# MANAGING WORK FORCE DIVERSITY IN THE RENEWABLE ENERGY TRANSITION: A CASE STUDY OF 80 MW WIND POWER PROJECT IN THE STATE OF MAHARASHTRA

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## Abstract

Diversity and diversity management in multicultural workforce is increasingly becoming an important issue for the business in the era of globalization. It affects the productivity and efficiency of the workforce in general. The purpose of the study is to encompass the dimensions of diversity management in a practical company. Particularly, the study shed light on the diversity management issue of a multinational organization. As the energy sector transitions from fossil-fuel dominated systems toward more efficient, sustainable renewable-based systems, new opportunities for a more inclusive energy workforce are emerging.We have analysed the diversity management journey during the Construction & Operation of an 80 MW Wind Power Project owned by Panama Wind Energy Godawari Private Limited giving particular focus on diversity dimensions and strategies. The paper also highlights the theoretical aspect of 'paradigms of diversity management' and its application to Energy Project Companies. We have analysed Panama Renewable Energy Group's diversity inclusion model and its own way of managing diversity in multicultural workforce. Although

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research demonstrates that diversity enhances innovation and creativity, there is minimal attention to considering and promoting diversity within the energy workforce. We explore how greater consideration of the role of gender and the value of diversity in energy projects could provide multiple social benefits, including promoting more sustainable practices, accelerating innovation, enhancing women's opportunities, and empowering communities to engage in energy-system change.

**Keywords:** Multinational organization,globalisation,energy project, energy sector.

**JEL classification: R11, Q11, L21, Q10**

## Introduction:

The concept of diversity management (DM) is increasingly promoted as astrategic people management technique that will enhance organizational competitiveness. Some U.S owned multinational corporations (MNCs)have been rolling out domestic-designed DMprograms to their global operations (Nishii &Özbilgin, 2007). The concept of diversity which originated in U.S in the late1980's has seeped into countries across the world. In the lasttwo decades; it has been embraced by the organizations byrealizing the strong linkages between the inclusion of diversityand business competitive advantage (Fluery, 1999).Theconcept that started as an initiative to provide equalemployment has today translated into a wider industry widepolicy of diversity.

A gender imbalance within the energy sector is apparent to many observers, yet the role of women in the energy workforce is not being systematically characterized. Diversity and inclusion are critical in the renewable energy transition. If intentional consideration of gender diversity is not prioritized, the changes have potential to perpetuate and deepen, rather than reduce, gender inequality. Greater understanding of the gender gap in energy-related industries, as well as more widespread

acknowledgement of the positive potential of gender diversity in this sector, would likely promote more sustainable energy practices, accelerate energy innovation, expand opportunities for women, and encourage greater social engagement in energy-system change.

**Knowledge Gaps on Workforce Diversity in the Energy Workforce**

Limited information about the level and nature of women's employment in the energyworkforce presents a challenge to exploring the relationship between gender diversity in relevant industries involved in the renewable energy transition (Baruah, 2015). One recent assessment of gender-workforce imbalances suggests a larger gapin the energy sector than other major industries (Ernst & Young, 2015). Within energy organizations, gender diversity is found to be most advanced in consumer services and consumer goods, while power and utility entities are less gender diverse, and infrastructure entities lag the farthest (Ernst & Young, 2015).

**Diversity**

Diversity can be defined as a mixture of people with different group identities within the same social system (Fluery, 1999). Diversity includes factors such as race, gender, age, colour, physical disability, ethnicity, etc. (Kundu and Turan, 1999).Companies have decided to incorporate diversity and consider it as essential part of their business strategy (Hayesand Mandez, 1997; Palich and Gomez, 1999) for keeping and gaining market share, reducing costs, increasing productivity and improving quality of management (Morrison, 1992) etc.as business case.

This inclination towards increasing diversity provides an impetus to recognize the need for "diversity management" in the organization. Diversity management (DM) is defined as; "planning and implementing organizational systems and practices to manage people so that the potential advantages

of diversity are maximized while its potential disadvantages are minimized" (Cox, 1993). Further, Cox and Blake (1991) posits that to implement these practices effectively, there is a need to align these practices withorganization systems. Moreover organizations are recognizedas social system and according to principle of system theory,when a change is brought in the organization, it requires tochange all the major components. People process factor, amajor component of organization, which encompassespractices designed to manage the acquisition of human talentand their employment outcomes, is to be reviewed in presenceof changes in organization demographics of workforce. Thusmanaging growth in workforce diversity and increasing therepresentation of minorities throughout the organization iscritical strategic human resource (HR) management issue formost organizations. Various initiatives are taken by organizations operating inIndia, to include diversity in the set of human managementpractices, guaranteeing an alignment between the strategies ofhuman resource and diversity management goals. Diversityinclusion needs to gain a strong foothold within India Inc.demonstrating inherent benefits for both employees andemployers.

**Diversity Management and its Dimensions**

Diversity is the industrialized world's perennial underdog. The increasing diversity of school neighbourhoods and workplaces presents an unrelenting demand for effective interaction amongdiverse people (Johnson and Packer, 1987). People's experience of diversity, conceptions ofdiversity management and ideals of diversity, matters because they address not only recruitmentbut what happens after the recruitment (Fiske and Lee, 2008). The global economy movesdiversity to the top of the agenda. Immigration, worker migration, and gender and ethnicdifferences continue to dramatically change the composition of the workforce which further complicated the diversity issue

(Barak, 2005). The organizational literature began emphasising the business case for diversity in the late 1980s(Cox and Blake, 1991). The businesses case predicted a range of benefits resulting from greater work force diversity within organizations (Konrad, 2003). Ely and Roberts (2008) reframediversity research froma paradigm that emphasises difference to one that emphasises relationships. They argue that relational approach highlight the personal, interpersonal, and

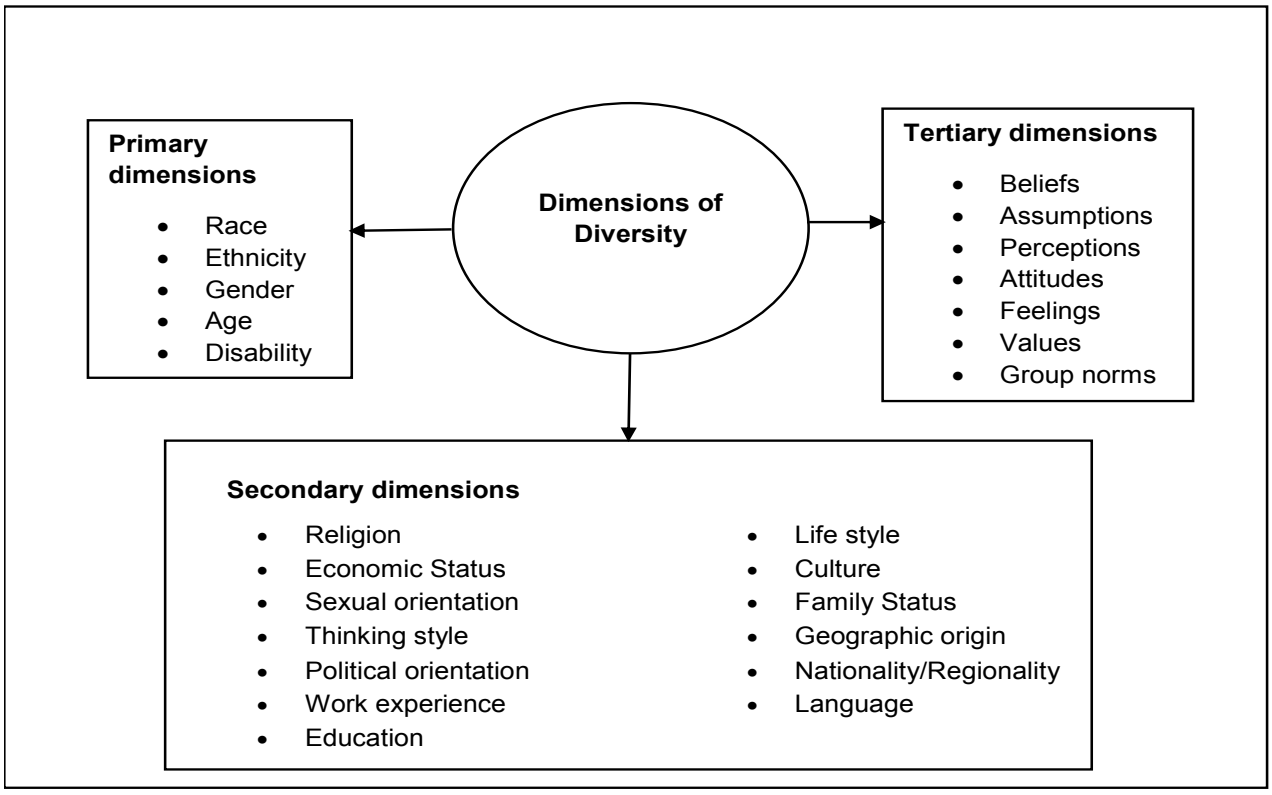


**Figure 1: Dimensions of Diversity, Adapted from Rijamampianina and Carmichael (2005)**

intergroup dynamics that influence how people interpret and act on their differences. From thisperspective difference can also be a source of creativity and resilience. Cultural diversity is a major issue in diversity management. Ely and Roberts (2008) definecultural diversity as differences

among team members in race, ethnicity, gender, religion, nationality, or other dimensions of social identity that are marked by a history of inter group prejudice, discrimination or oppression.

**Cost –Benefit of Diversity**

Diversity becomes most advantageous when the organization wants to expand its perspective, Strategy tactics, or approach, to reposition the organization, reposition strategy from a bricks andmortar to an e-commerce environment, launch a new product, create a new idea, develop newmarketing plan, design a new operation, or assess emerging trends from a new perspectives (Adler, 2002).It will lift morale, bring greater access to newsegments of the market place and enhance productivity (Thomas and Ely, 1996).Including uneven access to education and training as well as conscious and unconscious bias and assumptions (Fine and Handelsman, 2012).

**Job Areas with Strong Potential for Gender Diversification**

To facilitate the multiple potential benefits of greater work force diversification in the energy work-force, it is worth considering specific types of jobs. Three key job areas in the energy sector appear to have particularly strong potential for increased diversification: 1) engineers and technicians; 2) construction, installation, and manufacturing jobs; and 3) public- and private-sector leadership.

**Renewable Energy - India**

India has witnessed an exponential growth in renewable energy sector during the last few years. The gross installed capacity of grid interactive renewable power in the country stood at about 33.8 GW as on 31st December 2015 as shown in Table 1.1. As of December 2015, solar, wind, biomass and small hydropower contribute about 13.60 per cent of the total installed capacity for electricity. Renewable energy has been witnessing over 20 per cent growth in the last five years.

In addition to gender-specific matters, the general value of equality is important (Wilkinson & Pickett, 2009) and researchers, politicians, and the public increasingly recognize the social dangers of growing inequality (Stiglitz, 2013). Decades of research on diversity in groups, firms, schools, and society demonstrates that diversity strengthens organizations, communities, and entire sectors (Page, 2008).

**Table 1 Grid – Interactive Renewable Power**

| Sr. No | Renewable Energy Source | Installed Capacity (MW) | India's position in World |
|---|---|---|---|
| 1. | Wind | 25088.19 | Fifth |
| 2. | Small Hydro | 4176.90 | Fourth |
| 3. | Solar PV | 1119.76 | Fifth |
| 4. | Biomass Power (Agro residues) & Cogeneration – Bagasse | 4550.55 | Seventh |
| 5. | Waste to Energy | 127.08 | |
| | Total | 38821.59 | |

Source: MNRE Achievements as on 31.12.2015 – http://mnre.gov.in

India is a leader in wind, biomass and solar PV sectors and ranks among the top ten countries of the World in renewable energy. India is the only country in the world which has a dedicated Ministry for Renewable Energy (Ministry of New & Renewable Energy, GoI), proactively creating an enabling environment for the sector to grow by rapidly bringing in innovative policy initiatives. The Ministry of New and Renewable Energy has revised its target of renewable energy capacity to 1,75,000 MW

till the year 2022, comprising 1,00,000 MW Solar, 60,000 MW Wind, 10,000 MW Biomass and 5,000 MW Small Hydro. The country is well poised to facilitate and advance the growth of renewable energy and enable become one of the world leaders in all sectors of renewable energy in the coming years.

**Renewable Energy - Maharashtra**

Maharashtra occupies the western and central part of the Country and is the second largest state in India both in terms of population and geographical area (3.08 lakh sq. km.). The State has a population of around 11.24 crore (Census 2011) which is 9.3 per cent of the total population of India. The State is highly urbanized with 45.2 per cent people residing in urban areas.Maharashtra is the largest power generating state in India with an installed capacity of 40613.69 MW as on 30.09.2016.. For the development of Renewable Energy in the State of Maharashtra, various Incentives have been declared from time to time to create installed capacity through projects of different sources of renewable energy.

Table 2. Overall Target set by Government of Maharashtra vide its Policy dated 20th July 2015 during the period of Five years ending on 19th July 2020.

| Renewable Energy Source | Target Capacity Addition |
|---|---|
| Wind | 5000 MW |
| Small Hydro | 400 MW |
| Solar PV | 7500 MW |

| | |
|---|---|
| Biomass Power (Agro residues) | 300 MW |
| Waste to Energy | 200 MW |
| Cogeneration – Bagasse | 1000 MW |
| Total | 14,400 MW |

The total renewable energy installed capacity in the State till Oct 2016 was 7348 MW.

Table 3: Grid – Interactive Renewable Power (State of Maharashtra)

| Sr. No | Renewable Energy Source | Installed Capacity (MW) |
|---|---|---|
| 1. | Wind | 4661.9 |
| 2. | Small Hydro | 292.52 |
| 3. | Solar PV | 365.75 |
| 4. | Biomass Power (Agro residues) & Cogeneration – Bagasse | 215 |
| 5. | Waste to Energy | 34.71 |
| | Total | 7348.7 |

Source: MEDA Achievements as on 31.10.2016 – http://meda.gov.in

As per the report issued by Ministry of New and Renewable Energy (MNRE) and the Confederation of Indian Industry (CII) in 2010 the approximate distribution of manpower across different functional areas of operation in the Wind Energy Industry is provided below:

Table 4: Estimated employment distribution across various functional areas(approximate)

| Type of | Employment | Functional Area of | Percentage of People |
|---|---|---|---|

| Employment | | Operation | Employed (%) |
|---|---|---|---|
| Direct | 14,000 | Manufacturing | 20 |
| | | O & M | 25 |
| | | Project Development | 30 |
| | | Marketing | 25 |
| Indirect | 28,000 | | |
| Total | 42,000 | | 100 |

**Panama Wind Energy Godawari Private Limited Way of Work force Non Discrimination & Equal Opportunity at Work Place**

For the purpose of our research we choose the period during which Panama Wind Energy Godawari Private Limited (Panama) an Independent Renewable Power Producer was Constructing an 80 MW Wind Power project in the State of Maharashtra at Site: Mirkala in District Beed. Panama Wind Energy Godawari Private Limited is an Integrated Management System compliant Organisation having certified for ISO 9001:2008, ISO 14001:2004, ISO 180001: 2007. The 80 MW Wind power project at Site: Mirkala, Tal: Georai, Dist. Beed, Maharashtra, is exceptional in many ways. Located in the heart of Deccan plateau, which is always chronically short of drinking water and electricity, Mirkala project is the only wind power project in the region which is since 2014 providing clean energy.

As Panama is a global innovative and project organization, its key resource to manage diversity is in accordance with the Principles of Performance Standards on Environmental and Social Sustainability

issued by International Finance Corporation. (IFC). The policies adopted by Panama in accordance with these IFC Standards were reviewed and they were:

- At Panama, it is recognized that creating a diverse, inclusive work environment is a journey ofcontinuous renewal. Each step in the process has an important significance to remember as itmoves forward into the 21st century. Together the steps create a diversity value chainupon which it is building its winning global workforce and workplace.
- **80 MW Wind Power Project attributes**:

| **Attribute** | **Details** |
|---|---|
| Capacity | 80 MW Wind Power Project |
| Number of Wind Turbine Generators (WTG) | 40 Nos. |
| WTG Capacity | 2 MW each |
| Land required for the Project | 350 Acres |
| Expected Annual Energy Generation | 150.20 GwH |
| Plant Load Factor (PLF %) | 21.4% |
| Employment Generated during the Project Construction | 5835 Man Days |
| Employment Generated during Operation each year | 1948 Man Days |
| Power Purchase | Maharashtra State Electricity Distribution Co. Ltd (MSEDCL) |
| EPC Contractors | Gamesa Renewable, Spark Electro Consultants and GR Greenlife |

| | |
|---|---|
| Estimated Life Span of Project | 20 Years |

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- Analysis of the Man Days employed during the Construction & first year of the operation of the Wind Power Project:

| Year | Man Days |
|---|---|
| 2013 | 223 |
| 2014 | 3697 |
| 2015 | 1915 |
| 2016 | 1948 |
| Total Man Days | 7783 |

**Estimates of Employment Generated Across Each Phase of Construction**:

- **Wind resource assessment**: Construction of a wind farm restson this strong foundational step. Wind resource assessmentrequires setting up tubular wind monitoring masts (equippedwith anemometers, wind vanes, and data loggers) to recordwind speed, direction, density, and other climatic conditions for two years. The two-year data on local wind conditions arecrucial to a feasibility analysis of the selected site. Panama hired skilled external agents to negotiate land deals, frame lease agreements, and facilitate the final purchase of land required to set up three wind monitoring masts. The company deployed two in-house skilledsupervisors and four semiskilled staff to install the wind masts. It also

engaged local people as security personnelto oversee the masts for two years, two for each mast .Two additional Panama employees were involved fullti mein recording wind resource data for two years on a continual basis.

**Summary of Work Force Diversity as per the Primary Dimensions**:

**A. Gender**

| Gender | Number of Employees |
|---|---|
| Male | 496 |
| Female | 4 |
| Total | 500 |

**B. Age**

| Age Groups (Years) | Number of Labours |
|---|---|
| Above 18 -Below 20 | 8 |
| Between 20 – 40 | 486 |
| Above 40 | 6 |

**Work Force Diversity as per the Secondary Dimensions:**

**A. Regionality**

| **Region** | **Numbers of Labours** |
|---|---|
| North India | 10 |
| Western India | 280 |
| Central India | 50 |

| | |
|---|---|
| Southern India | 140 |
| Eastern India | 20 |

**B. Religion**

| Religion | No of Employees |
|---|---|
| Hindu | 474 |
| Muslim | 15 |
| Christian | 2 |
| Sikh | 9 |

## Conclusion & Recommendation

Although Panama has tried to adapt diversity management and to createcultural synergy in the work place, still it has room for improvement. The socio-economic & cultural scenario prevailing in the Country impose limiting factors for Women participation in Renewable Projects. Managing diversity itself isa complex phenomenon. Systematic collection and distribution of data on gender in the energy work-force will encourage greater awareness about gender equity, support opportunities for women's advancement, and highlight the multiple benefits of hiring and advancing more women. Increase in participation by Women in energy-system change and energy transitions to renewable will encourage positive change in multiple ways including harnessing new opportunities for a more inclusive and innovative renewable energy industry.

The following hypothesis emerges from this initial exploration of the social-change potential of greater gender diversity in renewable energy. Enhanced gender diversity among those involved in shaping renewable energy systems will accelerate both social and technical change in the renewable energy-system transition. We propose that increasing work force diversity in energy-decision making will influence to encourage a more sustainable society. More research is needed to further explore this hypothesis and our proposition.

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