

# **Power Relations and the Energy Transition: A Critical Review on Discourses, Ideologies and Perspectives for Sustainable Geothermal Energy Development in Valemount, British Columbia**

Nadine N. S. Abdelrahman

University of Alberta, 515 General Services Building, Edmonton, AB, T6G-2H1

sulimana@ualberta.ca

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## **ABSTRACT**

Geothermal energy is predicted to be most beneficial to rural communities where costs will be minimal and energy use will be direct, contributing to environmental sustainability while addressing equality and access to resources issues in many underprivileged parts of the world. Accordingly, geothermal energy is envisioned to have high potential for delivering renewable energy resources and supporting marginal regions through much-needed community development. Given the challenges in realizing this potential, this paper critically reviews the power relations within the energy sector, looking at control over resources, the accumulation of wealth, and the potential for structural transformation to a model of resource development that supports marginal regions and achieves community development. Specifically, we focus on several key questions. If the main driver of new technology/ development projects remains profit, how likely is it that geothermal energy will be developed to benefit rural and remote communities? What are the key challenges and mechanisms for supporting community development in this context? Adopting a critical discourse analysis approach, I examine relevant literature to identify dominant discourses that prevent sustainable energy development in rural communities. Through this research I seek to understand the cultural context of energy companies and their relationship to people and profit as well as social and environmental sustainability. This review is a preliminary stage of a participatory action research study on the potential for geothermal energy development in the Canadian Village of Valemount to incorporate sustainable, collaborative and inclusive resource development models. Furthermore, this study facilitates the development of a theory and concepts for understanding the sustainability of renewables and their projected impact on solving equity and equality issues worldwide.

## **1. INTRODUCTION & BACKGROUND**

The transformation of the relationship between humans, natural resources and the biophysical environment that occurred with the rise of the industrial revolution had drastic impacts on life on earth. Resource development grew and continues to evolve significantly, accompanied by wealth creation and improved quality of life, for some. However, for the majority of the world's population, this has not been the case. Practices and structures mobilized by resource developers, corporations, and financial institutions have created atrocities that not only impeded promised, prosperous community development but led to social, economic, and environmental inequalities (Forsyth et al., 2007; Geels, 2014; Gailing, 2016; Cederlöf & Kingsbury, 2019; Suliman, 2019). Although it took tremendous time and effort for those in control of resources to acknowledge natural limits to growth and development, it is now uncontested that business-as-usual is not an option (Lösch & Schneider, 2016). The vision of sustainability is widespread yet remains an unreachable and challenging goal as inequality rises, and projects continue to overlook important socio-economic factors vis-à-vis environmental limits, modes of development that meet the needs of individuals and communities worldwide.

The negative impacts of extractive industries and corresponding systems of power, such as the oil and gas sector can no longer be denied or ignored. Such impacts have accumulated over decades, oppressing individuals, communities, in some cases, populations as a whole and on a larger scale, the earth's atmosphere (Cederlöf & Kingsbury, 2019). From negative health impacts to social inequalities, the sector can be seen as one of the top contributors to anthropogenic climate change and its associated risk imbalances and uncertainties across the globe. The aforementioned systems are commonly intertwined processes of complex relationships governed by a few in "power" who dictate resource allocation, access and control (Suliman, 2019). Additionally, regulatory systems remain in favor of well-established development mechanisms and processes as opposed to newer, untraditional and potentially sustainable yet uncertain trajectories (Shaw et al., 2015). Empirical evidence supports these claims, where, for example, in Alberta (AB), Canada, the "Big Five" corporations in the oil and gas sector control about 79% of resources and 90% of upgrading capacity (Hussey et al., 2018). As will be discussed further, this example demonstrates the entanglement of power relations of the energy sector and between private actors and policy outcomes.

Renewable developments remain a niche and are constantly faced with institutional resistance (Geels, 2014). Power relations are a crucial dimension of this study as they are seen to constitute the core of unsustainable development and its associated impacts of inequality and injustice (Geels, 2014; Cederlöf & Kingsbury, 2019). At the same time, deconstructing these power relations from an intersectional lens, has the potential to transform outdated practices and processes to serve the greater good (Avelino & Rotmans, 2009). Not only is it essential to transform power relations and dynamics of renewable energy developers, but more importantly, we must turn to current fossil-fuel based energy developers to ensure buy in and limit resistance (Geels, 2014).

The general goal of this review is to contribute to the literature on the long-term goals of energy corporations in lights of climate change, resource depletion and unprecedented inequalities. Since it is impossible to address this goal fully with all its interconnected issues and topics, I plan on narrowing it down to specifically look at the complexities of the young but growing field of geothermal energy development in Canada. As a new and burgeoning sector in Canada, geothermal development has the potential to overcome

several of the overlooked impacts of the oil and gas sector (or the fossil fuel industry as a whole), not only environmentally but also socially and economically.

Renewable energy sources such as geothermal heat energy have surpassed the initial research and design phases in many places around the world. The technology has started to come to life in different parts of the world and developers are optimistic about its sustainable application. Geothermal energy in Canada has not yet reached the implementation phase but technology developers continue to build collaborations and design projects in suitable areas (e.g., Hinton, AB; Valemount, British Columbia (BC)). Project proponents are highlighting the sustainable potential of this technology on a large scale and its envisioned role in contributing to community development; including addressing imbalanced wealth distribution and unjust access to/ control over resources. At this early stage, details on the feasibility of the planned and proposed benefits are still unavailable and relevant power relations remain unclear. However, associated economic growth plans are seen as the key to solving most of the issues faced by residents. The proposed plans are projected to greatly contribute to the local economy through rebranding the village as a tourist destination, creating jobs, attracting commercial and retail businesses, and all as a result of availing a free/ low-cost energy supply that can sustain current and future needs and activities.

Drawing on insights from other technologies, there has been energy management initiatives that address several of the concerns mentioned earlier and empower communities to have a sustainable and fruitful direct relationship with resources. For example, community energy projects are growing in popularity, involving grassroots initiatives in an attempt to decentralize energy management, reduce carbon emissions from traditional energy sources and contribute to a sustainable energy transition (Denis and Parker, 2009; Hargreaves et al., 2013; Van der Schoor & Scholtens, 2015; Thomas et al., 2018; González et al., 2019). However, there remains a high degree of social, political and institutional challenges facing these initiatives (Hargreaves et al., 2013; Thomas et al., 2018). This is not to discredit the immense efforts conducted around the globe, commonly led by communities/ the public, that push for institutional and structural change in energy development and management (Denis & Parker, 2009; Devine-Wright, 2012; Hargreaves et al., 2013; Orehounig et al., 2014; Koirala et al., 2016; Becker et al., 2017; González et al., 2019). Such initiatives are a valuable indication that transformation has already started and that dominant world systems and power relations that exist today will eventually be restructured.

This review study is seen as an essential component of research on the potential for geothermal energy in Canada, specifically Valemount, BC, to positively contribute to community development while addressing socio-economic inequalities. In order to develop a comprehensive case study of the potential impacts of the proposed development in Valemount, I aim to identify, deconstruct and analyze the discourse revolving around resource towns and energy production and the intertwined power relations throughout. I rely on literature of resource towns that witnessed booms as a result of local energy generation sources, mainly in the Mackenzie Basin (Bone, 1998; Leitch et al., 2019). The main concern for the village of Valemount, or similar energy explorations in small towns is that they would follow the classic life-cycle of resource towns as documented by Lucas (1971). This life-cycle consists of the initial development phase of the town, followed by the close control of the developers over the town's administration, the restructuring of the town's administration through elections and finally, the out-migration of younger generations due to the lack of sufficient employment opportunities (Lucas, 1971; Bone, 1998). Others have discussed additional phases to this life-cycle that pertain to the closure of the resource extraction activities (Bradbury & St. Martins, 1983).

Geothermal energy is categorized as a renewable resource, and hence is able to avoid several of the challenges of finite resources such as oil or coal, among others. However, it is still imperative for the village's current residents as well as incoming developers to fully comprehend and incorporate current social structures and dynamics. Through analyzing, comparing and contrasting the discourse on resource development and power relations, I aim to develop an analytical framework and recommendations that will assist my subsequent study on how stakeholders in Valemount, local community being the focus, can maximize the social benefits of geothermal energy development. Through a collaborative, participatory identification process of social parameters and needs of the people of Valemount, stakeholders will be better able to avoid outdated and redundant models that are filled with challenges that may prevent the village from benefiting from this resource development project.

## 2. RESEARCH METHODOLOGY

The approach of this review lends itself to critical discourse analysis (CDA) that facilitates the process of unpacking the relationship between the main project stakeholders including the local community, local government and the project developer/ owner as documented in the literature. Through a critical discourse lens, I argue that sustainable energy development models are threatened by the discourse of conventional power relations that influence strategic decision making in spite of public interests, views or needs and fosters resistance to change. Such a discourse prioritizes action in favor of fossil-fuel developers who are accountable to and simultaneously influential over government policies and regulations. It is worth noting that the main issue lies within the misalignment of needs and priorities amongst stakeholders including, but not limited to, communities and governments. I will investigate this argument with the aid of previous established case studies of resource towns in Canada or elsewhere. The purpose is to uncover whether this discourse will be replicated in Valemount or whether it has been consciously transformed and the developers and relevant government authorities are aware of the local needs and plan to incorporate them into their project phases and proposed outcomes.

Since this is review paper with the goals of establishing a pathway for further research and analysis, I focus on analyzing secondary material such as peer-reviewed journal articles, books, other publications including but not limited to government announcements, company reports and websites. Accordingly, data will be analyzed from a CDA lens, however, it is worth noting that this study will not represent a full CDA study. CDA will only be relied upon to highlight important patterns, gaps, comparisons and analyze potential rationales to build upon in subsequent studies.

CDA will facilitate the process of deconstructing notions of "power relations", "resource distribution and control", "stakeholder participation", "meaningful participation", among others to uncover their potential to contribute to sustainable resource development on community level and beyond. CDA's interdisciplinary nature and the established evidence of the impact of discourses on inequality and the reproduction of social dominance (Blommaert & Bolcaen, 2000), align with the goals and foundations of this research. As a framework, CDA allows the researcher to understand how discourses develop through critically analyzing information from various

sources and contexts (van Dijk, 2001). This review will also include theoretical concepts of transition management (Avelino & Rotmans, 2009; Wittmayer & Loorbach, 2016) to understand relevant discourses and critically analyze them.

The main component of the review that follows includes a discussion of the foundational concepts and frameworks that govern the analysis. The discussion continues to elaborate on findings in the literature. Different cases elaborating on the argument are presented and analyzed. The conceptual unpacking prior is essential for argument development as well as conveying the researcher's preconceptions, conscious and unconscious bias as well as general approach and interpretations. To conclude, implications of the findings and their contextual interpretations are presented followed by a brief summary and rationale for further research.

### 3. EVIDENCE & DISCUSSION

In order to establish a theoretical context for this review, it is essential to interpret a few of the foundational concepts of the argument. Transition management theory is a growing, interdisciplinary field of studies that involve the dynamics of structural change across social, economic, political and environmental axes (Avelino & Rotmans, 2009; Geels, 2014; Avelino & Wittmayer, 2016). Transition theory involves understanding the interactions between actors, structures and practices and the resulting intertwined relationships and complex outcomes. Power, although it remains an understudied concept, is a critical theme within transition theory that implicitly encompasses social, economic, political and environmental processes (Avelino & Rotmans, 2009). The discourse of energy development argued for here will involve deconstructing power and power relations from the evolution of transition theory lens.

Power relations within energy systems are described in many ways and mostly include socio-technical aspects that link the material and human/ social capitals (Palm, 2006; Avelino & Rotmans, 2009; Gailing, 2016). Power is also seen to encompass professional knowledge, influence, resourcefulness and authority. Although some limit the interpretation of power to specific actors and their interests, I rely on a more thorough understanding of power. This understanding views power "as a collectively produced force that is simultaneously inscribed in new socio-material configurations" (Gailing, 2016, p. 244). Accordingly, power from this perspective is relational and encompasses social and cultural contexts. It is not necessarily the question of who holds greater power that will be discussed, but rather, what institutions, structures or relations have been produced as a result of power relations in the energy transition and how do they affect different discourses within communities/ societies.

The dominant discourse within energy development centralizes power within governance and development actors and structures and their interests/ needs - often at the expense of communities and supposed beneficiaries (Palm, 2006; Thomas et al., 2018). This business-as-usual approach is known to be highly resistant to change, creating tensions between social needs, economic realities and political agendas and more often than not silencing opposing views to the dominant discourse (Palm, 2006; Thomas et al., 2018; Rocher & Verdeil, 2019). As mentioned earlier, power relations within this discourse are highly intertwined networks within social, economic and political arenas. It is often the case that politicians and government regimes have stakes in energy development activities and in turn influence energy systems across levels of governance regardless of public views or local needs (Palm, 2006; Gailing, 2016; Rocher & Verdeil, 2019).

According to Cederlöf & Kingsbury (2019, p.125), intertwined power relations have had "deleterious effects on national social and political development" in Latin America. The complexity of such power relations, their historically nested nature and inconspicuous assemblages allowed for the legitimization of unsustainable development pathways. Cederlöf & Kingsbury (2019) utilize evidence from oil development to recognize the entangled webs within the discourse of energy development. In this context, they describe "energy as more than a particular commodity and rather as a phenomenon that structures social relations and establishes the horizons of political possibility" (Cederlöf & Kingsbury, 2019, pp.125-126), through power relations. Theoretically, the transition to renewable energy provides communities with an advantage due to its implied alternative forms of governance and decentralized energy management and production (Van der Schoor & Scholtens, 2015). On the contrary, empirical evidence does not align with such claims as the conventional discourse of energy production is still in place.

Transitioning to renewable energy sources and its associated social, economic, environmental and political benefits to communities around the globe is lagging due to the mechanisms of power that remain dominant across practices, institutions and structures (Van der Schoor & Scholtens, 2015; Rocher & Verdeil, 2019; Sæþórsdóttir & Hall, 2019). Research on renewable energy sector in the Netherlands has found that fiscal and national policies as well as the development plans of fossil fuel companies are major obstacles to the energy transition (Van der Schoor & Scholtens, 2015). Transforming these policies and plans is seen as a threat to recent investments and plans for non-renewable energy developments and subsequent strategic - yet unsustainable - national development. This provides a perfect example to the argument presented in this paper where power relations within fossil-fuel development led to the creation of a discourse that supports vested interests in business-as-usual approaches over transitions or transformation.

According to Rocher and Verdeil (2019), this misalignment of needs can also be seen in the case of Tunisia. Renewable energy development resulted in unexpected outcomes and highlighted the impact of power relations on controlling policy implementation that contradicts divergent stakeholder interests and elicits public resistance. Through a deconstruction of what they refer to as the dynamics of policy instruments, Rocher and Verdeil (2019) found that embedded power relations surface and are easily linked to different forms of resistance. In this particular case, the discourse of conventional power relations extends to exacerbate socio-economic inequality as it implicated more than financial damage to renewable energy proponents and led to public resistance. It is worth noting that examples presented here from different countries do not imply universality in contexts, but they are relied upon to critically present similarities in energy discourses and power relations.

The case of Iceland, as discussed by Sæþórsdóttir and Hall (2019), addresses the crux of this review where the misalignment of needs and priorities of different stakeholders poses serious conflicts to sustainability and development plans. This case is distinct as it incorporates conflicts of interest over sustainable solutions across sectors. The tourism sector is perceived to be negatively (although not steadily so) impacted by renewable energy developments whereas such energy developments are necessary to abide by carbon reduction goals (Sæþórsdóttir & Hall, 2019). Power relations in this case are not directly in favor of fossil fuel generation processes but remain in tension between perceived economic value over social or environmental value.

One of the main obstacles to the energy transition remains the pressure for innovative technologies such as renewable energy to fit within current management and production systems and empower social cohesion and decentralized processes (Van der Schoor &

Scholtens, 2015; Rocher & Verdeil, 2019; Sæþórsdóttir & Hall, 2019). The fear of disrupting current systems or notions of transformation further impede hopes of true sustainable development while negatively impacting social, economic and environmental issues. There are no formal mechanisms or processes in place for collaborative, participatory resource management. Current tools such as social impact assessments for example only work to reinforce existing patterns as they function as a tool to legitimize power within the discourse (Colvin et al., 2019). Renewable energy and its innovative management systems are commonly supported insofar as they align with the needs and interests of the dominant discourse (Palm, 2006; Rocher & Verdeil, 2019). However, communities around the world are gaining a stronger voice to communicate their needs and more power in support of the much-needed transformation vis-à-vis the energy transition and beyond (Palm, 2006; O'Faircheallaigh, 2013; Cederlöf & Kingsbury, 2019; Rocher & Verdeil, 2019; Sæþórsdóttir & Hall, 2019), paving the way for unprecedented, decentralized power.

Focusing on the Canadian context, several of the entanglements of power relations and the associated unsustainable discourse discussed earlier also reflects the reality on the ground (Hussey et al., 2018). The fossil-fuel industry remains a strong contender with influence over policy making and vested interest in maintaining business-as-usual, in spite of the industry's uncontested negative impacts (Carroll & Huijzer, 2018). It was found that the industry across the country is controlled by a small group of shareholders of different companies who, collectively, have common interests and control the sector's activities while exerting power on other stakeholders, including government agencies (Carroll & Huijzer, 2018; Hussey et al., 2018). Furthermore, financial institutions and their grand investments complement the growth of the fossil-fuel industry and overlook the country's need to transition into renewable energy as mandated by global agreements on battling climate change and inequality (Yunker et al., 2018).

Exploring power relations and transition management literature at this early stage of geothermal energy development in Valemount provides the advantage of harnessing the full potential of this renewable energy source in addressing underlying conflicts, divergent interests, tensions or inequalities that may arise. Many locations in Canada have been preliminary identified to hold great potential in harnessing geothermal energy; with higher capacity than current electricity generation from fossil-fuels in some areas (Leitch et al., 2019; Wilberforce et al., 2019). Evaluating the practical feasibility of geothermal energy development within Canada and its potential to benefit communities will rely on fully analyzing the economic, political and social contexts. Starting with discourse analysis, the identification of community needs, concerns and interests, unpacking proposed long-term resource management plans, to collaboratively working on aligning stakeholders' interests, plans and goals, much work remains to be done. Interdisciplinary research collaborations will provide the needed expertise to understand and interpret all facets involved (Thomas et al., 2018).

Transformation in dominant systems and discourses is seen as inevitable (Palm, 2006; Cederlöf & Kingsbury, 2019; Rocher & Verdeil, 2019; Sæþórsdóttir & Hall, 2019), however, it should not be regarded as a mere disruption. Rather, the required transformation should be regarded as a path towards more prosperity, equality and sustainability to favor all stakeholders. Especially in the case of geothermal energy, it has been established that overlaps exist between the oil and gas sector and proposed processes and mechanisms for geothermal energy development. Leitch et al. (2019) thoroughly analyzed the potential for oil and gas sector in the carbon-intensive Canadian province of Alberta to complement the transition to a low-carbon economy that is based on geothermal technologies. Their research indicates a high level of overlap in regulatory, political, technological and financial frameworks between the established oil and gas sector and the proposed geothermal developments. However, they also discuss the importance of regarding these frameworks as guiding foundations to be modified, tailored and transformed as needed to properly harness the integrated, diverse and sustainable benefits of geothermal technologies (Leitch et al., 2019).

It is believed that proper research into systems interactions and power relations can reveal harmony between the current dominant discourse and the energy transition/ sustainable development discourse (Leitch et al., 2019) – contrary to popular findings presented earlier. This further highlights the value of this review and its potential in guiding future research on the energy transition in Valemount, BC and beyond. Challenges and obstacles were found to exist in many cases around the world, yet proper analysis and critical investigations can yield synergistically productive results on the short and long terms and prevent geothermal development in Valemount from following the classic life-cycle of resource towns mentioned earlier.

This review provides important context for my subsequent phase of research that focuses on the geothermal energy development in the village of Valemount. I aim to investigate the potential for new technological advancements and the role of renewable energy in the energy transition on a smaller scale to intersectionally benefit the community in lights of persisting dominant economic approaches and regulatory systems. There is an overall weakness in academic research when it comes to addressing power relations. The interdisciplinarity and complexity of it along with the regulatory, spatial, temporal and financial limitations faced by researchers created a knowledge gap and an extra roadblock to aspiring researchers in this field. I aim to deploy interdisciplinary qualitative approaches and methods to this research study in order to establish a strong crosscutting foundation and framework for consecutive studies and future work on power relations and the energy transition. Through participatory action research techniques and innovations, I plan on engaging two of the main stakeholders to the energy transition; communities and project proponents. Participatory action research integrates local knowledge with social science expertise, strengthening the quality and reliability of data (Greenwood et al., 1993).

Engagement with communities and project proponents will constitute an analytical aspect and a research integration aspect. The analytical aspect addresses the theoretical foundation of this research in terms of unpacking power relations, resource development goals and accountability to sustainable energy transitions. This will be conducted in the form of in-depth interviews, focus group discussions and backcasting workshops. In parallel, I hope to engage project proponents in the advancement of research on transformations in resource ownership and control and wealth/ benefit distribution. I aim to address this through collaboratively exploring potential incentives that may present themselves to project proponents, especially those willing to lead the inevitable transformation/ transition. On the community side, I will work to empower and build capacities of local community organizations, where geothermal energy development is technically feasible, as aligned to their values, needs and desired role in the proposed local resource development plans.

#### 4. CONCLUSION

It is worth noting that pertaining issues require an inter/ trans-disciplinary lens as it lies at the intersections of many fields of knowledge production and expertise. The energy transition affects a complex and dynamic assemblage of actors, institutions,

technologies, practices and knowledges that is constantly evolving. Collaboration of researchers across various disciplines allow for integrated theoretical perspectives that have the power to uncover synergies and support sustainable transformation. The value of such interdisciplinary collaborations has been demonstrated in this review vis-à-vis power relations and the anticipated transition to renewable energy. Transformation is required across structures, systems, ideologies, and perceptions in order to develop an effective platform of complementary interests and needs going forward.

It has been established that the aging systems of governance and energy management globally are incapable of adopting sustainable trajectories if they continue to operate under the influence of power relations to maintain business-as-usual. Innovations in social, economic and political dynamics is as urgently needed as innovations in technologies, if not more, to support a smooth and inclusive transition that paves a brighter future while rectifying the challenges of the past. Collective action and the restructuring of power will contribute to ensuring all stakeholders are treated equally.

Expanding on and learning from the limited, yet thorough, research on this intersecting field has immense potential to contribute to shaping sustainable energy management communities around the world. The village of Valemount, BC is an optimal location with similar parameters and can develop into a model case study. The literature review conducted in this paper supports the argument that the dominant discourse in energy development prioritizes the interests of those in power despite broader needs and global considerations. In order to prevent the replication of this discourse with the proposed geothermal development plans in Valemount, the next phase of my research will involve collaborative work with main stakeholder groups to ensure structural changes align with the community's visions, needs and interests.

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