness (Shore et al., 2010). According to Garg and Sangwan (2021), the concept of inclusion needs to be examined together with diversity, so that important questions can be answered about harnessing the potential of a diverse workforce.

It can be seen, then, that gender D&I issues are linked to other important organizational characteristics, such as leadership, composition of senior management, culture and so on. Kakabadse et al. (2015) argue that gender diversity is a characteristic that improves the company's effectiveness, performance and reduces volatility, while Demsetz and Lehn

(1985) state that a forced change could have counterproductive results by not placing the correct person to occupy a position in question.

According to some authors (Noland, Moran & Kotschawar, 2016; Ali, Metz & Kulik, 2015; Kakabadse et al., 2015; Perryman et al., 2015; Opstrup & Villadsen, 2014; Singh & Vinnicombe, 2004), heterogeneity could become It is a resource for the organization if it implements an incentive policy and a strategic management structure. This is because, in addition to increasing the diversity of the company's skills, it improves information transparency and financial performance, reduces risk and increases the relationship of trust between investors, promotes debate, innovation, a better understanding of the organizational environment and more effective problem solving, in addition to promoting non-financial benefits, such as management models and the company's reputation.

Some authors consider that gender D&I in the energy sector is significant and far from balanced, despite women generally being seen as possessing valuable skills and knowledge (IRENA, 2021; 2020b; Baruah, 2016; Czako, 2020; Gwnet, 2019; Falcão et al., 2019; Pearl-Martinez & Stephens, 2016; Fraune, 2015).

The D&I management in companies is no longer a choice, but has become a crucial business imperative (Garg & Sangwan, 2021). Merely adopting practices to manage a diverse workforce does not serve the purpose; Organizations must go a step further and adopt initiatives that help them leverage or capitalize on D&I to achieve and sustain superior performance. Some studies (Yildiz & Mural, 2019; Sabharwal, 2015; Ryan & Haslam, 2005) point out that although working women are breaking the “glass ceiling” and advancing to top positions, they are still faced with discrimination.

2.3 ESG Criteria, Sustainability and their Relationship with Organizations

The debate around ESG criteria in organizations has gained significant momentum in recent years, stimulated by the development of Sustainability and society's expectations in relation to new business, production and consumption models around business model innovation (Barbosa et al., 2023; Nishitani et al., 2021). From this perspective, organizations have been challenged to deal with environments of high technological intensity and changeable processes (Noronha et al., 2022a; Neto & Cândido, 2020).

For Armstrong (2020), the concept of Sustainability refers to development that meets the needs of present society, without compromising future generations. Furthermore, Portilho (2005, p. 36) and Jacobi (2003, p.203) argue that sustainability can be practiced as a political and citizenship exercise between people and organizations (Noronha et al., 2022b). Meanwhile, the name ESG is rooted in the Triple Bottom Line, which observes the economic perspective of organizations on the bases of the environment, society and governance, analyzing operations in a holistic way (Noronha & Martins, 2022).

Furthermore, ESG as an integrated interdependent concept emerged in 2004, with the report Who Cares Wins: Connecting Financial Markets to a Changing World, through a partnership between the Global Compact and the World Bank (Pereira, 2022). This report was published to address issues of how the dimensions – environmental, social and governance –

would be treated in the capital market (Cipriano & Cabral, 2022). Therefore, the three ESG dimensions are explained below:

- Environmental: it involves the use of natural resources (such as energy consumption), waste management, recycling policies, and how environmental impacts can be reduced (Barbosa et al.; 2023; Rajesh, 2020). Furthermore, the term also refers to climate change, population growth and how this impacts the environment (Armstrong, 2020).
- Social: deals with the organization's relationships with its stakeholders - employees, suppliers, partners, customers and communities, also encompassing the promotion of D&I, non-discrimination and equality between employees (Barbosa et al., 2023; Li & Wu, 2020). In view of this, measures such as the creation of internal policies to encourage D&I and practices to promote equity are examples of business actions in alignment with the guidelines in this area (Pacto Global & Stilingue, 2021; Noronha, Silva and Borges, 2023).
- Governance: focuses on leadership, internal controls, executive compensation, audits, shareholder rights, anti-corruption policies and transparency and accountability practices (Barbosa et al., 2023; Cek & Eyupoglu, 2020).

2.4 ESG Criteria and Metrics in Organizations

ESG criteria have become synonymous with business sustainability, making their knowledge a necessity for organizations to remain competitive in the national market, by indicating solidity, better reputation and greater resilience amid uncertainties and vulnerabilities (Pacto Global & Stilingue, 2021).

In addition, the importance of *stakeholders* was noted for this process to be carried out, as stated in the *Stakeholder* Theory, developed by R. Edward Freeman in 1984 (Freeman, 2015), which suggests that the organization must create value for all interested parties (Xu, Liu & Shang, 2021). Therefore, ESG actions must be measured in order to identify important elements, collect relevant data and carry out internal comparisons and with other companies (Keeley et al., 2022).

Private organizations and their *stakeholders*, as well as public decision-makers, are trying to create market standards to metric ESG criteria, as well as launching numerous initiatives at a global and local level, while bringing greater transparency and clarity to investors (Atkins et al., 2023). Companies that effectively pursue good performance in sustainability actions must, according to Noronha et al. (2022b) and Nakagawa (2012, p.47), be ready to show the results of their practices to society and the market through reports, which must, through indicators, present results in the social, governance and environmental dimensions, contributing to the expansion of dialogue and relationships in the business environment in which the organization operates.

Furthermore, the International Integrated Reporting Council (IIRC, 2021, p. 2) advocates that companies carry out integrated reports because they improve the quality of information available to suppliers of financial capital, allowing for a more efficient and productive allocation of capital, as well as the Sustainability Accounting Standards Board (SASB, 2021), which provides

reporting standards for investors who want to evaluate how companies manage their environmental, social and governance factors, and how this impacts the organization's financial performance (Arvidsson & Dumay, 2022).

There is also the *Global Reporting Initiative* (GRI), which is an independent organization of international standards for sustainability reporting, supporting companies, governments and organizations in understanding and communicating their impacts regarding human rights, corruption, climate change, among others. complications, making the organization transparent and comparable to others (Luo & Tang, 2023).

3. METHODOLOGY

This research is based on the precepts of a qualitative Multiple Case Study of a descriptive nature, aiming to investigate gender D&I in organizations in the wind energy sector within the ESG perspective. The multiple case study is a method in which several studies are conducted simultaneously, with several individuals and several organizations (Ventura, 2007). The method described in the following subsections is a research approach that focuses on understanding, describing, and interpreting complex phenomena in their natural context.

3.1 Research Approach and Method

The methodological approach used in this research will be qualitative with a descriptive character. Qualitative research is characterized by deepening the interaction with interviewees, identifying discursive contrasts that enabled the understanding of gender D&I and the mechanisms used by organizations in the renewable energy sector. Furthermore, the qualitative methodology will aim to encourage debates and reflections so that the interviewee feels comfortable answering questions focusing on the reference discussed (Yin, 2015).

Qualitative research with a descriptive characteristic uses existing theoretical references for categorical analyses and explore relationships between theoretical lenses emerging from the literature (Kim, Sefcik & Bradway, 2017). It allows for a detailed understanding of the phenomena studied and contributes to theoretical knowledge and decision-making based on evidence.

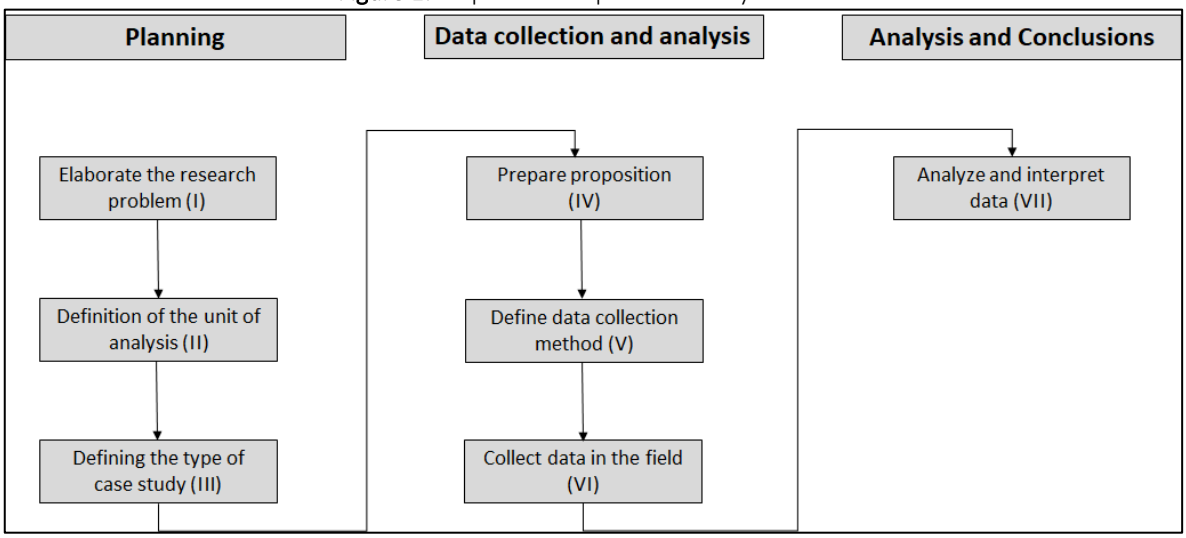
Furthermore, the qualitative method described was appropriate as it allowed companies in the wind energy sector to adapt to ESG practices and the challenges of gender D&I in this environment. Thus, this method considers the collection of all possible data in the field, to retain pertinent elements, in order to characterize the critical results to meet the objective of the study (Sandelowski, 2000).

The qualitative study included the analysis of multiple cases to look for similarities between the phenomenon and the object of study, reducing the analysis of a single conception of the object (Yin, 1994). In this way, the presence of several pieces of evidence makes it possible to mitigate the effect of unique particularities and, when this evidence converges, they strengthen the confidence and robustness of the method, supporting the inferences made based on the theoretical framework (Zainal, 2007).

3.2 Methodological Path, Instrument and Collection Period

The methodological trajectory of the Multiple Case Study included three stages, subdivided into seven main processes (Hafiz, 2008), as shown in Figure 1: *(i) Planning, (ii) Collection and Analysis and (iii) Analysis and Conclusion*, illustrating the processes adopted to develop the methodological work flow established for carrying out the research.

Figure 1: Steps for Multiple Case Study research



Source: The authors, based on research by Hafiz (2008).

Data collection resulted from the use of a research guide with semi-structured interviews. The interview script (Table 1) was the main collection instrument and its use was based on the theoretical framework. The questions applied were based on the theoretical lenses articulated in the research (Kallio et al., 2016).

Table 1: Research script used as a data collection tool.

Referential Categorical Block	Theoretical Frameworks	Research Guide Questions
Wind Industry	GWEC (2023); Lucena (2023b, 2019); GWEC (2020); IRENA (2020a, 2020b).	**Question 1:** How do you believe your organization supports D&I? **Question 2:** What are the main initiatives carried out to promote D&I in your workplace and in your sector? Could you give an example? **Question 3:** How do you believe your sector is approaching the issue of gender D&I?
Gender Diversity and Inclusion	Czako (2023); IRENA (2021); Falcão et al. (2019); Baruah (2016); Noland et al. (2016); Pearl-Martinez and Stephens (2016); Ali et al. (2015); Fraune (2015); Kakabadse et al., (2015); Perryman et al. (2015); Opstrup and Villadsen (2014); Singh and Vinnicombe (2004).	**Question 4:** How do you consider your company works on employee D&I in routines and processes? **Question 5:** What initiatives or actions have already been carried out that have covered different social and ethnic groups in the company or even promoted social issues? **Question 6:** Do you believe that your organization is far from the topic? If yes, cite an example that happened. If not, give an example of what could be implemented. **Question 7:** Do you have any idea what the average gender percentage is in your organization, board of directors or any management team in your company? Do you know if your sector or organization implements any initiatives to encourage them?

ESG Criteria and Organizations	Atkins et al. (2023); Baratta et al. (2023); Barbosa et al. (2023); Noronha and Martins (2022); Rajesh (2020); Li and Wu (2020); Cek and Eyupoglu (2020); Nakagawa (2012).	**Question 8:** In the social field, what are your organization's main initiatives and challenges to promote D&I? **Question 9:** In the environmental field, what are your organization's main initiatives and challenges to promote D&I? **Question 10:** In the governance field, what are your organization's main initiatives and challenges to promote D&I?
Additional Questions	-----	**Question 11:** Could you mention the main D&I challenges in the sector and the organization you are part of? **Question 12:** Could you mention the main D&I initiatives in the sector and the organization you are part of?

Source: The authors.

The use of the research script aimed to allow greater resilience when applying the questions, giving space for an informal conversation to unfold, as questions based on the theoretical framework were addressed during the interview process. This allowed the interviewer to direct the questions based on the theoretical framework and, at the same time, allowed the interviewee the freedom to demonstrate facts that went beyond perspectives, which could be relevant to the study. The interviews took place online and in person, targeting organizations that operate in the renewable energy sector in Brazil (Gil, 2008). The research collection period consisted of 2022 (January) to 2023 (March).

3.3 Research Context: Gender Diversity and Inclusion in the Wind Sector and Existing Practices

The context of this research is inserted in the Sustainable Development Goals (SDGs), designated in 2015 and adopted by all Member States of the United Nations, as part of the 2030 Agenda for Sustainable Development, under the coordination of the United Nations (UN) (Kronemberger, 2019). As a result, the current focus, at a global level, whether for private organizations and companies, or for government and civil society, is to follow the 17 SDGs and their 169 goals, with efforts from all parties being mandatory to achieve this (Seixas et al., 2020). Figure 2 demonstrates the 17 SDGs illustrated by the UN.

Figure 2: The 17 United Nations Sustainable Development Goals.

Source: United Nations (2022).

Among the 17 SDGs stipulated, this work fits into the multilateral support and transversal understanding of the objectives: *(5) Gender Equality, (7) Clean and Affordable Energy, (8) Decent Work and Economic Growth, (9) Industry, Innovation and Infrastructure and (10) Reduction of Inequalities.*

Some working groups, associations and institutions around the world have come together to carry out initiatives and stimulate practical and political discussions for the inclusion of women in the renewable energy market (GWNET, 2019). Organizations such as *Entrepreneurial Woman in Renewable Energy* (UK), *Hypatia* (Germany), *Women in Wind* (GWEC) and *Woman in Cleantech* (USA) run mentoring programs to help women in the clean energy industry advance their careers, host exchange among women who work or want to work in the renewable energy and clean technology industries, and build a network of professionals to promote women's roles in growing the green economy and making a positive impact on the environment (GWNET, 2019).

In Brazil, there have been initiatives by some energy companies in the last five years to establish D&I goals and encourage a greater female presence, whether in technical areas or in higher positions in the corporate hierarchy, albeit in smaller steps than, for example, example, in the banking sector (Lucena, 2023b).

In a steel wind tower factory in Pernambuco (Northeast region), 14% of the workforce is made up of women. Another company in the same industrial hub, supplier of wind kits, women represent 20% of all employees (Lucena, 2023b). The Brazilian Center for Gas Technologies and Renewable Energy showed that women represent just over 10% of enrolments in wind energy courses (FIERN, 2021).

Based on surveys, there are initiatives by organizations to operate wind projects with an all-female team - an example is the Tucano Complex (365.8 MW), in Bahia. To this end, the complex operator offered a technical specialization course in the operation and maintenance of wind farms in partnership with Senai-BA (Canal Energia, 2022). Another venture offered free professional training courses in communities neighbouring the Rio do Vento (RN) and Babilônia Sul (BA) wind farms, with 50% of vacancies reserved for women, in addition to other companies that also promoted training for women in construction for the installation of wind farms, in partnership with Senai-RN.

Another company, which has a majority male workforce (74% men and 26% women), has administrative vacancies that are distributed equally, but there is an imbalance in project implementation and operation and maintenance activities. A wind farm in Umburanas (BA) offers places for women on the Electrician Assistant for Wind Generators course, in partnership with Senai-BA (Canal Energia, 2022).

When considering that the sustainable energy sector will experience growth in the workforce from the current 11 million to 42 million employees in 2050 (IRENA, 2021), a cultural change becomes necessary, which, even if slow and gradual, must happen within organizations to ensure gender equality in their internal processes and policies. The time and effort spent trying to improve gender D&I in organizations will be wasted if organizations are

not able to identify representation and inclusion issues that may be leading to an inability to attract, retain, and develop diverse talent (Offshore Wind Industry Council, 2020).

3.4 Sample Selection Criteria and their Characteristics

The selection criteria for interviewees and organizations were established based on three guiding points described below. The selection of these criteria is linked to the objective of the work, aiming to understand the "how" of the case study and understand the main initiatives carried out to promote environmental, social and governance factors in organizations, articulating the theoretical foundations presented throughout the work. Table 2 presents the characteristics of the 10 interviewees.

- *Organizations and institutions in the wind sector:* the selected organizations and institutions are from the Brazilian wind sector, as the objective is to identify the practices established in the context of work research. Additionally, the wind sector is based on the production of clean and renewable energy, denoting the need to identify social practices for their technical replicability.
- *Executives, managers and professionals involved with the topic in their organization:* The selected professionals and executives are at management levels that can carry out and implement D&I practices in business.
- *Organization with D&I initiatives in its routine:* Organizations that have already implemented D&I and social promotion initiatives were selected, enabling deeper understanding of the research object.

Table 2: Sample Characteristics.

Interview Format	Nº	Company	Scope of Operation of the Organization	Interview Time	Interview Date
In person	Interviewee 1	A	Production Chain Association	38':32"	Jan/2022
In person	Interviewee 2	B	Energy Sector Communication Vehicle	44':15"	Jan/2022
In person	Interviewee 3	C	Workforce Training	52':12"	Jan/2022
In person	Interviewee 4	D	Energy Generation and Storage	22':54"	Jul/2022
In person	Interviewee 5	E	Energy Generation and Distribution	35':17"	Jan/2023
In person	Interviewee 6	F	Industrial Learning and Training Service	49':02"	Mar/2022
Remote	Interviewee 7	G	Wind blade manufacturing	25':10"	Nov/2023
Remote	Interviewee 8	G	Wind blade manufacturing	20':30"	Nov/2023
Remote	Interviewee 9	H	Manufacture of wind turbine components	28':30"	Nov/2023
Remote	Interviewee 10	I	Work safety and occupational health in wind farms	24':30"	Nov/2023

Source: The authors.

3.5 Data Analysis Technique: Content Analysis

The technique selected to assess the data collected in the field is "Content Analysis", used to organize and analyse the data in textual groups, which allows information to be extracted from the analytical process via interview transcriptions. This technique makes it possible to get closer to the interviewee, allowing you to understand feelings, intentions and even ideologies expressed during the interview. Therefore, this technique suits the scope of the research aiming to investigate social and discourse contrasts addressed during the research (Drisko & Maschi, 2015).

For this research, the fundamentals of data categorization were used based on the theoretical framework. The research categories are deductive and inductive. The deductive categories originate from the theoretical framework of the work: Wind Industry, Diversity and Inclusion and ESG Criteria and Organizations. The deductive categories are based on the scientific literature used to guide the researcher in the data analysis and measurement process. The inductive categories, on the other hand, present the results emerging from the work and which were not mapped in the literature presented throughout the theoretical framework or used as a theoretical basis for research. Furthermore, the inductive categories also mentioned in the literature as they are categories that identify the research findings, allow mapping discursive traits and contents of the analysis blocks that differ from the predictive deduction of research (Azungah, 2018).

The analysis of deductive and inductive categories was carried out in a hybrid way using the *MaxQda* research software and validation of the textual grouping manually. The software was used to assist in grouping the transcriptions, identifying each category presented through the theoretical framework or research finding. The use of the software guaranteed agility and support in the systematization for the analysis and inference of results and discussion in the process of writing research reports. On the other hand, manual validation was carried out in order to verify and validate what the software grouped as a result of the research, making it possible to map points, excerpts of speeches and nuances of interviews that were not included in the grouping and considered as a categorical repetition of research.

4. DATA ANALYSIS – CONTENT ANALYSIS

The data measured and transcribed from the work are concentrated in the data analysis and results and discussion sections. The categorical approach was used to organize the information extracted based on the theoretical framework and work findings. Additionally, word repetition is represented by ***(n)***, which indicates the number of incidences of repetition of the category in a qualitative way. The ***repetition numbers (n)*** were extracted with the support of *MaxQDA* software and guided the analysis, results and discussions of the article.

The data analysis technique through Content Analysis uses transcriptions as a qualitative source, enabling semantic and repetitive deepening to illustrate results based on tables, organizational charts, statistics and other techniques that facilitate the understanding of the main research results.

In order to organize the data analysis, five categories are presented that guided the inference of Results and Discussion, as shown in Table 3: *(a) Deductive Category: Wind Industry, (b) Deductive Category: Gender Diversity and Inclusion, (c) Deductive Category: ESG, (d) Inductive Category: D&I Challenges and (e) Inductive Category: Initiatives*. The division into subsections into categories is established based on the qualitative assessment of each category that represents the concepts and results used.

Table 3: Reports, categories and incidences used in the research.

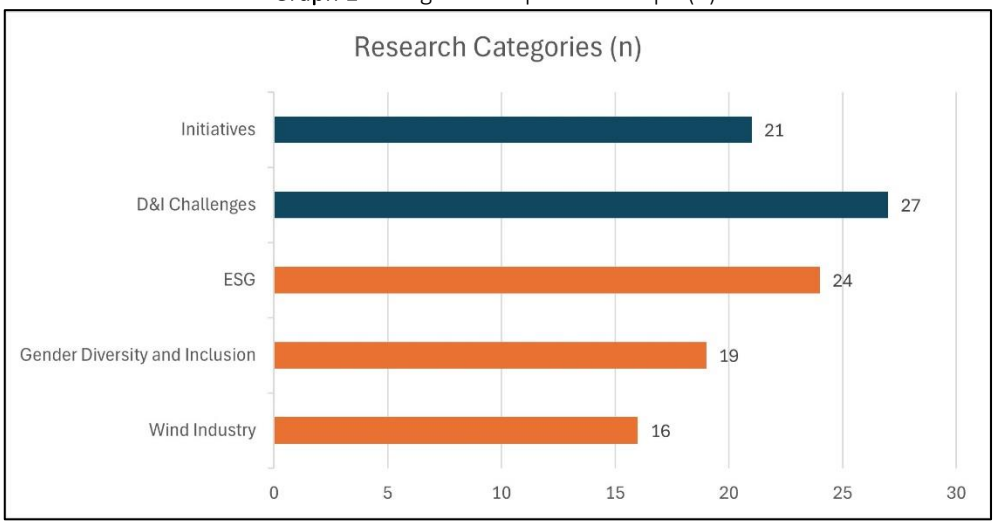
Category Type	Research Category	Repetition (n)	Transcription
Deductive Category	Wind Industry	16	[...] "It is a challenge due to the level of maturity we are at in relation to this issue of energy transition. From this understanding, from this movement, our question is to think about how we can ensure, in a fairer and more balanced way, greater participation of women in this market" [...] (Interviewee 4 - Company D). [...] "Although the company where I work helps with gender equality and encourages women in leadership, this segment is still very masculine, I have already suffered a lot of prejudice, especially in the technical area." [...] (Interviewee 9 - Company H)
Deductive Category	Gender Diversity and Inclusion	20	[...] "It is up to us, managers, to hire blindly to gender issues and some companies are doing this. They carry out the entire selection process without you knowing gender, whether you are female, male, whether you are white, black, what your sexual orientation is, because this way, you have a purer perception of the technical and management characteristics that the person has and that you is looking for. [...] During the work, we generated jobs and revenue for the municipality. But for the region, when we leave, there is nothing "left". So, the best way to leave a legacy in the world is education. That's why we invest in education projects." (Interviewee 3 - Company C). [...] "About D&I in our country, especially in our State (Pernambuco), I see that countless companies, especially large ones with a global structure and mentality, have been adhering in a big way to the expectations for equality and equity; a path long, but already started." [...] (Interviewee 8 - Company G).
Deductive Category	ESG	25	[...] "Without a doubt, the ESG agenda is increasingly discussed and puts pressure on the market. And as we have seen a great demand from investors in this regard, in addition to the urgent action against the effects of climate change and the energy transition, ESG actions will be fundamental to make the transformation happen at the right time. [...] We also have grassroots initiatives to employ more women in technical areas and invest in professional training. [...]" (Interviewee 1 - Company A). [...] "The pandemic years made us look more at people, and the S of ESG has never taken on such a large proportion as it is now. But when do we hear, in a business environment, talking so strongly about women's space, about people's development? Even about mental health? When did we hear about this? That's the S of ESG. So, in fact, this is an agenda that has accelerated a lot in recent years." [...] (Interviewee 2 - Company B).
Inductive Category	Diversity and Inclusion Challenges	29	[...] "My biggest challenge was/is having to deal with the machismo that still exists and is strong in the industry, some in a more hidden way and others explicit. But you still need to have a lot of emotional control and wisdom to deal with this theme, not only with the factory floor team, but with people in higher positions, such as managers." [...] (Interviewee 7 - Company G). [...] "I believe that we have proven our commitment and results, our space has been conquered, I think that we will still reach a point where we will no longer need to fear for the recognition of equality, as the majority will have already absorbed and recognized our merits." [...] (Interviewee 8 - Company G).
Inductive Category	Initiatives	21	[...] "At the end of 2021, we carried out a more careful internal assessment, investigating our number of men and women on racial and age issues. We identified that we needed to create an internal program and work better on that front, so we created the Diversity, Equity and Inclusion Program." [...] (Interviewee 2 - Company B). [...] "We started a (course) to understand how this market was and who the audience for our technical courses was, and we understood that we would need to participate in this movement of communicating and bringing the female audience to the interest of technological training." [...] (Interviewee 4 - Company D).

Source: The authors.

Among the categories that were most relevant are: *D&I Challenges, ESG and Initiatives.* These three categories were latent in the interviewees' statements, highlighting the sector's

main practices and initiatives, guided by ESG criteria. The other categories had less relevance and are discussed in depth in the results and discussion section, aiming to illustrate the main contributions of the article. The categorical difference can be seen in Graph 1. The categories in orange represent the deductive categories, while the categories in petrol blue represent the inductive categories.

Graph 1: Categorical Repetition Graph (n).



Source: The authors.

5. RESULTS AND DISCUSSION

The Results and Discussion section is subdivided into categorical separation presenting the qualitative inferences obtained in the field and illustrated in Table 3. Furthermore, the qualitative analyses were supported with the numerical relevance of repeating the research categories presented in Graph 1. The data of numerical repetition combined with qualitative inference strengthen the validation of the research and the results of the work demonstrated in the section below.

In general, all 5 categories from the literature and research findings represented a total repetition of (n) = 111. This number demonstrated that the fundamentals used to structure the research script were present during the interviewees' reports, reinforcing the pertinent application of selected literature and findings diagnosed in the field. The next sections divide the analysis into *Deductive* and *Inductive Categories*.

5.1 Results of Deductive Categories: Wind Industry, Gender Diversity and Inclusion and ESG

The Deductive Categories are divided between the referential foundations of Wind Industry, Gender Diversity and Inclusion and ESG. These three referential foundations have a total repetition of (n) = 61. During the interview, Interviewees 2, 4, and 9 illustrated in their reports that the Wind Industry has developed initiatives that are still insufficient to take root in the cultures corporate governance and governance of companies in the sector. However, it is noted that the commitment to political, global and governmental goals associated with the

Energy Transition, Sustainable Development Goals and social demands stipulated by financial institutions have boosted gender agendas in the sector, giving a voice so that minority groups can carry out practices such as materials, support networks and even the public declaration of commitments to inclusion.

Furthermore, the deductive categories were the main driver for all interviewees to present the daily social relevance that their representative organizations have in the wind energy sector. Through these categories, initiatives, challenges and practices were mapped and presented throughout this section.

5.1.1 Deductive Category: Wind Industry

The Wind Industry category presented the lowest incidence of repetition with a numerical representation of (n) = 16. Although this category had few repetition rates, qualitatively it opened space to deepen the debate on the main practices and gender participation in the sector. During the application of the script, the interviewees openly presented the cases and initiatives they experienced in the wind industry and some areas of work that require attention by organizations in the sector.

The Interviewee 4 exemplified that the energy transition is one of the main drivers of D&I initiatives in organizations and using wind energy and other renewable sources, companies seek to create more inclusive sectors from the beginning. Despite the efforts, Interviewee 9 commented that there is still a major challenge in technical training and preparation of organizations to deal with prejudice in gender D&I, especially in operational and technical work.

The reports demonstrated that although the sector seeks engagement with the energy transition and technologies, the subject must be further explored through support networks and regulations that ensure that organizations in the sector can expand gender D&I in a democratic-transversal way, changing the basis of organizational and educational culture (Interviewee 4). Furthermore, different perceptions were collected depending on the hierarchical level and professional position of the interviewees. These perceptions are associated with the work that the interviewees perform and how the organizational culture and the company's collective view the individual (Ryan & Haslam, 2005). On the other hand, at a strategic level there is recognition of efforts and actions to promote D&I, however, at the operational level, the actions are weakened, and according to those interviewed, there seems to be a lack of capillarity for the actions to reach all members of an organization and can have an impact on leadership as explained in the literature (Garg & Sangwan, 2021; Kakabadse et al., 2015).

5.1.2 Deductive Category: ESG

The ESG (n) = 25 category had the greatest representation among the block of deductive categories. The fundamentals of environmental, social and governance were diagnosed in different nuances of the interviewees' speeches. Interviewees reported that planning and actions at different levels (strategic, tactical and operational) need to be well

aligned so that they are perceived at all levels and reflect what ESG represents (Interviewees 2 and 8). It is necessary to have capillarity in the organizational hierarchy so that the operational teams experience the social actions proposed by the highest levels of the organization (Interviewee 1).

From an environmental point of view, Interviewee 1 mentioned that the main stimulus that drives the wind industry to become increasingly inclusive is the political and geopolitical pressure from the markets to include different audiences. This inclusion, driven by the need to reduce environmental impacts, should move organizations to aggregate and include diverse audiences that modify the basis of the corporate system, including new forms of management and organizational culture that will shape the future of technology (Silva & Janes, 2020).

Still in a similar prerogative, the ESG social team demonstrated that despite the relevance that the topic has received in recent years, a large part of the executive teams and technical and operational teams are still mostly dominated by white men, putting a squelch on D&I, as reported by Interviewee 2. Furthermore, initiatives must be observed in a transversal way, including not only gender, but other groups in society so that they are empowered in this process. Thus, it was mentioned that career promotions need to follow objective criteria, such as length of service, without distinction of gender. Additionally, interviewees reinforced that career plans must have equal pay. Salaries need to be equivalent by function, not by gender.

In terms of governance, the interviewees reported that in addition to the composition of the administrative councils (Interviewees 1, 2 and 4), the environments are unprepared to deal with the issue and this becomes an organizational-corporate culture challenge. According to the sample's reports, within the in-depth organizations, there is no prior work carried out by human resources teams to create support networks or even initiatives to promote mental health at work in gender D&I in a specific way. Also, transparency, clarity and widespread information can mitigate a series of adversities experienced by women and social groups within these organizations. Interviewees also mentioned that a diverse company, with different ways of thinking can develop better, take less risk and generate an innovative and creative environment.

5.1.3 Deductive Category: Gender Diversity and Inclusion

The Gender Diversity and Inclusion category had an indication of repetition of (n) = 20. The category presented itself as the second most relevant category among the inductive categories. This is because during the interviewees' foundation, there are still a series of challenges and opportunities to develop practices associated with existing organizational culture models.

The interviewees unanimously highlighted that there is a need to reduce inequality in organizational commitments, focusing discussions on the need to deepen the social sphere (Interviewees 3, 4, 7 and 8). Especially, according to Interviewee 3, mechanisms are needed to manage and measure organizational changes to defend the ESG agenda, turning executives' actions to value gender actions.

Interviewee 8 highlighted that a series of initiatives were also carried out. Among the initiatives, support networks to expand gender participation, wind farms operated by women and specific training courses for different social groups were mentioned. It was reported that for these initiatives to continue being carried out, a social diagnosis is necessary that takes into account the previous preparation of professionals and the encouragement of government institutions in local regulation.

Interviewee 3 also reinforced the need for greater transparency in access to information, while companies point out difficulties in obtaining local skilled labour, due to the remote location of wind farms in Brazil. These regions lack professional training for the population and the role of women can be understood differently by local social groups, especially in economically disadvantaged regions, making it difficult to promote D&I actions.

Furthermore, the reports of Interviewees 7 and 8 reinforce that the insertion of D&I policies and the ESG agenda across organizations could have a relevant role in decision-making. Despite the organizational reality, good practice manuals, forums and sectoral policies were the most commented topics in the research as possible driving mechanisms for change in the organizational culture of companies.

5.2. Inductive Category Results: Diversity and Inclusion Challenges and Initiatives

The Inductive Categories are the research findings that emerged in the interviewees' reports as categories that were repeated, in addition to the theoretical foundations addressed. These categories are: *(a) Diversity and Inclusion Challenges and (b) Initiatives* and their sample repetition is (n) = 50. Interviewees 2, 7 and 8 presented reports that demonstrate that despite the attempts of companies in the wind sector to promote D&I actions, the challenges are still more latent than the initiatives.

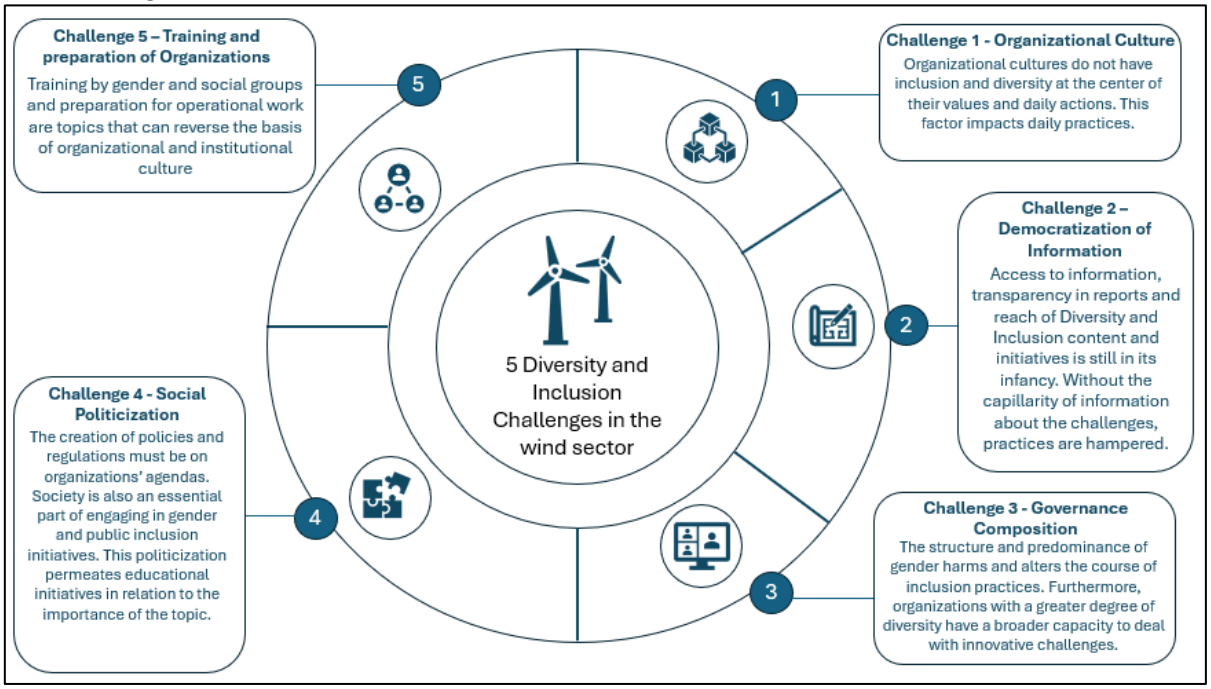
On the other hand, it is important to highlight that despite the slowness of organizations to adapt in a new governance context, there are ongoing practices that can be improved to accelerate awareness of D&I through ESG criteria. The composite results of the categorical analyses are presented and deepened in the sections below triangulating the interviews.

5.2.1 Inductive Category: Diversity and Inclusion Challenges

The Inductive category of Diversity and Inclusion Challenges was the most relevant category in the research and presented itself as research finding with a representation of (n) = 29. This inductive category emerged as a finding in the research, as the majority of those interviewed addressed the selected themes as an ongoing challenge for the wind energy sector at a national and global level.

In general, interviewees 1, 2, 4, 7 and 8 listed challenges that range from organizational culture to operation and maintenance practices in wind farms, making it possible to highlight five main challenges in mapping this category: (1) Organizational Culture; (2) Democratization of Information; (3) Governance Composition; (4) Social Politicization; and (5) Training and Preparation of Organizations. These challenges are presented in Figure 3 and will be further explored in this section as part of the results of the interviews carried out.

Figure 3: Kaleidoscope of Diversity and Inclusion Challenges in the National Wind Sector.



Source: The authors.

Challenge 1 - Organizational Culture

Despite initiatives explained through the reports of Interviewees 2 and 4, organizational cultures still lack clear guidelines to promote greater public and gender diversity in organizations. Respondents reported that most executive bodies are dominated by white men in executive and management positions. Furthermore, the culture of organizations, arising from definitions of boards of directors or executive bodies, maintain traditions that hinder the possibility of a clearer ESG agenda, preventing actions from being disseminated throughout organizations (Noronha & Martins, 2022). Defining goals and objectives, in addition to incorporating initiatives, was approached as a recommendation for changing organizational culture and conservative traditions in company routines and processes. To achieve this, ESG criteria must be transversal to company culture, spreading D&I initiatives (Interviewees 4 and 8).

Challenge 2 - Democratization of Information

Sustainability reports indicating initiatives were one of the practices mentioned by interviewees, however these practices are still at the operations level and need to have a more concentrated approach to the organization's culture so that the different levels of the company can understand the rights and duties they must create an environment with easy access to information (Portilho, 2005). According to Interviewee 2, managers should promote integrated communication initiatives internally and externally to their organizations, informing support practices and initiatives from networks and courses that promote education, training and opportunities for women within organizations. Furthermore, the interviewees demonstrated that the democratization of information goes beyond the

organizational and private sphere and should be observed as a way of raising awareness in society of the need to include gender D&I activities (Jacobi, 2003).

Challenge 3 - Governance Composition

The composition of administrative boards and corporate structures is mostly dominated by white men over the age of 35. This predominance means that initiatives carried out at the corporate level do not follow decision-making in a homogeneous way (Interviewees 1 and 8) (Neto & Cândido, 2020). The challenge of expanding the diversity of executive bodies and corporate governance must be levelled by goals, in the same way that there are climate goals to meet ESG criteria, structuring corporate policies and compliances to face them from new innovation lenses. Furthermore, Interviewee 2 highlights that careers in the areas of science, technology and engineering should be encouraged, including women and the elderly to achieve gender equality, without depending on the existence of public regulation.

Challenge 4 – Social Politicization

Another challenge presented in the reports is associated with the careful assessment of compliance with standards established in the regulatory, legal and social spheres (Interviewee 2). The civic participation of employees and people involved in the organization must be encouraged by programs and support networks. In this way, the organization must play a central role in engaging audiences in the process of understanding differences and polarizations within the institution (Li & Wu, 2020; Noronha, Silva and Borges, 2023), promoting an environment and industry that is prepared to face inequalities in different management positions within organizations (Interviewees 4 and 7). The challenge of politicization involves the need to combat inequality that is silent in the organization and occurs in the details of management in the daily lives of companies (Barbosa et al., 2023), implying a high degree of maturity in the application and evaluation of ESG criteria and actions (Interviewees 7 and 8).

Challenge 5 - Training and preparation of Organizations

According to Interviewee 4, the training and preparation of organizations to support dissemination and education on the topic is still scarce in organizations. It is necessary to promote education, training, sisterhood and opportunities for women in organizations, aiming to expand the provision of courses and support networks to combat prejudice (Interviewee 8). In this way, it was observed that the challenge of training is associated with reducing differences in the processes of social politicization and understanding of the cause. Training should also be seen as a mechanism for basic and preliminary education, encouraging children to deepen their understanding of the importance of more inclusive and diverse environments.

5.2.2 Inductive Category: Initiatives

The Inductive Initiatives category had a representation of (n) = 21. In this category, most of the interviewees demonstrated that they value the initiatives within their

organizations aimed at promoting gender D&I in the wind industry, while recognizing the need for more actions aimed at strengthening and consolidating in the medium and long term, in a continuous and systematic way.

The questions related to education and training were considered critical points for employment in the wind industry in all areas, and accelerated training is seen as necessary due to the rapid advancement of this type of energy around the world. In Brazil, there has been a lack of professional qualifications to meet the needs of wind projects in their various phases, from project design and technological development, to installation, operation and maintenance. Skills gaps create bottlenecks in the implementation of wind projects, which can lead to cost overruns, delays and cancellations, as well as faulty installations, rework, performance issues and a negative public perception of renewable energy technologies. Some initiatives attempt to reduce this gap through internal training programs and accelerated training of local labour.

At the same time, public and private educational institutions have offered specific courses, in the most diverse disciplinary backgrounds, including engineering, energy analysts, economics and planning, at different levels and teaching modalities, but face challenges in this aspect, as the number of teachers working in the wind sector is still small in Brazil. In this work, a total of 10 gender D&I practices and initiatives promoted by companies in the wind sector operating in Brazil were mapped, presented in Table 4.

Other actions were identified in the reports of Interviewees 1 and 3. It is clear in all mapped initiatives that there is a search to increase gender D&I with a focus on the operational hierarchical level, as it is the most technical and has the least participation of women. It was also identified that the actions are mainly aimed at accelerated technical professional training in STEM areas, in partnership with renowned educational institutions in vocational technical education.

By promoting accelerated professional training for local communities and offering exclusive vacancies for women, the wind industry ends up contributing to greater equity in employability and income distribution and a substantial improvement in women's rights and conditions. They also provide a greater quality of life and equal access to resources and social services.

Table 4: Gender D&I practices and initiatives in the wind industry mapped in the research.

Institution	ESG criteria met	Initiative	Purpose	Description
AES Brasil	Social Environmental	Operation of a wind farm by women.	Increase the participation of women in the operation of their wind farms.	Took a Technical Specialization course in Operation and Maintenance of Wind Farms in partnership with Senai-BA. It operates the Tucano wind complex (365.8 MW), in Bahia, with a 100% female team.
Casa dos Ventos	Social Environmental	Training of female labour.	Increase the professional training of women in communities local to wind farms.	It allocated 50% of the places on free professional courses to women from communities neighbouring its Rio do Vento (RN) and Babilônia Sul (BA) wind farms.
EDP e EDP Renováveis	Social Governance	Global campaign #Rebelsforchange	Raise awareness and promote greater participation of women in STEM careers.	Dissemination of testimonials on social networks from employees in technical careers. Association with the campaign of female public figures who have led several actions to promote women in different professional areas. Apply in some technical areas through a specific website.
Elera	Social	Training of female labour.	Increase the participation of women in the installation of their wind farms.	It has a partnership with Senai-RN to offer training courses for women in the construction of wind farms.
Engie Brasil	Social Governance	Workforce training. Distribution of administrative vacancies between men and women.	Increase the participation of women in the company, both at administrative level and in O&M of wind farms.	The wind project in Umburanas (BA) offers vacancies for women. Partnership with Senai-BA to offer training courses for electrician assistants for wind turbines. Partnership with Senai-RN for training in wind and photovoltaic generation in Lajes (RN).
GWEC / GWNET	Social Governance	Global Mentoring Program "Women in Wind".	Increase the participation of women in leadership positions in the wind sector.	It offers a mentoring program, with annual classes of 20 people. The mentors are leading professionals in the sector and the mentees must be active in or come from emerging countries in wind energy.
IFPE	Social	"Women in Wind" Project.	Accelerated training of technical and higher education women students for the wind sector.	The project promotes an immersion in the local wind industry aimed at solving real problems raised by partner companies. It has already qualified more than 270 women in wind energy.
LM Wind Power do Brasil	Social	Hiring young female apprentices at the wind blade factory in Pernambuco.	Increase the participation of women in the company's Young Apprentice Program.	Hiring 30 young women for a professional learning opportunity.
Vestas do Brasil	Social	Workshop "Teaching the future: school practices in energy"	Encourage the inclusion of content on wind energy in public schools.	Development of exercises and activities for mathematics classes in the state (RN). Offer of 50 vacancies for mathematics teachers in the 1st year of high school in partnership with Senai-RN.
Vestas e EDP Renováveis	Social Environmental	Program "Keep it local"	Boost employability in rural areas where wind farms are installed.	Trained 25 people to operate and maintain wind farms. More than 50% of the audience were women, in partnership with Senai-RN.

Source: The authors.

According to those interviewed, the entry of large wind energy business groups in the Northeast Region, with their social responsibility policies and compensatory measures included in environmental licenses, helps to boost the socioeconomic development of local

communities, since the region is home to cities with the lowest Human Development Indexes and, at the same time, it has the largest installed wind capacity in the country.

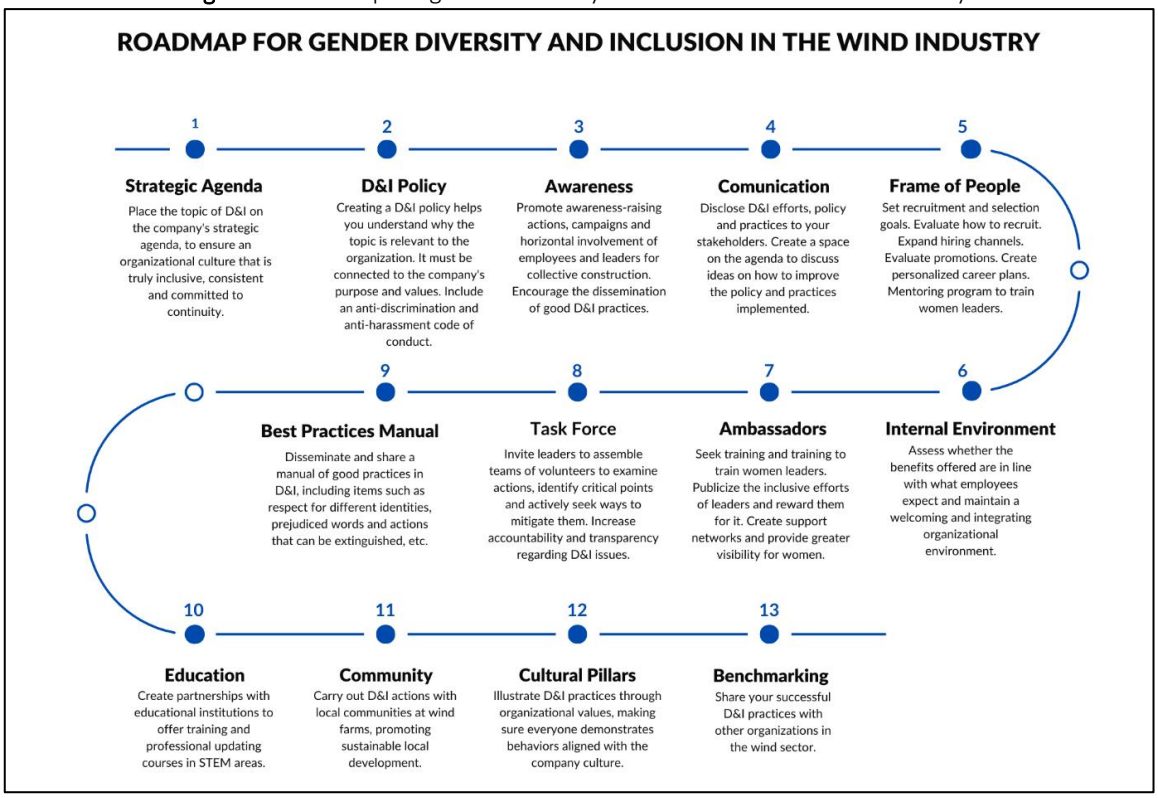
From this perspective, we also observe that gender D&I practices contribute to greater public acceptance of wind energy, as initiatives take place at a local social level (community acceptance). And it is understood, even from the experience of other countries such as the United States, that social acceptance is crucial to the successful development of wind energy. Lucena and Lucena (2019) explain that the way the public engages with wind projects may be more important in shaping public reactions to new projects than the purely physical or technical characteristics of wind energy generation technology.

In this way, the practices aimed at gender D&I and mapped in the research and the initiatives identified by the interviewees in their organizations unfolded in the creation of a guide to support the implementation of gender D&I actions in the wind industry, which are consolidated in the roadmap of the Figure 4.

The roadmap suggests that D&I initiatives go beyond a manual of good practices and a transversal diversity policy, which in themselves are quite efficient, but not sufficient, as well as other specific actions focused on commemorative dates, events and hiring numbers.

According to Gupy (2023), for D&I efforts to be successful, it is necessary to involve the presidency and leaders from the beginning (top-down movement). Giving women space to speak and respecting their positioning is a way for them to feel safe enough to contribute their knowledge and perspectives. At the same time that strategic D&I actions must be top-down, the sense of belonging (inclusion) happens bottom-up. A truly inclusive organizational culture provides innovative, creative environments with psychological safety, resulting in high-performance teams and reduced turnover.

Figure 4: Roadmap for gender diversity and inclusion in the wind industry.



Source: The authors.

It is also important to review potentially discriminatory factors in the job offers themselves. To increase D&I in different positions, it is interesting to draw up career plans that take into account the difficulties that people from minority groups often face. A mentoring program to boost the development of minority professionals, with sessions on careers, challenges and encouragement. While white men tend to find mentors on their own, women more often need help from formal programs (Gupy, 2023).

There are countless possibilities, from encouraging women to enter STEM areas, through training courses at technical and higher levels, so that they can take on professional leadership roles in the medium and long term; the increase in partnerships between the private sector and teaching and research institutions for RD&I projects, to solve real industry problems, to structure laboratories, teaching and research grants, giving opportunities to women; carrying out affirmative collective hiring processes, etc. The moment these possibilities are created, women are empowered and begin to believe in themselves and occupy those spaces previously considered impossible.

In this way, organizations aligned with the D&I agenda seek more human contractual relationships, without choosing gender, without a predisposition to a college or any topic in that sense. The role of enterprises is not limited to building wind farms; they need to ensure that local development is continuous, consistent and sustainable, by mobilizing and exploring local potential and, at the same time, ensuring the conservation of natural resources. With this, D&I is part of a movement that was born in the organization and goes beyond its walls, in tune with the quality of life of the local population, economic efficiency, the conservation of natural resources and efficient public management, mediated by a good governance.

6. FINAL CONSIDERATIONS

The data analyses and results of the article presented evidence to meet the objectives of the work, which reside in *(i) presenting how the wind industry can promote gender D&I to meet ESG criteria and (ii) mapping the industry's challenges to promote D&I practices in organizations that seek to meet ESG criteria.*

In relation to objective (i) the article presented practices that are already underway being carried out by the industry such as support networks, operation of wind farms carried out by women, training courses, hiring that meets D&I criteria and even mentoring programs that aim to meeting ESG criteria. It was observed from the interviewees' reports that gender D&I initiatives are not intermediate factors to meet the ESG criteria, but that the criteria must be based on social factors to promote gender D&I in organizations

The mapped practices and identified initiatives are an initial driver to stimulate a sector that can benefit from innovation from gender D&I. Furthermore, these practices tend to help with cultural rooting in the governance policies of companies that decide to implement these strategies. Based on surveys of interviewees, 10 initiatives that have been carried out and are ongoing in the wind sector globally and in Brazil were mapped (Table 4).

On the other hand, the objective was met based on the results that mapped the existence of 5 main challenges to continue promoting gender D&I. These challenges are presented in "Kaleidoscope of Diversity and Inclusion Challenges in the National Wind Sector" and are called: *(1) Organizational Culture; (2) Democratization of Information; (3) Social Politicization; (4) Governance Composition; and (5) Training and Preparation of Organizations.* Furthermore, despite existing practices in the sector, the initiatives are insufficient to fill the social and organizational gap that these challenges bring to the sector. Interviewees reported that organizations are still accommodated in traditional governance formats and there are several restrictions for implementing strategies and corporate policies to change the diversity framework.

The main scientific contribution of this work lies in presenting the gap that still exists between the ESG criteria practiced by organizations and the policies and initiatives for gender D&I in the renewable energy sector (Allen et al., 2019). In addition to practices mapped as an example and route of action, challenges linked to the culture of organizations, access to information, politicization, governance composition and professional training were mapped (Pearl-Martinez & Stephens, 2016; Baratta et al., 2023). The data demonstrated that these challenges have an impact on the future of the sector and the fight for gender equity in the coming years, and if they are not addressed, they could cause an asymmetry in the social justice of the energy transition.

The practical contribution lies in the presentation of 10 initiatives that have been implemented to meet ESG criteria through D&I. It was observed that these initiatives should be a starting point for meeting criteria and modifying organizational cultures (Cho et al., 2021). Furthermore, practices indicate that the regulation and opening of new markets (e.g. Carbon Market) can provide insight into initiatives already underway so that companies establish ESG criteria based on gender D&I in their routine and governance.

Still in relation to the practical contribution, the recommendations proposed in the roadmap are low to medium cost and suggest actions that promote D&I in their micro and macro-organizational environments, creating a diverse, welcoming and inclusive space for women, while also suggesting initiatives that include local communities in their projects. Companies that make room for D&I, innovate and grow more, as they contribute to the expansion of the teams' worldview due to the exchange of knowledge and experiences.

6.1 Limitations and suggestions for future research

The limitations of the research lie in the scarce literature relating the themes of wind energy, renewable energy and gender D&I, making it difficult to use literature for structuring references when conducting the research. On the other hand, this gap in science also presented itself as an opportunity for researchers to identify not only the practices and challenges, but the behavioural and psychological factors that present themselves as barriers to delving deeper into the culture of organizations.

As a suggestion for future research, carrying out reviews and bibliographic techniques to provide understanding and proximity to the theoretical references used in broad areas of science could pave the way for the future of discussions.

Additionally, new research avenues suggest investigating the challenges encountered in this research, which range from organizational culture to professional training and support networks. For this deepening to occur, it is necessary to carry out future qualitative and quantitative research on cases that already implement practices, identifying bottlenecks and opportunities to leverage gender D&I in the global wind energy sector.

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