Diversity and Inclusion in the Geothermal Community: Beginning the Journey of a Thousand Miles

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ABSTRACT

Clean energy is attracting some of the brightest, most passionate, and best-trained members of the 21st-century workforce. Despite the attractiveness of the energy sector, there is a lack of diversity in the energy sector, with the situation being worse in some industries than others. This diversity can come in many forms. It can refer to race, gender, sexual orientation, age, religion, socioeconomic background, able-bodiedness, etc. Most organizations and professional bodies have begun acting on diversity, equity, and inclusion (DEI), from the private sector to industry, academia, and governments.

As the global leader for geothermal energy advancement, Geothermal Rising (GR) is leading the conversation in the transition to a more diverse and inclusive community, determined to contribute toward a more equitable society. In 2021, Geothermal Rising set up a DEI task force that had the objective to lead the discussion on DEI, develop the DEI statement, and put together a framework on which DEI can be fostered to provide a sense of belonging within the geothermal community and beyond. A baseline was needed to develop a DEI strategy for Geothermal Rising and the geothermal community. This baseline was done via an initial survey of the geothermal community to understand the demographics.

This paper discusses the baseline data established with the initial survey and other accomplishments of the DEI task force from the first year, including having the most diverse board of directors in its history. We share the roadmap to developing Geothermal Rising's DEI near-term and long-term strategies, which include creating awareness, engaging more with the community, and recognizing DEI efforts, just to mention a few. We also share insights from the initial survey and how it informed the next steps that would position the geothermal community to reap the benefits of encouraging DEI initiatives.

1. Introduction

In recent years, awareness of and interest in diversity, equity, and inclusion (DEI) have increased. The eXtension Organizing Committee on diversity, equity, and inclusion (2020) define diversity as the presence of differences that may include race, gender, religion, sexual orientation, ethnicity, nationality, socioeconomic status, language, (dis)ability, age, religious commitment, or political perspective. Diversity also includes populations that have been and remain underrepresented among practitioners in the field and marginalized in the broader society. The eXtension Organizing Committee on DEI further defines equity as promoting justice, impartiality, and fairness within the procedures, processes, and distribution of resources by institutions or systems, while inclusion is described as an outcome to ensure those that are diverse feel and/or are welcome.

DEI is a global issue and can be linked to several of the 17 Sustainable development goals identified by the United Nations (2015), directly relevant to Goal 5-Gender Equality and Goal 10-Reduced Inequity, and indirectly to Goal 7-Affordable and Clean Energy, Goal 13-Climate Action, and almost to all of the other goals. Furthermore, the DEI is critical to the United Nations initiative "Transforming our World: The 2030 Agenda for Sustainable Development", where the emphasis is on people, planet, prosperity, and partnership, all of which can be transformed if DEI is implemented by every individual (UN, 2015).

A growing body of research indicates that diverse and inclusive teams outperform their peers, with a positive correlation observed between gender diversity in executive teams and measures of financial performance (Hunt et al., 2018). A study by Bourke (2016) establishes that a company with a diverse and inclusive workforce is two times likely to meet its financial targets, three times likely to be high-performing, six times likely to be innovative and agile, and eight times likely to achieve business outcomes. The energy sector is considered to have a diversity problem, with women accounting for 32% of the global energy sector workforce, racial and ethnic minorities accounting for 22%, and Black and Latinx individuals being under-represented compared to the population (OGV Energy, 2021). These results do not differ from the U.S. Labor Force Demographics of 2020 (E2, 2021), where 27% of the energy workforce are women, and 74% of the total energy workforce is white. The clean energy sector, which is a sector with increasing job growth, also faces a similar problem (E2, 2021). Successfully attracting and retaining a diverse workforce has never been more critical for companies. Millennials, for example, see inclusion as a mandatory part of corporate culture, defining how the company listens to them at work (Deloitte Touche Tohmatsu Limited, 2014). In a recent survey, 83% of Gen Z candidates (who will make up to 37% of the incoming global workforce) said that a company's commitment to diversity and inclusion is important when choosing an employer (Monster, 2021). Hence, organizations that hope to attract and retain the best and brightest talents would need to emphasize DEI efforts.

Most recently, during the "Great Resignation," most employees cited that they had left their companies because they did not feel a sense of belonging. PricewaterhouseCoopers (2021) conducted a multi-year, cross-industry survey and found that 80% of leadership engagement on DEI remains at the basic or emerging levels. While leadership says DEI is a priority, they are not taking the necessary steps to promote a culture of inclusion and diversity. A sense of belonging and feeling valued as a contributor are keys to employees' and organizations' effectiveness. Employee retention relies heavily on inclusion in the workplace.

Geothermal energy constitutes one of the clean energy resources. Geothermal technologies have been around since the beginning of the 1900s, but the last six years have witnessed extraordinary growth, with the sector projected to be 13 times bigger by 2030 (EGEC Geothermal, 2021). The geothermal energy sector suffers similar diversity problems as other energy sectors. A study by Christopherson et al. (2021) comparing the percentage of females in the energy sector over 10 years (2010 to 2019) showed that females in the geothermal industry made up less than 20% of the workforce, lower than the oil and gas, wind, solar, hydropower, and nuclear sectors, and only surpassed the mining sector marginally.

Geothermal Rising, the global leader for geothermal energy advancement, has begun advocating for a transition to a more diverse and inclusive geothermal community. In 2021, Geothermal Rising set up a DEI task force that had the objective to lead the discussion on DEI, develop the DEI statement, and put together a framework on which DEI can be promoted. A baseline was needed to develop a DEI strategy for Geothermal Rising and the geothermal community. This baseline was done via an initial survey of the geothermal community to understand the demographics.

This paper discusses the baseline data established with the initial survey and other accomplishments of the DEI task force from its inception. We share the roadmap to developing Geothermal Rising's DEI near-term and long-term strategies and how insights drawn from the initial survey informed some plans that would position the geothermal community to reap the benefits of supporting DEI initiatives.

2. Methods

2.1 Data gathering

The data presented in this study were compiled using surveys designed by the Geothermal Rising DEI task force. The survey was shared among all members of Geothermal Rising (consisting of 837 members) and across Geothermal Rising social media platforms.

The first survey was a baseline survey taken in 2021 to understand the demographics of the geothermal community. We also solicited ideas on how to advance DEI within the geothermal community. We gave open-ended questions to allow participants to express themselves beyond the limits of the options provided in the survey. The second survey was administered in 2022 to verify the demographics of the baseline survey. Survey responses were collected during the membership renewal process when members processed their renewal.

2.2 Organization of the results

The paper is organized as follows: first, we present the demographic information of the surveys. Then we share and discuss members' perceptions of DEI in Geothermal Rising events and in the geothermal energy workplace. Subsequently, we share Geothermal Rising's near-term and long-term strategies to tackle the challenge of low diversity. In addition, we share Geothermal Rising's DEI accomplishments year to date (YTD-2022) and what we hope to achieve in the years to come.

3. Results and Discussion

3.1 Demographic Data

411 people responded to the first survey, while 441 people responded to the second survey. The first survey results are the basis for the near-term strategies by Geothermal Rising to create an inclusive environment in Geothermal Rising events.

Figure 1 shows the age group of the survey respondents. Figure 1a shows the percentages of respondents' age group for the baseline survey in 2021, while Figure 1b shows the percentages of respondents' age group for the second demographics survey in 2022. From Figure 1a, more than 50% of the survey respondents were in the 25 to 44 age group. The next largest age group that responded to the baseline survey was the 55-64 age group. From Figure 1b, we see that 25% of geothermal energy community members who responded to questions on demographics are in the 65+ age group.



Figure 1: Age group of survey respondents. Figure 1a gives the percentages of respondents' age group for the baseline survey in 2021, while Figure 1b shows the percentages of respondents' age group for the second demographics survey in 2022.

Figure 2 shows the breakdown of the 2021 survey respondents by ethnicity. We used a bar chart to represent this information as respondents had the option to choose more than one ethnicity. With the 2022 survey (Figure 3), the possibility of selecting more than one ethnic group was not available. This might explain the relatively larger number of respondents who chose "Prefer Not to Answer" compared to the 2021 survey.



Figure 2: Breakdown of survey respondents by Ethnicity – GR DEI 2021 survey.



Figure 3: Breakdown of survey respondents by Ethnicity – GR DEI 2022 survey.

In Figure 4, we show the numbers of respondents by gender identity. Note that Figure 4 is not drawn to scale but is used to indicate the interconnectedness of responses by the respondents. In the 2021 survey, respondents could choose more than one gender identity. On the other hand, in the 2022 survey, respondents could only select one gender identity; hence, we present the demographic in a pie chart, as shown in Figure 5.



Figure 4: Gender identity by the numbers – GR DEI 2021 survey.



Figure 5: Gender identity by the numbers – GR DEI 2022 survey.

We sampled the population to identify what percentage of respondents had dis(ability) or accessibility needs, followed by a question on what Geothermal Rising could do to alleviate the needs (the open-ended question was only available in the 2021 survey). In the 2021 survey, only

a yes or no option was provided, whereas, in the 2022 survey, respondents were given the flexibility not to comment on their dis(ability) / accessibility needs. From the 2021 survey, we determined, from the 7% of respondents with disability/accessibility needs, that the dis(ability) / accessibility needs covered physical, sensory, intellectual, emotional, developmental, and pervasive developmental needs.

In the 2021 survey, we gathered information about the sexual identities and orientations of the respondents. The results are shown in Figure 7.



Figure 6: Dis(ability) and accessibility needs of survey respondents. Figure 6a gives the percentages of respondents' dis(ability)/accessibility needs for the baseline survey in 2021, while Figure 1b shows the percentages of respondents' dis(ability)/accessibility needs for the second demographics survey in 2022.



Figure 7: Sexual identity/orientation of survey respondents from the baseline survey in 2021.

3.2 Members' Perception of DEI in the Geothermal Industry

In the second part of the 2021 survey, we gathered information on how members of the geothermal energy community perceive diversity, equity, and inclusion in Geothermal Rising events and in their places of work. We did not gather this information in the 2022 survey. From the 2021 survey, while most of the survey respondents rated Geothermal Rising from 3 - 5 (Neutral to Strongly Agree) on diversity, equity, and inclusion, the bulk of the respondents rated 3 (Neutral), which is not very descriptive. The responses are shown in Figures 8 and 9, with Figure 9 being the responses of those who identify as black, indigenous, and people of color.



Figure 8: How survey respondents perceive diversity, equity, and inclusion in Geothermal Rising.



Figure 9: How the black, indigenous, and people of color perceive diversity, equity, and inclusion in Geothermal Rising.

DEI in the science, technology, engineering, and math (STEM) fields and renewable energy employment settings are discussed at various times. However, there is minimal corresponding discussion concerning events. Participation in meetings is crucial for career advancement in the STEM field, but issues like harassment, a common occurrence at meetings, limit participation through effects on attendees' behavior and ability to learn (Marts, 2017). To understand how Geothermal Rising events have been up until 2021 and how Geothermal Rising could improve their events further, we gathered information on how the survey respondents have felt during Geothermal Rising events. Figure 10 shows the feedback from the survey respondents. 88.3% had not felt discriminated against during a Geothermal Rising event. The 4.1% that chose the option of "Prefer Not to Say" does not exclude the possibility of feeling discriminated against during a Geothermal Rising event.



Feeling of Discrimination at a Geothermal Rising Event

Figure 10: Survey respondents' feelings of discrimination during a Geothermal Rising event.

The survey respondents had the option to provide more information about their feelings of discrimination during Geothermal Rising events. Most of the feedback was centered around ageism, chauvinism, inappropriate identification and advances, mixed feelings about some of the locations chosen for the event, and inappropriate behavior of exhibitors. The feedback has guided some of the near-term Geothermal Rising strategies for future events (discussed in Section 3.3 of this paper).

We also gathered responses from survey respondents on their feeling of discrimination and/or harassment in their workplace. Figure 11 shows the statistics of respondents' feelings about discrimination and/or harassment in their workplace. Geothermal Rising has no control over organizations and hence can only share information about people's pain points and provide

guidance on improving DEI in the workplace. We hope that the information presented herein will be beneficial for organizations in planning their DEI strategies.



Figure 11: Survey respondents' feelings of discrimination and/or harassment at work in the geothermal industry.

From Figure 11, we see that almost a quarter of the survey respondents have felt some degree of discrimination or harassment in the workplace. For the male population, the main issues reported include ageism, racism, condescending remarks, an unconscious bias for physical appearance, and workplace politics. The main problems reported by the female population who felt discriminated against or harassed at work in the geothermal industry include sexism, ageism, and non-inclusive workplaces, especially on the well-site (including the absence of facilities for women and inappropriate images of women hung in workspaces on the well-site). Additional issues experienced by the female population include mansplaining, sexual harassment, being passed over for promotion and career development (especially once the woman has a child), hepeating (when a woman or nonbinary person suggests an idea and it is ignored, but then a man says the same thing and it becomes well-received), and not getting the recognition or respect deserved.

3.3 Geothermal Rising's Near-Term and Long-Term DEI Strategies

The Geothermal Rising DEI task force has been working on the organization's DEI near-term and long-term strategies. Table 1 lists the near-term plans that Geothermal Rising is taking to make events more inclusive. These plans were based on the feedback from survey respondents on Geothermal Rising events.

Issue (as reported by survey respondents)	Near Term Strategy
	Provide badges with name tags, affiliations, and
Misrepresentation of individuals	pronouns
Event location	Make current event locations safe
	Expand the nomination pool, create a DEI award, and
Lack of diversity in awards	provide clarity in the description of the award
	Provide a clear statement in forms exhibitors sign
Inappropriate behavior by exhibitors	with disciplinary actions for failure to comply
	Provide a means for participants to report
	anonymously any acts of discrimination or
Communicating inappropriate behavior	harassment
	Ask participants for accommodations during the
Disabilities and accessibility needs	event registration process

Table 1: Geothermal Rising's Near-term strategies to promote diversity, equity, and inclusion in events

The long-term strategies are based on the four cornerstones of Geothermal Rising's DEI Goals, as shown in Figure 12. Geothermal Rising seeks to achieve the following:

1. Awareness - Elevate awareness of diversity, equity, and inclusion in the geothermal community

2. Accommodations - Create a welcoming and inclusive environment for all within the geothermal community, Geothermal Rising organization, and events

3. Association - Engage with the geothermal industry to establish (support) improvement and encourage change

4. Accountability - Hold ourselves and the geothermal community accountable to commitments and improvements.



Figure 12: The four cornerstones of Geothermal Rising's diversity, equity, and inclusion strategies.

The long-term strategies constitute a work in progress and are listed in Table 2.

Торіс	Detailed Task	Deliverables
Metrics	Continuous GR member survey	
Metrics	GR member company surveys (on employee statistics)	Determine how geothermal companies are progressing with DEI
DEI Pledge	DEI Pledge statement for geothermal companies to sign and to be posted on the Geothermal Rising webpage	 Draft DEI pledge statement for geothermal company members to sign Send DEI pledge to geothermal company members for signature Update the webpage with links/logos of companies who signed a pledge
GR Awards	Determine award title, qualifications, requirements, and recipients (i.e., individual, corporate)	Request nominationsSeek sponsorship, award
Social Media Updates	Create and manage a closed LinkedIn group to support the Geothermal Rising LinkedIn and other social media accounts	 Create a social media group page Collect stories/input for posting to Geothermal Rising page
Webpage Updates	Update GR webpage to include DEI information, resources, statistics, etc., using interactive visuals and spotlighting DEI in the geothermal industry	-Include Strategic Plan on the webpage
DEI Strategic Plan	Create and follow a strategic plan for the DEI Task Force	 Draft DEI Strategic Plan DEI Task Force finalize and present DEI Strategic Plan to Board for approval Post online
Anti-harassment Policy updates	Review and update the anti- harassment policy for Geothermal Rising	
Conference Support	Support improving the safety of members at the conference	 Have hotel security or volunteer chauffeurs of GR members around the hotel (specifically at night) Update vendor contract language for DEI Update conference app with hotel security contact for easy access Encourage ride-sharing, buddy system in speech
Conference Support	DEI Panel/Presentations	 Identify goals of holding a DEI panel session Make a presentation on the DEI task force progress Pronouns line on nametags

Table 2: Geothermal Rising's long-term strategies to promote diversity, equity, and inclusion in events and the geothermal community

3.4 Geothermal Rising's Accomplishments Year-To-Date (YTD)

Geothermal Rising is a global nonprofit association for the advancement of geothermal energy through outreach, collaboration, and education with the vision of creating a brighter future for Earth and all its inhabitants, powered by the planet itself. The association's mission is to connect the geothermal community and champion geothermal energy in the United States and worldwide. Geothermal Rising has over 1,200 individual members and over 90 corporate members, including multinational companies, universities, research Institutes, government, and other non-governmental organizations.

3.4.1 Geothermal Rising Board of Directors

Geothermal Rising's Board of Directors thoughtfully and intentionally redesigned the board structure to encourage diversity by creating targeted representative seats (i.e., government, policy, utility, and consultant), beginning with elections in 2021.

Geothermal Rising announced its most diverse board of directors in the organization's 50-year history regarding gender, racial, and industry diversity leading into 2022. For the first time in the organization's history, Geothermal Rising would be led by a female majority, consisting of eight (8) out of the 14 presiding members.

3.4.2 Geothermal Rising's Diversity, Equity, and Inclusion Task Force

In 2021, Geothermal Rising established a Diversity, Equity, and Inclusion Task Force of volunteers to lead efforts and establish our community leadership, metrics, analysis, and guidelines. As one of its first tasks, the DEI Task Force wrote a DEI Statement that will continue to drive the Task Force strategy. The statement was approved and issued by the Geothermal Rising Board of Directors in May 2021.

"Geothermal Rising is committed to improving Diversity, Equity, and Inclusion to provide a brighter future for Earth and all its inhabitants. Our organization and community embrace and celebrate our members' differences¹. It is the responsibility of Geothermal Rising to encourage and promote diversity, equity, and inclusion. As a global geothermal nonprofit organization, we are committed to connecting the geothermal community. There is more work to be done and, as we expand across markets and internationally, Geothermal Rising will continue to seek equitable improvement to elevate the geothermal community."

Further, the DEI Task Force drafted a strategic plan to provide a framework by which the DEI Task Force members can continue advancing the organization and the industry's diversity, equity, and inclusion. The DEI Strategic Plan was approved and adopted by the Geothermal Rising Board of Directors in May 2022.

¹ Some examples of these differences include but are not limited to: race, creed, color, national origin, nationality, ethnicity, ancestry, age, sex (including pregnancy), family status, marital/civil union status, religion, domestic partnership status, affectional or sexual orientation, gender identity and expression, atypical hereditary cellular or blood trait, genetic information, liability for military service, and mental or physical disability, language, national origin, political affiliation, social-economic status, and other characteristics that make our members unique.

3.4.3 2021 Geothermal Rising Conference Opening Plenary Session

The Geothermal Rising DEI taskforce and Women in Geothermal (WING) were represented at the 2021 Geothermal Rising Conference Opening Plenary Session. During that session, preliminary results of the 2021 DEI survey were shared to create awareness among the community and share the forward plans of the DEI task force.

4. Conclusion and Way Forward

Geothermal Rising is on a journey to advance diversity, equity, and inclusion within the geothermal community. In this paper, we share the progress in gathering information about the state of diversity in the geothermal community, the existing issues, and how Geothermal Rising plans to tackle DEI within its abilities.

Some takeaways from the baseline survey include: -

- 1. Individuals' disability/accessibility needs in the geothermal community include physical, sensory, intellectual, emotional, developmental, and pervasive developmental needs.
- 2. Some Geothermal Rising events have not been discrimination and harassment proof.
- 3. Discrimination and harassment have been prevalent in the geothermal industry workplace. Individuals of all genders have experienced some form of discrimination or harassment. Individuals who identify as females have experienced a greater portion of discrimination and or harassment.

In order to improve any circumstances, an objective and data-driven assessment is the first step. This paper is part of the assessment that the DEI task force conducted on behalf of Geothermal Rising. The second step is to identify organizations that are successfully making changes in the DEI goals, and adapt some of the proven methods and actions we can take, and set ourselves for a successful journey of a thousand miles. The U.S. National Academies of science, engineering, and medicine (NASEM) summarized it eloquently during their workshop on Addressing Diversity, Equity, Inclusion, and AntiRacism in 21st Century STEMM Organizations, in July 2021: "A holistic approach including recruitment, mentoring, interaction through educational training, and mechanisms for social accountability are part of the solution" and "to fully understand and provide what is needed to ensure that the culture and environment within our institutions, workplaces, and organizations is diverse, inclusive, supportive, and devoid of bias". (NASEM, 2021)

Geothermal Rising has taken steps to advance DEI within the geothermal community and will continue to develop, implement, measure, and improve on the long-term DEI strategies.

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