# An Examination of the Social, Legal and Political Factors that Impact the Permitting Process for Wind Energy Transmission Line Projects in Canada

by

Erin Dykstra

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Environmental Studies

in

Sustainability Management

Waterloo, Ontario, Canada, 2024

# Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## Abstract

In order to mitigate the effects of climate change, energy systems are undergoing a rapid transition from fossil fuels to renewable energy sources. Renewable energy is a core component of decarbonization and climate mitigation strategies, and wind energy is one of the fastest growing and most affordable sources of renewable power. However, locations in Canada with the best onshore wind energy resources are often remote and unserved or underserved by the current electrical grid. In order to support expanded deployment of wind energy in these locations, transmission lines must be constructed or expanded. While researchers have identified a lack of sufficient transmission infrastructure as one of the most significant barriers to increasing wind energy generation capacity, no study has thoroughly examined the factors that impact the permitting process of wind energy transmission line projects in Canada.

This thesis aims to fill this research gap by examining the social, legal, and political factors that impact wind energy transmission line projects in Canada. This research was composed of (1) a content analysis of transmission line permitting documents from a selection of Canadian provinces and the federal government, and (2) an online survey of professionals active in the transmission line permitting process, including energy producers, energy regulators, permitting authorities, private firms, and public policy professionals.

The results of the content analysis—which revealed that permitting documents do not include information about the factors impacting permitting decisions—and low participation rate in the survey indicate a lack of transparency in the permitting process, a finding which is in accordance with institutional theory and prior research demonstrating the difficulty of studying closed government processes. Statistical and descriptive analyses of the survey data revealed a complicated relationship between permitting processes, public policy, lobbying, and public opinion. These results align with public values theory, social license to operate theory, and prior research demonstrating the importance of public consultation and community acceptance for infrastructure projects, especially projects such as above-ground transmission lines and wind turbines that have a significant aesthetic impact on the surrounding community.

*Keywords*: wind energy, transmission line permitting, transmission infrastructure, energy transition, renewable energy

## Acknowledgments

I would like to thank my supervisor Professor Blair Feltmate for his support throughout this project, without which I would not have been able to complete this thesis. When I was panicking that my initial two methodologies did not produce usable data and I would not be able to complete my degree, Blair was patient and uplifting. He reminded me that research is an iterative process and if one method of solving a problem does not work, that just means it's time to search for a new approach. He also pointed out that no data is still good data because the evidence of absence is still evidence.

I would also like to thank my committee members Professors Neil Craik and Jeff Casello for their support and contributions, and Anastasiya Saparaliyeva for their support and accommodation.

This journey to complete this thesis was a long, arduous, and humbling process. I faced many setbacks and struggles, both personally and professionally. I am eternally thankful for the wonderful support system I have around me, who enabled me to continue working and not give up on myself or this research. I would like to thank my family and friends for their ongoing support, which was absolutely invaluable. I would specifically like to thank my parents, Brigitte and Roger, for their unwavering support, my friends Emily, Sam, and Alex for keeping me focused and always believing in me, and my trivia team for keeping me on my toes every Wednesday night.

This thesis is supported in part by funding from the Social Sciences and Humanities Research Council through the Canada Graduate Scholarships – Master's.

## Table of Contents

## List of Figures

# List of Tables

## List of Abbreviations

| | |
|---|---|
| ANOVA | Analysis of variance |
| CER | Canada Energy Regulator |
| CREA | Canadian Renewable Energy Association |
| DDDP | Deep Decarbonization Pathways Project |
| HVDC | High-voltage direct current |
| IEA | International Energy Association |
| IPCC | Intergovernmental Panel on Climate Change |
| kWh | Kilowatt hour |
| NGO | Non-governmental organization |
| NRC | Natural Resources Canada |
| OECD | Organisation for Economic Co-operation and Development |
| PTC | Renewable Energy Production Tax Credit |
| SDG | Sustainable Development Goals |

# Chapter 1. Introduction

## *1.0 Background*

In order to mitigate the effects of climate change, energy systems are undergoing a rapid transition from fossil fuels to renewable energy sources. Renewable energy is a core component of decarbonization and climate mitigation strategies (Deep Decarbonization Pathways Project [DDPP], 2015). As proof of the importance of renewable energy in decarbonizing the energy sector, newly released data from the European Union's Emission Trading System shows that the most significant reductions in carbon emissions associated with energy generation is the decarbonization of energy through the expansion of renewable energy such as wind and solar (Directorate-General for Climate Action, 2024).

Wind energy is of particular importance and interest because it is one of the fastest growing and most affordable renewable energy sources. Globally, wind power is second only to hydropower in terms of installed generation capacity (United Nations Economic Commission for Europe [UNECE], 2021). Similarly, wind energy has experienced substantial growth in Canada over the past decade, and it is the cheapest source of power over its lifecycle (Canadian Renewable Energy Association, 2024). Wind energy accounts for 6% of electricity generation in Canada (Natural Resources Canada, 2020), and According to the Canadian Renewable Energy Association (CREA) "there has been more wind-energy capacity installed in Canada over the last decade than any other form" (CREA, 2024). Wind power also has among the lowest carbon emissions per kWh of any electricity source, with the UNECE finding that on average, across its lifecycle, only nuclear power had lower emissions per kWh, and solar power had comparable carbon emission. Compared to nuclear, wind energy does not have the challenges of disposing of radioactive materials and potential human toxicity associated with these sources of ionizing radiation (UNECE, 2021). Compared to solar power, wind energy had lower extractive impact and lower land occupation (UNECE, 2021). Further, with increasing efficiencies in wind turbine energy generation, fewer turbines are needed to produce the same amount of electricity, thus reducing their environmental impact per kWh of generation by 14% for every doubling in installed generation capacity (UNECE, 2021). Taken together, throughout its lifecycle, wind power is a cheap, safe, low-impact source of low-carbon energy and is an important part of a multi-source low-carbon energy portfolio.

However, development of wind energy resources in Canada lags significantly behind its European and OECD counterparts (Andersen, 2014). Major international initiatives on sustainable development and climate mitigation, including the United Nations Sustainable Development Goals (SDGs) (UN, 2015), the Fifth Intergovernmental Panel on Climate Change (IPCC, 2014), and the Deep Decarbonization Pathways Project (DDPP, 2015), all highlight the need for significantly increased deployment of renewable energy in order to reduce carbon emissions and meet the Paris Agreement goal of limiting global temperature increases to below 2℃ (Paris Agreement, 2015).

#### 1.0.1 The Canadian Electrical Grid

The Canadian electrical grid is interconnected with the United States and consists of four separate interconnections (Ela et al., 2011). The Eastern Interconnection and the Western Interconnection are the largest and serve both the United States and Canada. The Texas Interconnection serves the state of Texas, and the Quebec Interconnection serves the provinces of Quebec and Newfoundland and Labrador (Figure 1). The interconnections operate independently, and while electricity flows freely within each interconnection, transfer between each interconnection is limited to a few high-voltage direct current (HVDC) transmission lines (Ela, 2011). Within the Western and Eastern interconnections there are more North-South international connections between Canada and the United States than East-West intranational connections. The international nature of the Canadian electric grid means that increasing—or failing to increase—transmission capacity for wind energy in one country directly affects the other.

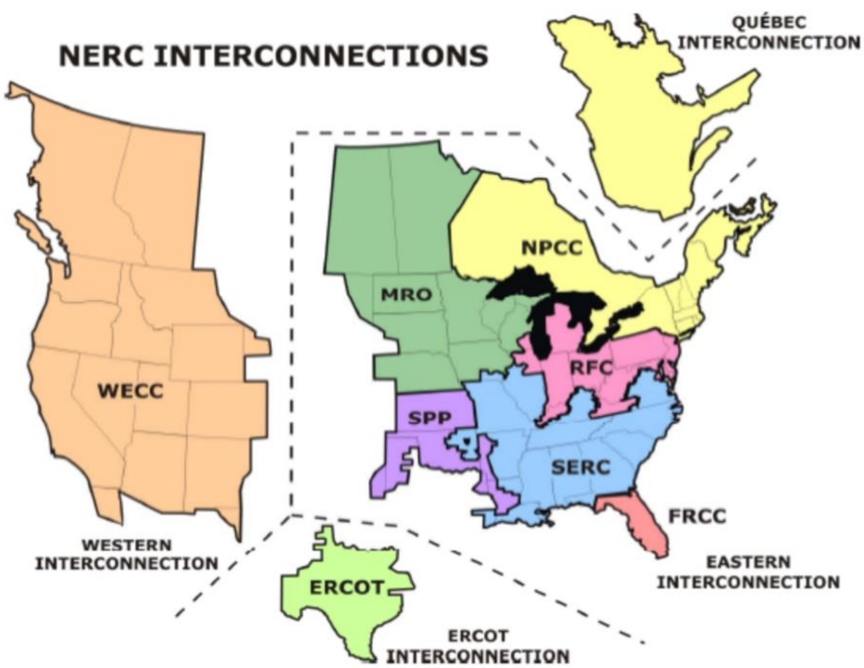


*Figure 1. Map of North American Electricity Grid Interconnections (Ela et al., 2010).*

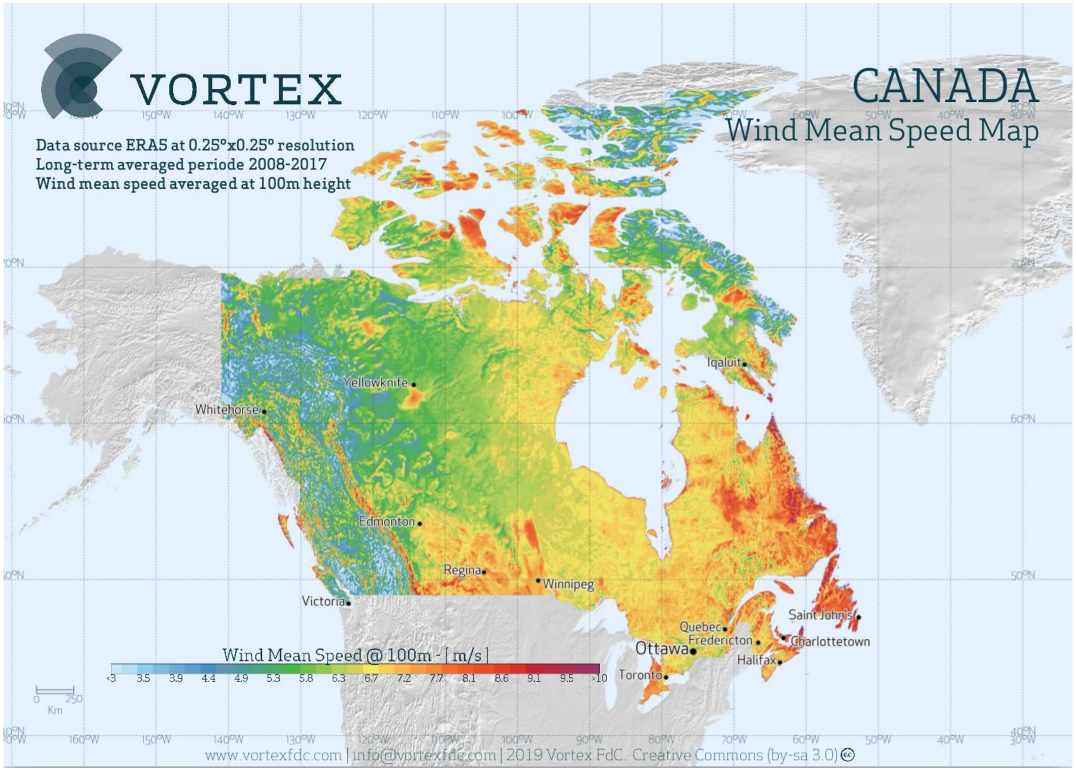


*Figure 2. Map of Canadian Onshore Wind Resources Potential (Vortex, 2019).*

### 1.0.2 Canadian Transmission Line Permitting Process

Permitting processes for interprovincial and international transmission lines in Canada are centralized and a single regulator, the Canada Energy Regulator (CER) has jurisdiction over interprovincial and international transmission lines, and provinces do not have veto power over CER decisions (Christian & Shipley, 2020). Individual provinces and territories have permitting authority over intraprovincial transmission lines, and the methods and structure of these regulatory bodies and their regulatory mandate vary by location.

Many provinces have a vertically integrated electricity system with close ties to the regulatory agency in charge of permitting transmission lines, including British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Quebec, and Saskatchewan (Christian & Shipley, 2016). These provinces own the dominant electricity company within their borders. By contrast, Alberta and Ontario have market-oriented electricity systems, with multiple service providers (Christian & Shipley, 2016). Alberta in particular has a competitive electricity market (Christian & Shipley, 2016). In market-oriented provinces electricity generation and transmission systems tend to be unbundled, that is, owned and operated by separate entities (Christian & Shipley, 2016). By contrast, in vertically integrated provinces the crown corporations that dominate the electricity market also tend to own and operate the transmission system (Christian & Shipley, 2016). As such, there are differences in the permitting processes in vertically integrated and market-oriented provinces, and there tend to be fewer barriers to new transmission infrastructure in vertically integrated provinces (Christian & Shipley, 2016).

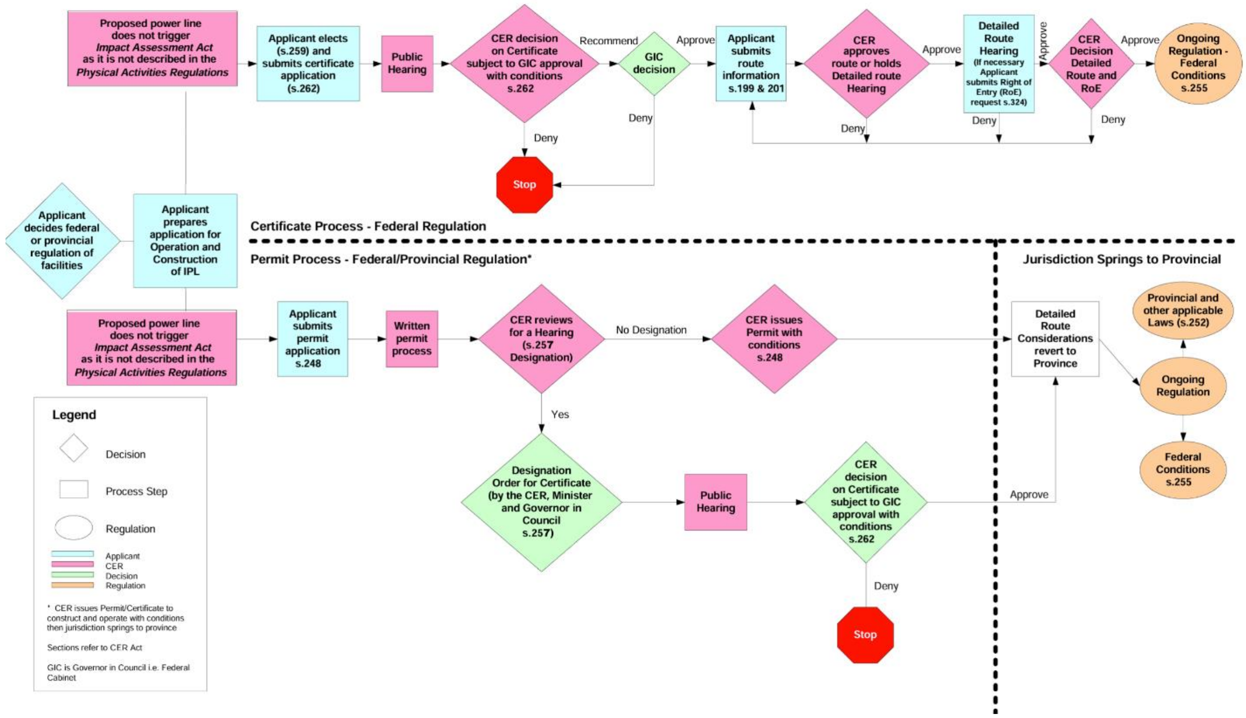


*Figure 3. CER Transmission Line Permitting Process Flowchart (CER,2020).*

Despite these differences in market dynamics, permitting processes across all provinces and territories and the federal government share a number of common elements. First, an applicant submits an application for a permit or a license to construct a transmission line to the applicable regulator (CER, 2023). This application typically includes technical specifications, siting, demonstration of need, demonstration that the project is for the public good or creates public values, evidence of minimal or mitigatable environmental impacts, and adequate Indigenous consultation and accommodation (CER, 2023; Appendix F). After the application is received, the regulatory agency will typically review the application and begin a public notice and comment process, soliciting feedback from the impacted community (CER, 2023). Depending on the scope of the project and the details submitted with the application, the regulator may also require an environmental assessment or further Indigenous consultation and accommodation (CER, 2023). The environmental assessment is typically overseen by a separate agency, such as Natural Resources Canada (NRC), or the provincial equivalent. At the conclusion of the notice and comment process, the regulator may ask the applicant for further information and engage in correspondence (CER, 2023). If there are objections from landowners or other stakeholders, the applicant must address them to the satisfaction of the regulator (CER, 2023). This correspondence and amendment process can take a substantial amount of time, especially if the scope of the project is large or there are particularly serious concerns about the impact of the project. Finally, the regulator will issue a final decision on the permit (CER, 2023).

## *1.1 Problem Statement*

The best wind resources in Canada are often located in rural and remote areas that are far from high-population demand centers, and new power lines often must cut across long distances to reach consumers (Coleman, 2019; Klass, 2015). In Canada, excellent onshore wind resources are found in the Great Plains in Alberta and Manitoba, along the Great Lakes and in the Bruce Peninsula in Ontario, and on the Atlantic Coast in Quebec, Newfoundland and Labrador, Nova Scotia, New Brunswick, and Prince Edward Island (Figure 2).

When wind energy generation projects are installed in areas that are unserved by the existing grid, new transmission lines are required to connect wind farms to the existing grid. When wind energy generation projects are installed in areas that are underserved by the existing grid, transmission lines must be expanded, upgraded, or replaced to prevent excessive curtailment. New and upgraded transmission lines are thus necessary to reduce system congestion, and efficiently and reliably deliver wind energy to electricity consumers. However, a tangled web of interconnected and overlapping barriers hinder the smooth development of the transmission infrastructure needed to support increased wind energy generation.

Barriers to constructing new wind energy transmission lines include permitting processes that are designed to accommodate fossil-fuel based energy sources (Coleman, 2019; Kassakian, 2011; Klass, 2015; Stafford & Wilson, 2016), transmission line siting and eminent domain challenges from landowners (Coleman & Klass, 2019), public opposition to transmission projects (Bohn & Lant, 2009; Coleman, 2019; Ferguson-Marin & Hill, 2011), a patchwork of inconsistent federal and provincial renewable energy policies (Menz & Vachon, 2006; Schumacher & Yang, 2018), and a lack of political certainty regarding renewable energy policies (Bird et al., 2005; Ferguson-Martin & Hill, 2011; Hitaj, 2013; Laird & Stefes, 2009; Schumacher & Yang, 2018).

Bohn & Lant (2009) found that the primary predictors of wind energy development are not physical wind energy potential or technological factors, but a combination of socio-economic factors, including population distribution, access to existing transmission infrastructure, the regulatory landscape, and public opinion on wind energy development. Similarly, Menz & Vachon (2006) found that the competitiveness of wind energy in a given region was determined by a combination of the physical wind energy potential and the availability of grid access and transmission infrastructure. Diogenes et al. (2020) and Fischlein et al. (2010) conducted studies on the barriers to renewable energy, and both found that lack of transmission infrastructure were the second-most experienced barriers to wind energy deployment. A comprehensive Massachusetts Institute of Technology (MIT) study on the future of the electrical grid in the

United States (Kassakian et al., 2011) also identified transmission capacity as a major variable in the ability to increase renewable energy penetration and devoted an entire chapter to the challenges of building new transmission infrastructure.

Indeed, the lack of transmission capacity for wind energy is commonly discussed in the literature, and numerous studies have found that the lack of grid access and transmission capacity are among the greatest barriers to increased deployment of wind energy (Andersen, 2014; Baringo & Conejo, 2012; Coleman & Klass, 2019; Ferguson-Martin & Hill, 2011; Hitaj, 2013; Hoppock & Patiño-Echeverri, 2010; Jorgensen et al., 2018; Klass, 2015; Schumacher & Yang, 2018; Stafford & Wilson, 2016). In addition to hindering the construction of new wind farms, insufficient transmission access is a primary cause of curtailment for existing wind energy facilities (Jorgensen, 2018).

While other forms of low-carbon and renewable energy—such as hydropower, nuclear, or solar—are point sources that require a single transmission line to connect to the grid, wind is highly distributed and requires substantially more transmission infrastructure than other sources of low-carbon and renewable energy. Thus, while the permitting process for transmission lines to connect wind energy to the grid is the same as the permitting process for any transmission line, regardless of energy source, the highly distributed nature of wind energy, combined with its aesthetic impact, means that wind energy is particularly susceptible to inefficiencies in the permitting process and to more frequent public opposition and landowner challenges. As such, studying the transmission line permitting process is particularly valuable in the context of wind energy generation and its importance to the energy transition.

## *1.2 Significance of the Problem and Contribution of the Study*

The current electricity transmission system is unequipped to handle significant changes in the composition of the electricity system, and it will be unable to adapt to further expansion of intermittent renewable energy penetration without deployment of additional transmission infrastructure (Andersen, 2014). The resultant slowed expansion of transmission infrastructure creates a significant bottleneck that hinders the ability of Canada to achieve the high penetration of renewable energy necessary to reduce greenhouse gas emissions and limit global temperature increase to below 2℃. There are significant environmental and climate costs for failing to expand transmission capacity: if electricity producers are unable to access cheaper and cleaner sources like wind power, they will be forced to rely on fossil fuel sources of energy, which generate substantial greenhouse gas emissions, degrade the environment, and accelerate climate change (Coleman, 2019), or alternative low-carbon sources of energy generation that have higher environmental and social impacts.

The purpose of this study is to facilitate elimination of this transmission bottleneck and increase wind energy penetration by identifying and examining the social, legal, and political factors that influence the permitting process of wind energy transmission line projects. The findings of this study will provide practical information to practitioners, project leaders, government actors, and relevant stakeholders as they seek to complete future wind energy transmission projects; provide information on the relative influence of social, legal, and political factors on wind energy transmission projects for researchers and academics in the field; and contribute to the study of the transformation of the global energy economy.

## *1.3 Research Questions and Objectives*

The objective of this study is to create a deeper understanding of how legal, social, and political factors impact the permitting process of wind energy transmission projects to facilitate increased wind energy generation capacity in Canada. To achieve this research objective, this study will address the following two research questions:

**RQ1:** What are the social, legal, and political factors that impact the permitting process for wind energy transmission line projects?

**RQ2:** How do the identified social, legal, and political factors influence the regulatory success (i.e., permit approval) or failure (i.e., permit denial or withdrawal) of wind energy transmission line projects?

Based on the literature surveyed, it is hypothesized that institutional theory will guide the effect of the identified legal factors, social license theory will guide the effect of the identified social factors, and public values theory will guide the effect of the identified political factors.

## *1.4 Study Limitations*

This study is focused on the legal, social, and political factors that impact wind energy transmission line projects and will not consider other factors that influence these projects, including technical and financial considerations. The factors in this study were chosen because research into wind energy generation has found that the legal, social, and political factors tend to have a greater influence on projects than technical or financial factors, and it is expected that wind energy transmission projects will also be strongly influenced by similar legal, social, and political factors (Bohn & Lant, 2009; Diogenes, 2020; Fischlein, 2010; Menz & Vachon, 2006). While this study is sought to engage in a broad look at the legal, social, and political factors, time and resource constraints meant that it was not be able to delve deeply into any one factor, and instead, the study examined at the relative weight of broad categories of legal, social, and political factors. Investigating each factor in depth may be an avenue for further research into wind energy transmission line projects.

This study is focused on the permitting process from a regulatory perspective, rather than a social or justice perspective. This study will focus on how social factors influence the transmission line permitting process but will not focus on how to increase community participation and engagement in this process. Public participation and community engagement in transmission line planning is a critical issue and is a potential avenue for further research on wind energy transmission projects but is beyond the scope of this proposed study.

One possible alternative solution is to increase storage for wind energy, thus alleviating congestion on the electrical grid and necessitating fewer new power lines. However, while the International Energy Association (IEA) has noted that improvements are rapidly being made in the area of energy storage—including pumped hydropower and grid-scale batteries—energy storage capacity is still far from sufficient to support increased renewable penetration and is not yet capable of reaching the necessary commercial scale (International Energy Association, 2023). Jorgensen (2018) compared increasing transmission to increasing energy storage and found that increasing transmission was a more cost-effective and reliable method for reducing wind energy curtailment given the current state of energy storage technology. Although energy storage solutions will likely play a significant role in the decarbonization of the electricity sector

(IEA, 2023), increasing transmission infrastructure is a more pressing problem, and one able to be solved with current technology. Further, energy storage solutions that require substantial infrastructure are likely to face similar issues during the permitting process.

# Chapter 2. Literature Review

## *2.1 Theoretical Considerations*

### 2.1.1 Institutional Theory

Institutional theory is concerned with the processes of creating and implementing governmental regulations and policies and focuses on the interplay between regulators and political processes (Carrigan & Coglianese, 2011). Institutional theory emphasizes the interaction between social and cultural pressures imposed on organizations and how these pressures affect organizational structures and processes (Delmas & Toffel, 2004). While institutional theory was developed as a management theory of firms, it has been adapted to the specific issues surrounding governmental institutions (Carrigan & Coglianese, 2011). Because understanding the legal factors that influence transmission projects requires an understanding of the processes that underlie the creation and implementation, institutional theory is a useful framework for evaluating the legal factors that influence transmission projects and for understanding the regulatory transitions occurring during the renewable energy transition (Lockwood, 2016). (Jehling et al., 2019; Lockwood et al., 2016).

In the private sector, governmental regulation is one of the pressures that impact organizational structures and processes, while governmental institutions are affected by pressures from both the organizations that it is seeking to regulate and from the public (Delmas & Toffel, 2004). Additionally, individual regulatory agencies face pressures from other parts of the government, such as legislative or executive branch agendas, policies, and goals, which can lead to regulatory capture, inefficiency, and governmental actions that do not appear to serve the public interest (Carrigan & Coglianese, 2011). Institutional theory holds that regulatory inertia, such as the inability of current regulatory processes to keep pace with increased transmission capacity requirements to support wind energy, arises from deregulation, a high number of entities with veto power, and regulatory policies that are not consistent with the renewable energy transition (Lockwood, 2016). Indeed, comparatively longer permit decision times in decentralized American transmission line permitting regime support these conclusions (Klass, 2015).

In the context of the transmission line permitting process for wind energy, institutional theory informs the ways in which permitting processes are structured, whether these processes are achieving the objectives of the regulators, and whether there is regulatory inertia or regulatory capture that results in processes that do not serve the public good or do so inefficiently. Ferguson-Martin & Hill (2011) applied an institutional theory approach to investigating the variation in wind energy deployment across Canadian provinces, finding a complex array of factors that directly and indirectly influence wind energy deployment. Specifically, they found that "wind energy deployment depends upon a combination of indirect causal factors—landscape values, political and social movements, government electricity policy, provincial electricity market structure and incumbent generation technologies and direct causal factors—grid architecture, ownership patterns, renewable incentive programs, planning and approvals processes and stakeholder support and opposition." Jehling et al. (2019) emphasized that institutional theory and frameworks are "valuable in further informing and enhancing comparative research on energy transitions."

### 2.1.2 Social License to Operate

Social license to operate theory began as a metaphor in the mining sector in the 1990s and entered the academic lexicon in 2000 in a paper by Joyce and Thomson (2000, as cited in Boutilier, 2017). A social license to operate is defined as a “community’s perceptions of the acceptability of a company and its local operations” (Boutilier & Thomson, 2011, as cited in Wood & Thistlethwaite, 2018). Social license to operate theory developed within the context of mining and extractive industries, but in the past decade, it has been expanded to a number of other sectors (Boutilier, 2017; Wood & Thistlethwaite, 2018), including infrastructure and wind energy (Colton, et al, 2016; Langbroek & Vanclay, 2012; Stephens & Robinson, 2021).

A social license to operate is analogous to a regulatory permit and is intimately connected to stakeholder management theory. Indeed, Colton et al. (2016) argue that a social license is a level of regulation, albeit a social, not legal, one. Social license to operate is a dynamic concept, and it can vary across different stakeholder groups and across regions, such as in the case of transmission line projects that may cross through multiple communities or jurisdictional boundaries. It also has a temporal component and can change over the life of a project as public trust and acceptance changes in response to the behavior of the firm in managing the project and potentially due to broader societal, social, and political factors (Dare et al., 2014; Wood & Thistlethwaite, 2018). Dare et al. (2014) identified three primary components to securing a social license to operate: (1) trust in the organization, (2) the organization’s capacity to engage stakeholders, and (3) the ability of the organization to respond to changing expectations. Moffat and Zhang (2014) developed a quantitative method for measuring social license to operate across four predictor variables (impacts on social infrastructure, contact quality, contact quality, and procedural fairness) and one mediator variable (trust). They found that contact quantity, contact quality, procedural fairness, and trust had a positive correlation with granting of a social license to operate, while impacts on social infrastructure had a negative correlation (Moffat & Zhang, 2014), findings which align with Dare's et al. (2014) qualitative list of factors.

In a review of social license to operate in the Canadian energy regulation context, Colton et al. (2016) recommended increased governmental coordination and stakeholder engagement—with a focus on Indigenous participation and consultation—in energy infrastructure projects. While Colton et al. (2016) focused on pipeline infrastructure permitting and planning, transmission projects face similar challenges, and require similar levels of government coordination and stakeholder engagement. At a fundamental level, social license to operate is an expression of community acceptance and trust (Dare et al., 2014; Moffat & Zhang, 2014).

### 2.1.3 Public Values Theory

Public values theory is primarily concerned with public management and is particularly appropriate for analyzing the convergence of regulatory, political, and public forces in the infrastructure sector (Bozeman, 2009). Public values theory was popularized by Moore (1995), who posited that "the aim of managerial work in the public sector is to create public value." Public values theory incorporates both elements of institutional theory and social license to operate theory in its analysis of both regulatory and structural forces and social and political forces (Williams & Shearer, 2011), and the nexus between public and private values (Bozeman, 2009). The theory is further connected to social license to operate theory through its focus on the need for government actors to ensure public trust and legitimacy (Faulkner & Kaufman, 2017).

To the extent that there can be a tension between regulatory institutions that are charged with ensuring the public good in a broad sense—such as for an entire province or nation—and a social license to operate—which has a nexus with the community immediately surrounding and directly affected by a given infrastructure project—public values theory provides a theoretical framework for evaluating the degree to which the regulator has achieved the goal of balancing these two competing and not always complementary objectives. Williams and Shearer (2011) have identified three points of a "strategic triangle" that underlies public values theory: (1) the normative importance of pursuing goals that bring measurable benefit to the public, (2) the recognition that pursuing public goals requires both government authorization and public support, and (3) that public goals must be practically achievable.

Researchers have found that public values theory is exceptionally relevant to regulation in the public interest (Fukumoto & Bozeman, 2018), such as infrastructure projects (Bozeman, 2009). Foley et al. (2021) examined the application of public values theory in the energy transportation sector and found that "public values theory can serve to assess the non-economic impacts and implications of proposed energy transportation infrastructure beyond an assessment of market value." Mirroring the findings of prior research on social license to operate theory (Moffat & Zhang, 2014), Foley et al. (2018) concluded that public values theory emphasizes the need for community engagement and partnership in infrastructure projects.

## *2.2 Legal, Social, and Political Considerations*

### 2.2.1 Permitting Processes

Permitting processes for interprovincial and international transmission lines in Canada are centralized and a single regulator, CER has jurisdiction over interprovincial and international transmission lines, and provinces do not have veto power over CER decisions (Christian & Shipley, 2020). While the CER has sole permitting authority of interprovincial and international transmission lines, provinces may view interprovincial or international power lines that cross through their land with skepticism, believing that no economic or financial benefits will accrue within their borders, and attempt to stymie the line, despite the regional benefits from improvements to electricity generation and reliability, and carbon emissions reductions from increased renewable penetration (Christian & Shipley, 2020; Coleman, 2019; Kassakian, 2011).

Klass (2015) advocates for a more centralized, regional permitting process for transmission line projects. However, attempts to adapt planning and permitting processes to the unique attributes of wind and other renewable energy sources have not yet made significant headway. Stafford and Wilson (2016) found that permitting processes for wind energy transmission lines are still disproportionately designed to accommodate fossil-fuel based energy sources, resulting in significant delays to the construction of new wind energy generation facilities that depend upon construction of new transmission lines. As highlighted by Lockwood et al. (2016), this regulatory inertia results in delaying the energy transition and prolonging an over-reliance on carbon-based and more expensive energy sources.

### 2.2.2 Siting and Land Acquisition

New transmission lines must be sited across potentially hundreds of miles of public and private land. In Canada the government has the power of expropriation, which they can exercise for land acquisition purposes when siting and constructing transmission lines. This doctrine permits the government to purchase, at fair market value, easements from landowners for public use (Coleman & Klass, 2019). Without the power of expropriation, a single landholder along the proposed route of the transmission line could refuse to grant an easement, and derail the entire project (Coleman & Klass, 2019).

Expropriation is increasingly controversial among landowners—and among environmental advocates concerned about disruption to wilderness areas—who argue that power lines are not a public use because they benefit electricity generation and distribution companies (Coleman & Klass, 2019). Resistance to land acquisition in the cases of oil and gas pipelines also threaten to constrain the development of power lines for wind energy, despite the greater environmental and climate benefits of wind energy when compared to fossil fuel sources of energy (Coleman & Klass, 2019). Klass (2015) argues that policymakers must make fundamental reforms to planning, permitting, and siting regulations for transmission projects, otherwise wind energy resources "will remain trapped where they are least needed."

### 2.2.3 Public Opposition

Wind energy transmission projects have seen increased public opposition to wind energy deployment and new transmission projects on aesthetic and environmental grounds (Ferguson-Martin & Hill, 2011). While it is true that power lines do cause environmental impacts due to their permanent, above-ground nature, they cause fewer impacts than oil and gas pipelines because there is no danger of environmental or groundwater contamination due to a spill. Further, power lines for wind energy projects also have additional climate benefits by enabling the transition away from high-carbon sources of electricity. Unfortunately, their above-ground nature also gives rise to public opposition on aesthetic grounds, with individuals and communities objecting to what they consider permanent eyesores (Coleman, 2019; Kassakian, 2011).

Ferguson-Martin and Hill (2011) found that there is growing anti-wind opposition in a number of Canadian provinces on “noise, health impacts, landscape and esthetic impacts, wildlife concerns, property value, and procedural fairness” grounds, and that while the anti-wind movement has not yet significantly slowed wind energy transmission projects, the trend is moving in that direction. Koecklin, et al. (2021) found that in Ireland public opposition to wind energy generation and transmission projects resulted in a 33% greater system cost, compared to scenarios without opposition. The authors found that most of the increased cost was due to a combination of a decrease in wind generation capacity and the increased cost of using alternative means of energy generation (Koecklin, 2021).

Bohn and Lant (2009) found that, consistent with the social license to operate theory, where there is significant opposition to wind energy, it is incumbent upon developers to ensure procedural legitimacy and fairness while engaging in meaningful stakeholder consultation. As the pace of wind energy development continues to increase, it will become ever more important for project leaders to secure a social license to operate by ensuring that they are giving appropriate weight and consideration to local and Indigenous communities during the consultation process, and ensuring full participation and ownership of transmission line projects (Bohn & Lant, 2009; Foley et al., 2021).

### 2.2.4 Lack of Political Certainty for Renewable Energy Policies

Partisan political forces can function as a barrier to wind energy transmission projects, as policies and platforms change in accordance with changes in governmental power. The example of the Renewable Energy Production Tax Credit in the United States illustrates the unpredictable and volatile effect partisan politics can play on wind energy generation and transmission. Introduced in 1992, the federal Renewable Energy Production Tax Credit (PTC) (Electricity produced from certain renewable resources, etc. [PTC], 2018) has functioned as a major catalyst of wind energy generation (Schumacher & Yang, 2018). However, the PTC requires regular renewal by Congress, and wind production has plummeted when it has lapsed, effectively destabilizing the wind energy industry (Laird & Stefes, 2009; Schumacher & Yang, 2018). As institutional theory predicts, this political unpredictability and inconsistency affects wind energy deployment by increasing risks for developers, creating boom-and-bust cycles, and ultimately leads to substantially lower levels of wind energy generation during bust cycles (Bird et al., 2005; Ferguson-Martin & Hill, 2011). Similar effects occur in Canada as the priorities of the federal and provincial governments change depending on which party holds power.

## *2.3 Identification of Gaps in the Literature*

While some researchers have investigated the structural and institutional determinants of success for wind energy generation projects, limited attention has been paid to the factors influencing transmission capacity. Anderson (2014) noted that while there is a wealth of research on the development of renewable energy, there is a significant lack of focus on the transmission infrastructure needed to support expanded renewable energy generation capacity. While Fischlein (2010), Diogenes (2020), and Hitaj (2013) investigated the barriers to wind energy deployment, they considered transmission capacity as a barrier, and did not focus on the factors that hinder increases to transmission capacity. Similarly, while Bohn & Lant (2009) investigated the factors and policies that predict the deployment of wind energy, they did not study the factors that predict the success of constructing transmission lines to support wind generation.

Stafford and Wilson (2016) and Fischlein (2010) have noted that there is little focus in the academic literature on regulators and regulated entities in complex regulatory environments and have emphasized the need for further study of practitioners and regulators in order to gain a deeper understanding of the determinants of success for wind energy generation projects.

Thus, although scholars have consistently identified a lack of sufficient transmission capacity as a one of the most significant barriers to expanding wind energy generation capacity, and have identified social, legal, and political factors as the most important predictors for wind energy generation capacity, there has not yet been an analysis of how these factors influence the permitting process for wind energy transmission line projects. This proposed study seeks to address this gap in the literature.

*Table 1. Predictor and Outcome Variables*

| | Legal Factors | Social Factors | Political Factors | Other Factors |
|---|---|---|---|---|
| Guiding Theory | Institutional theory | Social license to operate theory | Public values theory | |
| Predictor Variables | • Ease of siting process<br>• Government use of expropriation to obtain land<br>• Ease of permitting process<br>• Centralized vs. decentralized permitting process | • Community engagement in consultation process<br>• Community support for wind energy<br>• Lobbying/special interest opposition<br>• | • Provincial and/or federal support for project<br>• Provincial and/or federal policies supporting renewable energy projects<br>• Majority party in control of provincial and/or federal government | • Wind energy generation potential<br>• Financial viability of the project |
| Outcome Variable | • Permit approval, denial, or withdrawal | • Permit approval, denial, or withdrawal | • Permit approval, denial, or withdrawal | • Permit approval, denial, or withdrawal |

# Chapter 3. Methods

## *3.1 Methodological Approach*

Qualitative research is appropriate when a problem or area has not yet been studied thoroughly and needs to be explored (Creswell & Creswell, 2018). As the predictors and factors that influence wind energy transmission line projects have not been thoroughly identified, a qualitative exploration of this topic was appropriate. However, qualitative studies are not well-equipped for drawing causal inferences or making generalizable conclusions; instead, quantitative methods excel at providing these insights (Creswell & Creswell, 2018). As this study sought to draw causal inferences about significance and relative size of the impact of each identified legal, social, and political factor and generate generalizable conclusions, a quantitative phase was also appropriate. In order to harmonize these twin exploratory and explanatory aims, a mixed methods design provided the best approach for answering this study's two research questions (Creswell & Creswell, 2018; Srnka & Koeszegi, 2007).

## *3.2 Research Paradigm and Ontological and Epistemological Considerations*

Given the context of the proposed study, this mixed-methods research design incorporates a combination of qualitative and quantitative approaches. However, the study is fundamentally rooted in a quantitative approach because the proposed study will be drawing its conclusions from a quantitative analysis of the survey data. The proposed study is ontologically consistent with realism and incorporates both post-positivist and pragmatic epistemologies. This proposed study is consistent with the deterministic philosophy that underpins post-positivism (Creswell & Creswell, 2018) because legal, social, and political factors can be quantitatively measured and analyzed to conclusively determine their causal impact on wind energy transmission projects. Aligned with the pragmatist's goal of attempting to construct a practical, solutions-oriented understanding of a problem (Creswell & Creswell, 2018), this proposed study is also seeking to generate conclusions that can be utilized by practitioners in the renewable energy and electrical infrastructure industries. While the renewable energy transition is arguably transformative, this study is not closely aligned with the transformative epistemology because it is not exploring the transformative impact of the renewable energy transition (Creswell & Creswell, 2018).

## *3.3 Document Analysis*

The first phase of this study consisted of a content review of permitting documents for wind energy transmission lines issued by federal and provincial authorities. The goal of this document analysis was to identify the social, legal, and political factors that regulatory bodies were using in their findings when making final permitting decisions. As this document analysis of permitting documents was part of an exploratory and qualitative phase of the research project, cases were selected to be generalizable but not necessarily representative at a statistical sampling level.

Three Canadian provinces (Alberta, Ontario, and Nova Scotia) and the federal government were selected for review. The provinces were chosen because they have the highest wind energy generation capacity in their region of Canada: Alberta leads Western Canada, Ontario leads Central Canada (which includes Quebec), and Nova Scotia leads Atlantic Canada

(Noel, et al., 2022; Statistics Canada, 2023). Figure 3 shows the installed capacity in each province and territory.

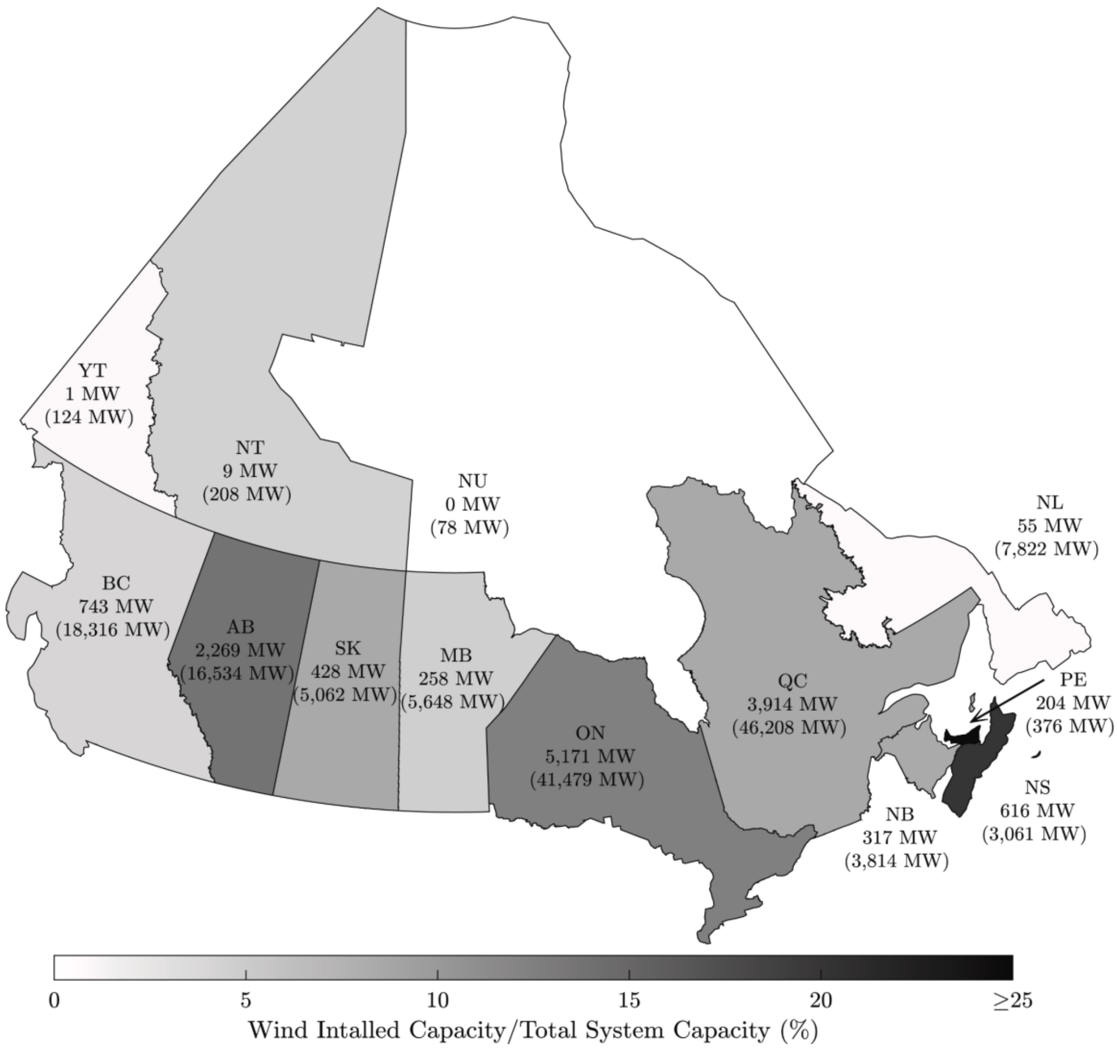


*Figure 4. Installed Wind Energy Capacity by Province and Territory (Noel et al., 2022).*

### 3.3.1 Inclusion and Exclusion Criteria

Projects were eligible to be included if they fulfilled all of the following criteria: (1) the project was located within one of the four selected jurisdictions, (2) the project had a nexus with wind energy generation, and (3) the project was issued a final decision or the permit was withdrawn between January 1, 2018 and December 31, 2022.

Projects were identified by searching the regulatory database or archive for each of the four selected jurisdictions. Interprovincial and international transmission line projects were selected by searching the CER filing database REGDOCS and using advanced search terms including “wind energy” and “transmission line” and date ranges to select projects that met all three inclusion criteria. Transmission line projects in Ontario were selected by searching the Ontario Energy Board database for “transmission line” and manually selecting projects that had a nexus with wind energy after reviewing the description of the project. Transmission line projects in Nova Scotia were not publicly available and were unable to be reviewed. Transmission line projects in Alberta were selected by searching the Alberta Electric System Operator database and selecting projects that had the term “wind” in the title and met all three inclusion criteria. Although the Alberta Utilities Commission is charged with regulating and approving transmission line projects in Alberta, their database does not include a publicly available archive of completed projects with final decisions. Instead, the Commission makes publicly available only documents related to ongoing projects that have not received a final decision.

A “nexus with wind energy” was defined as a transmission project that was explicitly being undertaken in order to (1) connect an unserved wind energy project to the existing grid, (2) improve or update an existing transmission line in order to support local or regional wind energy projects, or (3) construct new transmission lines to increase capacity of the grid in order to support increased wind energy capacity and penetration throughout the region or interconnection. Type 1 projects were generally intraprovincial and of low to medium distance (0-50km), type 2 projects were typically intraprovincial and of medium to long distance (50-200km), and type 3 projects were generally interprovincial or international and of long distance (>200 km).

Conclusion of the permit process was defined as a final outcome on the status of the permit: permit approval, permit denial, or withdrawal of the application.

### 3.3.2 Content Analysis and Coding

Content analysis is the systematic process of analyzing text through consistent categories based on an explicit coding protocol (Stemler, 2001). Content analysis is useful for examining trends, and generating data that can be analyzed using quantitative methods (Stemler, 2001). This research project utilized *a priori* coding, where the coding categories are determined based on prior research and theoretical frameworks and were then refined during the data analysis phase to account for newly identified or emergent patterns and factors (Stemler, 2001). *A priori* coding is appropriate when engaging in theory testing, and when engaging in quantitative content analysis (Stemler, 2001).

For each selected project, the document stating the final outcome of the project ("final decision document") was analyzed and coded. The initial application document and other supporting documents present in the project record were also examined in order to provide context when needed to clarify the final decision document. Selected projects were coded for the legal, social, and political variables listed in Table 1. The categories were selected based on prior research into the predictors of wind energy generation capacity (Bohn & Lant, 2009; Diogenes, 2020; Fischlein, 2010; Menz & Vachon, 2006; Schumacher & Yang, 2018), social license to operate theory (Colton et al., 2016; Moffat & Zhang, 2014; Langbroek & Vanclay, 2012; Stephens & Robinson, 2021), public values theory (Foley et al., 2021) institutional theory (Ferguson-Martin & Hill, 2011), and the emergent factors identified in the documents themselves.

In order to ensure accurate and valid coding for the permit documents, a pilot study was completed. A small sample of 2-4 projects was selected from each of the four jurisdictions. The final decision document was coded for the factors listed in Table 1 and any emergent social, legal, or political factors that the regulator identified in their findings of fact or rationale for their decision. The results of this pilot study resulted in the suspension of the content analysis, which will be discussed in detail in section 5.1.

### 3.3.3 Methodological Boundaries

Consideration was given to formally analyzing and coding the environmental assessment and consultation documents for the project; however, this approach was rejected because environmental assessments and consultations are conducted and reviewed by governmental agencies other than the permitting authority. As this study is interested in the activity of permitting authorities and energy regulators, environmental assessment and consultation documents were excluded from the analysis. However, these documents were consulted when necessary to provide context to the final decision document.

Public documents submitted to regulatory agencies are largely credible and widely used for similar analysis but are not devoid of information gaps and subjective assessments of the projects being proposed. However, these limitations are unlikely to have negatively impacted the document analysis because the goal of the exploratory content analysis was to identify the factors that permitting authorities were citing in their final decision documents in order to tailor further quantitative analysis. Consideration was also given to conducting a computer-assisted content analysis; however, this was not feasible for reasons that will be discussed in sections 4.1 and 5.1.

## *3.4 Survey*

The second phase of this study consisted of a survey sent out to practitioners with experience in wind energy and the transmission line permitting process. The goal of this survey was to gain insight from a sample of practitioners who are engaged in all stages of the permitting process, including those employed by permitting authorities, energy regulators, energy producers, private firms, consultants, industry associations, and non-governmental associations.

There is little focus in the academic literature on regulators and regulated entities in complex regulatory environments, and investigation of practitioners and regulators is necessary in order to gain a deeper understanding of the factors that influence the permitting process (Fischlein, 2010; Stafford and Wilson,2016). Further, a survey targeting practitioners and industry experts is especially appropriate when assessing institutional factors (Fischlein, 2010), in this case, the legal, social, and political factors that impact wind energy transmission projects.

#### 3.4.1 Survey Design

The survey was developed by utilizing findings from prior research into the determinants of success for wind energy projects, and applying them to the permitting process paradigm, including the set of predictor and outcome variables listed in Table 1. This survey was designed to answer three questions in order to address RQ2: (1) Which factors impacted permit approval, denial, and withdrawal? (2) What was the relative impact of each factor? (3) If public opposition, lobbying, or special interests contributed to permit denial or withdrawal, what were the reasons for opposition to the project?

Questions were designed in accordance with best practices in survey design, while also acknowledging the high sophistication and expertise of the population being surveyed. Questions were designed to be as clear and concise as possible, and related groups of questions were preceded by a brief introduction in order to help participants frame their answers (Lietz, 2010). Questions were written in the active voice and avoided negative language and double-barreled questions (Lietz, 2010). An 11-point Likert scale was used in order to measure the impact of the social, legal, and political factors. An 11-point Likert scale was chosen for two reasons (1) because research has found that avoiding a “middle” option tends to require participants to make a judgment call and reduces apathetic responses, and (2) because an 11-point Likert scale that ranges from 0-10 can be treated as a continuous variable (Harpe, 2015).

As this survey was designed to be completed online, including on mobile devices, it was optimized for visibility on either a computer, tablet, or cell phone. Research into web and mobile survey response rates has found that open-ended questions tend to elicit fewer responses (De

Bruijne & Wijnant, 2014), as such, most questions were close-ended with either radio buttons for single responses or checkboxes for multiple responses. Although research has found that 11-point Likert scales increase survey completion time and burden on survey takers (De Bruijne & Wijnant, 2014), the benefit of being able to analyze the longer scale as a continuous variable was determined to outweigh these considerations.

### 3.4.2 Survey Content

The survey was an online questionnaire hosted by Qualtrics. It was comprised of 7 primary sections: (1) information and consent, (2) introductory and demographic questions, (3) questions about “combined projects,” (4) questions about the factors that impacted permit approval, (5) questions about the factors that impacted permit denial, (6) questions about the factors that impacted permit withdrawal, and (7) a response appreciation page with a password-protected link to the survey results. Combined projects were defined as wind energy generation projects that included permission to construct a transmission line to connect the wind energy generation facility to the existing grid.

### 3.4.3 Participant Recruitment

Potential participants were recruited via purposive and snowball sampling through a variety of channels in order to achieve a sufficiently large sample that was as representative of the studied population as possible. Purposive sampling is appropriate when recruiting individuals who are particularly knowledgeable about the subject matter and may have a greater willingness to participate and communicate their experiences and opinions (Palinkas, et al., 2015).

Contact information for potential participants was collected through the following five methods: (1) contact information was collected from the individuals named in public permitting documents reviewed in the document analysis phase, then the public organization charts of their employers were consulted and contact information for additional potential participants was collected; (2) contact information was collected by consulting the CREA membership list and consulting the public organization charts of the member organizations; (3) contact information was collected by consulting the public organization charts of the provincial and federal regulatory agencies and energy boards responsible for issuing permitting decisions; (4) wind energy projects were identified by Google searches, searching public databases, and consulting lists of Canadian wind energy projects, and contact information was collected by consulting the public organization charts of the companies involved in those projects; and (5) participants were selected through a snowball method, by requesting participants forward the recruitment materials and anonymous survey link to their colleagues.

Recruitment yielded a total of 347 points of contact, without including snowball participants. Of these, 128 were considered "group" contacts, and 220 were considered "individual" contacts. Group contacts were defined as contact information or email addresses that led to social media managers, media contacts, and other collective addresses that were not attached to a single individual. Individual contacts were defined as contact information or email addresses that led to a specifically identified potential participant.

In order to ensure that the sample was as representative as possible, information about the contact's organization was collected. Contacts were grouped as: contractors or consultants, energy distributors, energy producers, federal or provincial government (not including regulators or permitting authorities), regulators, permit applicants, industry associations, NGOs, and other (for those who did not fit in any other category). These groups were created solely to ensure that a sufficient spectrum of potential participants was being recruited and were not used for coding or analysis purposes.

Once primary recruitment was complete, participants were sent an email with recruitment materials, including an information and consent letter, and an anonymous link that could be used to access the online survey. Upon providing consent to participate in the survey, participants were able to access the survey. Survey data collection took place from July 2023 to August 2023. A total of 27 participants completed the survey, with a response rate of 7.8%. However only 17 participants completed at least 40% of the survey, reducing the usable response rate to 4.9%. As there was no way to track the distribution of snowball recruitment due to the anonymized survey link, the actual response rate is likely lower. The impact of this low response rate will be discussed further in sections 4.2 and 5.3.

#### 3.4.4 Methodological Boundaries

While opinion data is inherently subjective, participants were recruited due to their high degree of expertise in the subject matter being examined. The perspectives of those who are most actively involved in these projects will yield useful insights into the legal, social, and political factors that impact wind energy transmission projects from.

Conducting semi-structured interviews with practitioners instead of or in addition to a survey was considered. However, two difficulties arose during this project that resulted in this approach being rejected. First, when approached, practitioners were hesitant to engage in interviews due to professional confidentiality concerns. Second, a survey theoretically had the ability to reach a broader and more representative sample of practitioners than a limited number of interviews. Ultimately, a survey was determined to be the appropriate choice to assess the experience of practitioners in this complex regulatory environment.

### 3.4.5 Ethics

The survey was reviewed and received ethics clearance through the University of Waterloo Research Ethics Board (REB #45193). There were no risks identified with participating in the study. The data was collected anonymously and electronically secured in accordance with University of Waterloo Research Ethics Board standards.

# Chapter 4. Results

## *4.1 Document Analysis*

Documents were intended to be analyzed using frequency counts, a quasi-quantitative method that is appropriate for content analysis (Fakis et al., 2013; Jones, 2007). A pilot review of 2-4 projects, for a total sample of approximately 12 projects, including coding decision documents and consulting permit applications and related materials in the record to provide context completed. This pilot review was completed in order to achieve two goals: (1) to ensure that the social, legal, and political factors that were identified based on prior research were valid factors, and (2) to identify any emergent social, legal, and political factors that regulators were referencing their decision documents that were not previously identified.

On completion and review of the pilot study, the results overwhelming showed that these decision documents did not detail social, legal, or political factors. Regulators instead tended to reference factors that were beyond the scope of this study, including: compliance with technical and economic standards, the satisfactory completion of Indigenous consultation and accommodation and environmental assessments by other agencies, and occasionally referenced satisfactory resolution of landowner and public notice concerns. As such, the document analysis portion of the study was suspended. The implications of the suspension of the document analysis will be discussed in section 5.2.

## 4.2 *Survey*

### 4.2.1 Sample Size

The survey received 27 responses, however, 10 of the respondents provided answers to only a few questions. In order to increase the validity of the results, only the 17 respondents who completed at least 40% of the survey were included in the analysis. Additionally, these 17 respondents did not respond to every single question, resulting in a variance in the sample size depending on the specific question being analyzed. The impact of this small sample size and its effects on the statistical power and generalizability of conclusions will be discussed in section 5.3.

### 4.2.2 Demographic information

Respondents described their current organizations as energy producers or generators (41%), contractors or consultants for energy producers or generators (12%), provincial governments (29%), NGOs (18%). Respondents' roles in the permitting process included preparing permits (n=6), reviewing permits (n=6), siting transmission line projects (n=10), siting wind energy generation projects (n=9), public outreach and consultation (n=10), advising wind energy generators (n=4) (see Figure 4). All but 2 respondents indicated they had played multiple roles in the permitting process.

Respondents worked on a variety of different transmission line projects, both with and without a nexus to wind energy, including international, interprovincial, and intraprovincial transmission lines (see Figure 5). The most common length of transmission lines projects respondents had worked on was 0-25 km (48%) (see Figure 6), and this bias toward shorter transmission lines persisted throughout questions that asked about the most common length of transmission lines that were approved, denied, or withdrawn.

Respondents worked across Canada, including Alberta (n=2), British Columbia (n=2), New Brunswick (n=2), Nova Scotia (n=4), Ontario (n=4), Prince Edward Island (n=2), Quebec (n=1), and Saskatchewan (n=5). Respondents had worked in the renewable energy field for 0-5 years (13%), 6-10 years (20%), 11-15 years (13%), 16-20 years (33%), and over 20 years (20%).

The descriptive statistics for the demographic data tend to suggest that the respondents have a breadth of knowledge and expertise in the subject matter of the survey across multiple modalities, which increases confidence in the reliability and validity of their responses to the questions regarding the factors that impact project approval, denial, and withdrawal.

#### 4.2.3 Combined wind energy generation and transmission projects

Respondents indicated that permits for transmission lines to support wind energy are sometimes combined with the permit applications for the wind energy generation installations (i.e., "combined projects"), with a mean of 6.4 (SD = 3.9) on an 11-point Likert scale. However, the results were mixed as respondents also indicated that non-combined projects are more common that combined projects, with a mean of 9.0 (SD = 3.0). While the respondents indicated that combined projects are less common than non-combined projects, the difference was not statistically significant ($p > .05$).

### 4.2.4 Factors that influence permit approval, denial, and withdrawal

The survey presented the respondents with three matrix tables, one each for permit approval, permit denial, and permit withdrawal. Each matrix table contained the same 19 social, legal, and political factors, plus an "other" catch-all category. Respondents were asked to rate each factor on an 11-point Likert scale from 0 (no effect) to 10 (guarantees permit decision). Appendix B contains a table that lists the factors that were examined, which has been edited for readability in a non-survey format. The survey prompted respondents who selected the "other" option to type in their own factor; these responses will be assessed qualitatively and commented on in the section 5.3.

For the permit approval condition, the three highest rated factors were provincial government support of the project (mean = 8.2, SD = 2.7), provincial policies supporting renewable energy projects (mean = 7.7, SD = 2.003), and community engagement in the consultation process (mean = 7.5, SD = 2.5). The three lowest rated factors were decentralized permitting process (mean = 3.5, SD = 3.0), majority Liberal representation (mean = 4.2, SD = 4.3), and majority NDP representation (mean = 4.2, SD = 4.3).

For the permit denial condition, the three highest rated factors were community engagement in the consultation process (mean = 6.6, SD = 3.2), lobbying/special interest opposition to the specific project (mean = 5.2, SD = 3.4), and lobbying/special interest opposition to wind energy (mean = 5.2, SD = 3.7). The three lowest rated factors were federal government support of the project (mean = 2.2, SD = 1.8), governmental use of expropriation to obtain land necessary for the transmission line site (mean = 2.2, SD = 2.2), and ease of siting process (mean = 2.4, SD = 1.9).

For the permit withdrawal condition, the three highest rated factors were financial viability of the project (mean = 7.7, SD = 5.1), wind energy potential (mean = 7.57, SD = 5.6), and provincial policies supporting renewable energy projects (mean = 7.6, SD = 5.6). The three lowest ranked factors were provincial government support of the project (mean = 1.0, SD = 0.0), federal government support of the project (mean = 1.0, SD = 0.0), and ease of siting process (mean = 1.0, SD = 0.0).

There were no differences in the time it took for a final permit decision across the three conditions, and respondent's indicated that the average length of time for a permit to be approved, denied, or withdrawn was 7-12 months.

### 4.2.5 Spearman's Correlation

In general, respondents indicated that each of the social, legal, and political factors they were assessing had a moderate to high impact on whether permits were approved, denied, or withdrawn. To determine the relationship of each variable within the same condition, a Spearman's correlation was performed to see which variables tended to be ranked together. The Spearman's correlation was appropriate for the data because the data was composed of paired observations, measured on a continuous scale, and exhibited a monotonic relationship.

There were a number of correlations at the 99% ($p < .01$) and 95% ($p < .05$) confidence intervals. Across all three conditions, the social factors tended to correlate with other social factors, and likewise for the political and legal factors. While these results shows that the factors are indeed measuring similar types of impact on the permitting process, thus showing the reliability of the categorization of the factors, the small sample-size restricts generalizability. The full correlation tables are located in Appendices C, D, and E.

### 4.2.6 Friedman Test

There was descriptive variation in the strength of the impact of factors between the permit approval, denial, and withdrawal conditions. To determine whether this variance was statistically significant a Friedman Test was conducted in order to compare the means of each factor in each of the three conditions. The Friedman is a non-parametric alternative to the one-way repeated measures ANOVA. The Friedman test was appropriate for this data because the data was not normal and consisted of three matched observations of the same factor across three conditions. Further, the Friedman test is especially appropriate for analyzing Likert scale data as this data—while it can be analyzed as a continuous variable—is ordinal and ranked.

There was no significant difference in the ranks of each factor between permit approval, permit denial, and permit withdrawal at a standard 95% confidence interval ($p > .05$). However, when reduced to a 90% confidence interval ($p < .1$), there was a significant difference between the three conditions for the following five factors: (1) community support for wind energy, (2) community support for the specific transmission line project, (3) provincial government support for the project, (4) federal government support for the project, and (5) ease of siting. Due to the small sample size, the statistical power of this test is low, and these findings should not be viewed as having statistical significance for the purpose of rejecting the null hypothesis or drawing generalizable conclusions. However, the results of the Friedman test still suggest that these factors may be ripe for further investigation and study.

### 4.2.7 Factors that influence public opposition

In the literature review, public opposition (including lobbying, special interests, and regulatory capture) was one of the most frequently cited barriers to wind energy development (Bohn & Lant, 2009; Coleman, 2019; Ferguson-Martin & Hill, 2011; Kassakian, 2011; Koecklin, 2021). The concerns most frequently identified as having an impact on permit denial and withdrawal were: (1) environmental concerns, (2) health a safety concerns, (3) aesthetic concerns, and (4) agricultural impacts. In contrast, economic concerns and a preference for conventional energy sources were not identified as reasons for public opposition. Agricultural impact was an emergent factor that was cited by multiple independent respondents (n = 3).

# Chapter 5. Discussion

## *5.1 Post-Research Findings Compared to Pre-Research Predictions*

It was predicted that the results of this study would conform with institutional theory (Ferguson-Martin & Hill, 2011; Lockwood, 2016), social license to operate theory (Moffat & Zhang, 2014), public values theory (Foley, 2021), and the results from previous studies conducted on the predictors of wind energy generation capacity. It was predicted that this study would expand the findings of previous research into the barriers to expanding wind energy and find that the same or substantially similar factors impact wind energy transmission line projects.

Based on a review of the literature, it was predicted that the strongest and most significant positive predictors for the success of wind energy transmission line projects would be (1) regulations that enable streamlined and centralized permitting (Klass, 2015), (2) meaningful stakeholder engagement resulting in a high level of social license to operate (Bohn & Lant, 2009; Colton, 2016; Ferguson-Martin & Hill, 2011; Langbroek & Vanclay, 2012; Stephens & Robinson, 2021), (3) public and political support of wind energy (Ferguson-Martin & Hill, 2011; Fischlein, 2010; Bohn & Lant, 2009), and (4) the existence of consistent, clear policies that support renewable energy development (Bohn & Lant, 2009; Ferguson-Martin & Hill, 2011; Menz & Vachon, 2006; Hitaj, 2013; Schumacher & Yang, 2018).

The findings of this study largely confirm and expand these prior studies, however there are a number of differences. First, this study did not find that centralized or streamlined permitting systems have a significant impact on permit approval, denial, or withdrawal. This finding may be explained by the fact that permitting in Canada is already more centralized than permitting in the United States, which is where most of the previous research into the barrier to wind energy have been conducted. Second, while many of the prior studies focused on renewable energy policies and the political will of the party in power, these factors were not found to have a significant impact on permit approval, denial, or withdrawal. Again, this finding could be explained by the different political systems in Canada and the United States. Third, this study found that while permit withdrawal seemed to be driven by financial and technical factors, permit approval or denial appeared to be driven largely by the public opinion, whether positive (leading to approval), or negative (leading to denial). On the whole, however, the findings of this study generally align with prior research.

## *5.2 Findings from the Document Analysis*

Although quasi-quantitative analysis of the documents was not possible due to the limitations of the decision documents and accompanying record, some conclusions can still be drawn from the information that was analyzed, and from the lack of information that was present. First, the lack of transparency aligns with previous research that has found it difficult to study regulatory processes, especially when the regulated entities have close ties with regulators (Fischlein, 2010; Stafford & Wilson, 2016).

In the context of the transmission line permitting process, practitioners may work for multiple entities over the course of their careers, moving between governmental and regulatory organizations and private organizations. This observation is bolstered by the demographic information of the respondents from the survey: all but 2 respondents had filled multiple, disparate roles within the permitting process over the course of their careers. These findings are consistent with institutional theory and regulatory capture (Carrigan & Coglianese, 2011; Lockwood, 2016).

On the one hand, this close association between regulators and the regulated entities can lead to a black-box effect wherein the regulatory processes are obscured from public view. On the other hand, while regulators have a duty to ensure procedural transparency with the public, they are not required to divulge every internal process or evaluation that goes into issuing a decision on the merits of the permit application.

### *5.3 Findings from the Survey*

Data from the survey indicated that the selected social, legal, and political factors do have an impact on the permitting process and may influence regulators, even when they do not cite these factors in their decision documents. One factor stood out across all permit conditions: public opposition. There is a growing body of research that has identified public opposition as one of the primary barriers to the energy transition (Bohn & Lant, 2009; Coleman, 2019; Ferguson-Martin & Hill, 2011; Foley et al., 2021 Kassakian, 2011; Koecklin et al., 2021). In the context of the permitting process, this opposition manifests as landowner and community opposition on environmental, aesthetic, and health and safety grounds. Further, multiple respondents stated that agriculture and conflict between rural and urban populations are driving some of the increases in public opposition to wind energy and transmission line projects. While there is a wealth of literature on the impact of public opposition on renewable energy generation more research still needs to be completed in order to fully understand and address this issue.

## *5.4 Public Opposition, Equity, and the Public Good*

The findings from the survey regarding the impact of public opposition align with the social license to operate and public values theories. When the public does not feel that a particular project will benefit them or their community, but they must bear the burden of the negative impacts, it is rational for the public to oppose those projects. On the other hand, one of the emergent themes that was identified in the document analysis was the need for the proposed project to benefit the public good. While these projects may benefit the public good on the provincial, national, or even international scale by contributing to the decarbonization of the energy system, they may place undue burden on communities and populations that are already experiencing a disproportionate burden. However, if proposed energy transition infrastructure projects are stymied due to the lack of a social license to operate, then higher-carbon sources of energy will continue to remain in use. As such, the burden to local communities must be balanced against the competing need to decarbonize the energy system, and delaying or denying permits that are necessary to expand wind energy generation capacity can have high costs, economically and environmentally. This raises questions of environmental justice, equity, and fairness, and indeed these issues apply to many infrastructure projects, and researchers have been seeking ways to design and evaluate best practices for appropriately weighing the competing interests of local communities and the public good. While the documents analyzed showed that regulators were making their final decisions based on the "public good," the documents and the filing manual materials did not make clear how exactly regulators were evaluating the competing interests of the local communities and broader public when making their determinations.

Manaugh et al. (2015) have noted that infrastructure planners and regulators often focus on the tangible benefits, burdens and impacts of infrastructure projects, but do not explicitly give note to intangible impacts, such a livability. Indeed, the permitting documents gave more weight to community and landowner complaints that were related to financial burdens, such as property values, and less to the impacts on livability or aesthetic concerns. On the other side, the focus on the public good was on the impact of reducing electricity rates and creating more generation capacity, rather than on the intangible benefits of a decarbonized energy system.

Future research into evaluating how permitting systems explicitly balance the competing local burdens and public interests in wind energy transmission projects can bring new insights into how regulators are approaching the concept of the public good. Researchers can build on existing frameworks from other infrastructure sectors in order to accomplish this goal. Manaugh et al. (2015) urge focusing on explicit inclusion of social equity as part of the infrastructure planning process, and this could be incorporated into the permitting process for wind energy transmission line projects.

### *5.5 Social License to Operate and Community Engagement*

One of the best ways to be granted a social license to operate is by engaging openly and transparently with the affected populations (Bohn & Lant, 2009). If regulators and energy producers engage with the affected populations then they can build consensus models with public buy-in and enthusiasm (Bohn & Lant, 2009). Social license to operate theory aligns with the truism that people simply want their voices to be heard and their concerns to matter.

The findings from this study align with prior research that has found that public acceptance and citizen co-investment in infrastructure projects, including wind energy projects, leads to faster permitting and construction processes and fewer objections and opposition from the impacted community (Knauf & Wüstenhagen, 2023). For example, Knauf and Wüstenhagen (2023) found that co-investment offers for impacted communities during the permitting and land acquisition stages of a project were effective ways for wind energy developers to garner public acceptance and secure a social license to operate.

In addition to co-investment, which can place a financial burden on the project proponent, community engagement and relationship building has been shown to decrease public opposition (Koya, et al., 2021; Zhang et al., 2018). Researchers have found that relational engagement with stakeholders and affected communities was associated with securing a social license to operate and a decrease in local opposition to the project. For example, Zhang et al. (2018) found that providing information in an initial engagement letter to affected community members, effectively communicating community engagement plans, and communicating government permitting processes increased perceptions of procedural fairness and decreased public opposition, thus increasing social acceptance of the project. Hall (2014) found that the social aspects of public opposition to wind energy projects are diverse and complicated: when opposition is based on poor consultation and insufficient information, consultation, engagement, and sharing information decreased opposition; however, when opposition was due to embedded or deeply entrenched beliefs, these tactics where not as effective.

While project proponents play a large role in engaging the public, regulators also have a part to play in this exchange. Regulators act as mediators between project proponents and individuals who raise objections to the project, and they can use similar tools to impact the perceived procedural fairness of the objection and appeal process. Additionally, Koya et al. (2021) raised the issue of how communities can participate in their own governance and take ownership of projects in their region. The authors cautioned that when the project proponent has considerable influence and power over the community where project is being constructed—such as in the case of wind energy transmission lines being constructed by vertically integrated utilities—regulators should engage in an outcome assessment and determine whether the project has a beneficial societal impact.

In sum, researchers have found that project proponents and regulators can address public concerns through community engagement, building relationships with local stakeholders, addressing the concerns of impacted communities and individuals, ensuring procedural fairness, and offering co-investment options. Further research can examine in further detail the interaction between the permitting process, community opposition, community engagement, and social license to operate within the context of wind energy transmission line projects.

### *5.6 Avenues for Further Research*

This study was broad survey of the social, legal, and political factors that impact the permitting process. As such, it was not designed to take an in-depth look at any of the single factors that impact this process. Further research in this area can look at each factor in isolation or in smaller groups to determine the precise impact each factor has on the permitting process. Further, due to the small sample-size impacting the ability to make generalizable conclusions, further research in this area could confirm or deny the findings of this study.

Because public opposition—especially the rural vs. urban divide—was found to be a recurring factor that impacted permitting across both the survey and the document analysis, researchers should further examine these processes and their relationship to social license to operate theory. Indeed, Knauf & Wüstenhagen (2023) investigated developers' approaches to public consultation processes and found that, in keeping with the social license to operate theory, social acceptance was the key driver of citizen co-investment in wind energy projects. Lessons can also be learned from international partners and their development of best practices (Maleki-Dizaji, 2020), and investigating whether they are applicable in a Canadian context.

Although investigating environmental assessments and the Indigenous consultation and accommodation processes were outside the scope of this study, investigating how these processes relation to this issue is another important avenue for further research. Indeed, a number of researchers are investigating those issues in the context of expanding transmission capacity for wind energy. Nwanekezie et al. (2022) engaged in a case study of renewable energy development in Saskatchewan through a transitions-based strategic environmental assessment approach. Mang-Benza and Baxter (2021) examined the lived experience an Indigenous community that lives with wind turbines by conducting semi-structured interviews of individuals within the M'Chigeeng First Nation in Ontario, an Indigenous community who owns and operates two wind turbines.

Researchers can also examine or propose frameworks for expedited permitting systems or engage in studies of novel approaches to the interplay of wind generation and transmission capacity, and some researchers have already begun this line of inquiry. For example, Danapour et al. (2022) have investigated integrating wind turbines into transmission lines, thus creating a combined structure that generates and transports electricity. To the extent that combined projects may simplify the permitting process, Moradi-Sepahvand and Amraee (2023) have created a multi-stage expansion model for planning wind energy generation, transmission, and storage in one package.

## 5.7 Conclusion

It is my hope that the findings of this study will (1) provide practical information to practitioners, project leaders, government actors, and relevant stakeholders and professionals as they seek to complete future wind energy transmission projects; (2) provide information on the relative influence of social, legal, and political factors on wind energy transmission projects for researchers and academics in the field; and (3) contribute to the study of the electricity infrastructure, climate mitigation through increased renewable energy generation capacity, and the transformation of the global energy economy.

## References


Andersen, A. D. (2014). No transition without transmission: HVDC electricity infrastructure as an enable for renewable energy? *Environmental Innovation and Societal Transitions*, *13*, 75-96. https://dx.doi.org/10.1016/j.eist.2014.09.004

Baringo, L., & Conejo, A. J. (2012). Transmission and wind power investment. *IEEE Transaction on Power Systems*, *27*(2), 885-893.

Bird, L., Bolinger, M., Gagliano, T., Wiser, R., Brown, M., & Parsons, B. (2005). Policies and market factors driving wind power development in the United States. *Energy Policy*, *33*, 1397-1407. https://doi.org/10.1016/j.enpol.2003.12.018

Bohn, C., & Lant, C. (2009) Welcoming the Wind? Determinants of Wind Power Development Among U.S. States. *The Professional Geographer*, *61*(1), 87-100. https://doi.org/10.1080/00330120802580271

Bolden, R., & Moscarola, J. (2000). Bridging the quantitative-qualitative divide: The lexical approach to textual data analysis. *Social Science Computer Review*, *18*(4), 450–460. https://doi.org/10.1177/089443930001800408

Boutilier, R. G. (2017). A measure of the social license to operate for infrastructure and extractive projects. http://doi.org/10.2139/ssrn.3204005

Boutilier, R. G., & Thomson, I. (n.d.) Modelling and measuring the social license to operate: Fruits of a dialogue between theory and practice. https://socialicense.com/publications/Modelling%20and%20Measuring%20the%20SLO.pdf

Bozeman, B. (2009). Public values theory: Three big questions. *International Journal of Public Policy*, *4*(50), 369-375. https://doi.org/10.1504/IJPP.2009.025077

Canada Energy Regulator. (2020). Electricity Filing Manual. https://www.cer-rec.gc.ca/en/applications-hearings/submit-applications-documents/filing-manuals/electricity-filing-manual/electricity-filing-manual.pdf

Canada Energy Regulator. (2023). Market Snapshot: Record-high Canadian electricity export revenue in 2022. https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2023/market-snapshot-record-high-canadian-electricity-export-revenue-2022.html

Canadian Renewable Energy Association. (2024). Wind Energy. https://renewablesassociation.ca/wind-energy/

Carrigan, C., & Coglianese, C. (2011). The politics of regulation: From new institutionalism to new governance. *Annual Review of Political Science, 14*(1), 107-129. https://doi.org/10.1146/annurev.polisci.032408.171344

Christian, J., & Shipley, L. (2020). Electricity regulation in Canada: Overview. *Practical Law Country Q&A*, 5-632-4326.

Coleman, J. W. (2019). Pipelines & Power-lines: Building the Energy Transport Future. Ohio State Law Journal, 80, 263-285. https://ssrn.com/abstract=3172652

Coleman, J. W., & Klass, A. B. (2019). Energy and eminent domain. *Minnesota Law Review, 104*(2), 659-739. https://minnesotalawreview.org/article/energy-and-eminent-domain/

Colton, J., Corscadden, K., Fast, S., Gattinger, M., Gehman, J., Hall Findlay, M., Morgan, D., Sayers, J., Winter, J., & Yatchew, A. (2016). Energy projects, social licence, public acceptance and regulatory systems in Canada: A white paper. School of Public Policy Publications, 9. https://doi.org/DOI:10.11575/sppp.v9i0.42589

Creswell, J. W., & Creswell, J. D. (2018). Research Design: Qualitative, Quantitative and Mixed Methods (5th ed.). Sage Publishing.

Danapour, N., Hagh, M., & Hosseini, S. (2022). Integrated wind turbines and power transmission line: A novel concept. *Sustainable Energy Technologies and Assessments, 52*(B). https://doi.org/10.1016/j.seta.2022.102174

Dare, M. (Lain), Schirmer, J., & Vanclay, F. (2014). Community engagement and social licence to operate. *Impact Assessment and Project Appraisal, 32*(3), 188–197. https://doi.org/10.1080/14615517.2014.927108

De Bruijne, M., & Wijnant, A. (2015). Improving response rates and questionnaire design for mobile web surveys. *Public Opinion Quarterly*, *78*(4), 951-962. https://doi.org/10.1093/poq/nfu046

Deep Decarbonization Pathways Project. (2015). *Pathways to deep decarbonization 2015 report*. SDSN, IDDRI. https://www.iddri.org/sites/default/files/import/publications/ddpp_2015synthetisreport.pdf

Delmas, M., & Toffel, M. (2004). Stakeholders and environmental management practice: an institutional framework. *Business Strategy and the Environment*, *13*, 209-222.

Diogenes, J. R. F., Claro, J., Rodrigues, J. C., & Valentim Loureiro, M. (2020). Barriers to onshore wind energy implementation: A systematic review. *Energy Research & Social Science, 60*, 101337. https://doi.org/10.1016/j.erss.2019.101337

Directorate-General for Climate Action. (2024). Record reduction of 2023 ETS emissions due largely to boost in renewable energy. *Energy, Climate Change, Environment*. https://climate.ec.europa.eu/news-your-voice/news/record-reduction-2023-ets-emissions-due-largely-boost-renewable-energy-2024-04-03_en

Ela, E., Milligan, M., & Kirby, B. (2011). Operating Reserves and Variable Generation. National Renewable Energy Lab, NREL/TP-5500-51978. https://www.nrel.gov/docs/fy11osti/51978.pdf

Electricity produced from certain renewable resources, etc., 26 USC § 45 (2018).

Energy Information Administration. (2020). Wind explained: Electricity generation from wind. https://www.eia.gov/energyexplained/wind/electricity-generation-from-wind.php

Fakis, A., Hilliam, R., Stoneley, H., & Townend, M. (2014). Quantitative analysis of qualitative information from interviews: A systematic literature review. *Journal of Mixed Methods Research, 8*(2), 139–161. https://doi.org/10.1177/1558689813495111

Faulkner, N., & Kaufman, S. (2017). Avoiding theoretical stagnation: A systematic review and framework for measuring public value. *Australian Journal of Public Administration, 77*(1), 69-86. https://doi.org/10.1111/1467-8500.12251

Ferguson-Martin, C. J., & Hill, S. D. (2011). Accounting for variation in wind deployment between Canadian provinces. *Energy Policy, 39*(3), 1647-1658. https://doi.org/10.1016/j.enpol.2010.12.040

Fischlein, M., Larson, J., Hall, D. M., Chaudhry, R., Peterson, T. R., Stephens, J. C., & Wilson, E. J. (2010). Policy stakeholders and deployment of wind power in the sub-national context: A comparison of four U.S. states. *Energy Policy*, *38*, 4429-4439. https://doi.org/10.1016/j.enpol.2010.03.073

Foley, R. W., Pollack, C. C., Barrella, E., & Wilkins, R. (2021). How public values theory can influence energy infrastructure planning: Exploring values articulation, time horizons, and substitutability through the Atlantic coast pipeline. Energy Research & Social Science, 72, 101836. https://doi.org/10.1016/j.erss.2020.101836

Fukumoto, E., & Bozeman, B. (2019). Public values theory: What is missing? *The American Review of Public Administration, 49*(6), 635–648. https://doi.org/10.1177/0275074018814244

Hall, N. (2014). Can the "Social Licence to Operate" Concept Enhance Engagement and Increase Acceptance of Renewable Energy? A Case Study of Wind Farms in Australia. *Social Epistemology*, *28*(3-4), 219-238. https://doi.org/10.1080/02691728.2014.922636

Harpe, S. (2015). How to analyze Likert and other rating scale data. *Currents in Pharmacy Teaching and Learning*, *7*(6), 836-850. https://doi.org/10.1016/j.cptl.2015.08.001

Hitaj, C. (2013). Wind power development in the United States. *Journal of Environmental Economics and Management*, *65*(3), 394-410. https://doi.org/10.1016/j.jeem.2012.10.003

Hoppock, D. C., & Patiño-Echeverri, D. (2010). Cost of wind energy: Comparing distant wind resources to local resources in the midwestern United States. *Environmental Science & Technology*, *44*, 8758-8765. https://doi.org/10.1021/es100751p

International Energy Association. (2023). Grid-scale Storage. https://www.iea.org/energy-system/electricity/grid-scale-storage

IPCC. (2014). Climate change 2014: Mitigation of climate change, contribution of working group III. *Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Edenhofer, O., Pichs-Madruga, R., Sokona, Y., Farahani, E., Kadner, S., Seyboth, K., Adler, A., Baum, I., Brunner, S., Eickemeier, P., Kriemann, B., Savolainen, J., Schlömer, S., von Stechow, C., Zwickel, T., & Minx, J. C. (Eds.)). https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf

Jehling, M., Hitzeroth, M., Brueckner, M. (2019). Applying institutional theory to the analysis of energy transitions: From local agency to multi-scale configurations in Australia and Germany. *Energy Research & Social Science, 53*, 110-120. https://doi.org/10.1016/j.erss.2019.01.018

Jones, ML (2007). Using software to analyse qualitative data. *Malaysian Journal of Qualitative Research, 1*(1), 64-76.

Jorgensen, J., Denholm, P., & Mai, T. (2018). Analyzing storage for wind integration in a transmission-constrained power system. *Applied Energy, 228*, 122-129. https://doi.org/10.1016/j.apenergy.2018.06.046

Kassakian, J.G., Schmalensee, R., Desgroseilliers, G., Heidel, T. D., Afridi, K., Farid, A. M., Grochow, J. M., Hogan, W. W., Jacoby, H. D., Kirtley, J. L., Michaels, H. G., Perez-Arriaga, I., Perreault, D. G., Rose, N. L., & Wilson, G. L. (2011). The future of the electric grid: An interdisciplinary MIT study. *Massachusetts Institute of Technology*. http://energy.mit.edu/wp-content/uploads/2011/12/MITEI-The-Future-of-the-Electric-Grid.pdf

Klass, A. B. (2015). The electric grid at a crossroads: A regional approach to siting transmission lines. U.C. Davis Law Review, 45(5), 1895-1954. https://lawreview.law.ucdavis.edu/issues/48/5/Articles/48-5_Klass.pdf

Knauf, J., & Wüstenhagen, R. (2023). Crowdsourcing social acceptance: Why, when and how project developers offer citizens to co-invest in wind power. *Energy Policy, 173*. https://doi.org/10.1016/j.enpol.2022.113340

Koecklin, M., Longoria, G., Fitiwi, D., DeCarolis, J., & Curtis, J. (2021). Public acceptance of renewable electricity generation and transmission network developments: Insights from Ireland. *Energy Policy, 151*. https://doi.org/10.1016/j.enpol.2021.112185

Koya, N., Hurst, B., & Roper, J. (2021). In whose interests? When relational engagement to obtain a social license leads to paradoxical outcomes. *Public Relations Review*, *47*(1). https://doi.org/10.1016/j.pubrev.2020.101987

Laird, F. N., & Stefes, C. (2009). The diverging paths of German and United States policies for renewable energy: Sources of difference. *Energy Policy*, *37*(7), 2619-2629. https://doi.org/10.1016/j.enpol.2009.02.027

Langbroek, M., & Vanclay, F. (2012). Learning from the social impacts associated with initiating a wind farm near the former island of Urk, The Netherlands. Impact Assessment and Project Appraisal, 30(3), 167-178. https://doi.org/10.1080/14615517.2012.706943

Lietz, P. (2010). Research into questionnaire design: A summary of the research. *International Journal of Market Research*, *52*(2), 249-272. https://doi.org/10.2501/S147078530920120X

Lockwood, M., Kuzemko, C., Mitchell, C., & Hoggett, R. (2016). Historical institutionalism and the politics of sustainable energy transitions: A research agenda. *Environment and Planning C: Politics and Space*, *35*(2), 312-333. https://doi.org/10.1177/0263774X16660561

Maleki-Dizaji, P., del Bufalo, N., Di Nucci, M., & Krug, M. (2020). Overcoming Barriers to the Community Acceptance of Wind Energy: Lessons Learnt from a Comparative Analysis of Best Practice Cases across Europe. *Sustainability, 12*(9). https://doi.org/10.3390/su12093562

Managuh, K., Badami, M., & El-Geneidy, A. (2015). Integrating social equity into urban transportation planning: A critical evaluation of equity objectives and measures in transportation plans in North America. *Transport Policy, 37*, 167-176. http://dx.doi.org/10.1016/j.tranpol.2014.09.013

Mang-Benza, C., & Baxter, J. (2021). Not paid to dance at the powwow: Power relations, community benefits, and wind energy in M'Chigeeng First Nation, Ontario, Canada. *Energy Research & Social Science, 82*. https://doi.org/10.1016/j.erss.2021.102301

Menz, F. C., & Vachon, S. (2006). The effectiveness of different policy regimes for promoting wind power: Experiences from the states. Energy Policy, 34, 1786-1796. https://doi.org/10.1016/j.enpol.2004.12.018

Moffat, K., & Zhang, A. (2014). The paths to social licence to operate: An integrative model explaining community acceptance of mining. Resources Policy, 39, 61-70. https://doi.org/10.1016/j.resourpol.2013.11.003

Moore, M. H. (1995). *Creating Public Value: Strategic Management in Government.* Harvard University Press.

Moradi-Sepahvand, M., & Amraee, T. (2023). Secure expansion of energy storage and transmission lines considering bundling option under renewable penetration. *Applied Energy, 347*. https://doi.org/10.1016/j.apenergy.2023.121414

Natural Resources Canada. (2020). Renewable energy facts. https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/renewable-energy-facts/20069

Noel, W., Weis, T., Qiulin, Y., Leach, A., & Fleck, B. (2022). Mapping the evolution of Canada's wind energy fleet. *Renewable and Sustainable Energy Reviews*, *167*. https://doi.org/10.1016/j.rser.2022.112690

Nwanekezie, K., Noble, B., & Poelzer, G. (2022). Strategic assessment for energy transitions: A case study of renewable energy development in Saskatchewan, Canada. *Environmental Impact Assessment Review, 92*. https://doi.org/10.1016/j.eiar.2021.106688

Office of Research Ethics. (n.d.). University of Waterloo. https://uwaterloo.ca/research/office-research-ethics

Palinkas, L., Horwitz, S., Green, C., Wisdom, J., Duan, N., & Hoagwood, K. (2015) Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Administration and Policy in Mental Health and Mental Health Services Research*, *42*, 533-544. https://doi.org/10.1007/s10488-013-0528-y

Panel on Research Ethics. (2021). The TCPS 2 Tutorial Course on Research Ethics (CORE). https://ethics.gc.ca/eng/education_tutorial-didacticiel.html

Paris Agreement, December 12, 2015. https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

Schumacher, K., & Yang, Z. (2018). The determinants of wind energy growth in the United States: Drivers and barriers to state-level development. *Renewable and Sustainable Energy Reviews*, *97*, 1-13. https://doi.org/10.1016/j.rser.2018.08.017

Srnka, K.J., Koeszegi, S.T. (2007). From words to numbers: How to transform qualitative data into meaningful quantitative results. *Schmalenbach Business Review 59*, 29–57 (2007). https://doi.org/10.1007/BF03396741

Stafford, B. A., & Wilson, E. J. (2016). Winds of change in energy systems: Policy implementation, technology deployment, and regional transmission organizations. *Energy Policy, 21*, 222-236. https://doi.org/10.1016/j.erss.2016.08.001

Statistical Consulting and Collaborative Research Unit. (n.d.). Welcome to Statistical Consulting and Collaborative Research Unit. University of Waterloo. https://uwaterloo.ca/statistical-consulting-and-collaborative-research-unit/

Statistics Canada. (2023). Harnessing the power of the wind and the sun. https://www.statcan.gc.ca/o1/en/plus/3779-harnessing-power-wind-and-sun

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research, and Evaluation, 7*(17). https://doi.org/10.7275/z6fm-2e34

Stephens, S., & Robinson, B. M. K. (2021). The social license to operate in the onshore wind energy industry: A comparative case study of Scotland and South Africa. Energy Policy, 148(B), 111981. https://doi.org/10.1016/j.enpol.2020.111981

United Nations. (2015). *Transforming our world: the 2030 agenda for sustainable development*, A/RES/70/1. https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf

United Nations Economic Commission for Europe. (2021). Carbon neutrality in the UNECE region: Integrated life-cycle assessment of electricity sources. https://unece.org/sites/default/files/2022-04/LCA_3_FINAL%20March%202022.pdf

Vortex. (2019). Canada wind mean speed map. https://vortexfdc.com/knowledge/wind-map-canada/

Williams, I., & Shearer, H. (2011). Appraising public value: Past, present and futures. *Public Administration, 89*(4), 1367-1384. https://doi.org/10.1111/j.1467-9299.2011.01942.x

Wind Exchange (n.d.). U.S. average annual wind speed at 80 meters. National Renewable Energy Lab. https://windexchange.energy.gov/maps-data/319

Wood, M., & Thistlethwaite, J. (2018). Social license to operate (SLO): Case review of enbridge and the Northern gateway pipeline. In Marques, J. (ed.), *Handbook of Engaged Sustainability* (579-601). Springer International.

Zhang, A., Meashan, T., & Moffat, K. (2018). Preconditions for social licence: The importance of information in initial engagement. *Journal of Cleaner Production*, *172*, 1559-1566. https://doi.org/10.1016/j.jclepro.2017.10.323

# Appendices

## *Appendix A: Questionnaire Text*

### Introductory Information

Q2.1 This section will ask questions about your professional role and history in the wind energy and transmission line field.

Q2.2 What best describes your organization?

- ○ Energy producer
- ○ Contractor or consultant for energy producer
- ○ Construction firm
- ○ Federal government
- ○ Provincial government
- ○ Industry association
- ○ Non-governmental organization
- ○ Other, please specify:

Q2.3 What is your current and/or previous role(s) in the wind energy transmission line permitting process? (Please select all that apply)

- Preparing permits
- Reviewing permits
- Siting transmission line projects
- Siting wind energy projects
- Public outreach and consultation
- Advising energy wind producers
- Other, please specify:

Q2.4 What is your current or most recent **primary** role in the wind energy transmission line permitting process?

- ○ Preparing permits
- ○ Reviewing permits

- ○ Siting transmission line projects
- ○ Siting wind energy projects
- ○ Public outreach and consultation
- ○ Advising energy wind producers
- ○ Other, please specify:

Q2.5 What types of wind energy transmission line projects have you been involved in? (Please select all that apply)

- International, 100% of electricity from wind energy sources
- International, more than 50% of electricity from wind energy sources
- International, less than 50% of electricity from wind energy sources
- Interprovincial, 100% of electricity from wind energy sources
- Interprovincial, more than 50% of electricity from wind energy sources
- Interprovincial, less than 50% of electricity from wind energy sources
- Intraprovincial, 100% of electricity from wind energy sources
- Intraprovincial, more than 50% of electricity from wind energy sources
- Intraprovincial, less than 50% of electricity from wind energy sources
- Other, please specify:

Q2.6 What lengths of transmission line projects have you worked on? (Please select all that apply)

- 0-25 km
- 26-50 km
- 51-100 km
- 100-200 km
- 200-500 km
- 500-1000 km
- 1000+ km

Q2.7 What is the most common length of the transmission line project you have worked on?

- ○ 0-25 km
- ○ 26-50 km
- ○ 51-100 km
- ○ 100-200 km

- ○ 200-500 km
- ○ 500-1000 km
- ○ 1000+ km

Q2.8 Where have the projects you have worked on been located? (Select all that apply)

- Alberta
- British Columbia
- Manitoba
- New Brunswick
- Newfoundland and Labrador
- Northwest Territories
- Nova Scotia
- Nunavut
- Ontario
- Prince Edward Island
- Quebec
- Saskatchewan
- Yukon
- United States of America, please specify which state(s) or territory(s):
- International, please specify which country(s):

Q2.9 How long have you worked in the renewable energy field?

- ○ 0-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16-20 years
- ○ 20+ years

## Combined Projects

Q3.1 This section will ask about permits for wind energy generation projects that also include permission to construct a transmission line to connect the wind energy generation facility to the existing grid (i.e., combined projects).

Q3.2.1 How often do permits for wind energy generation projects include permission to construct a transmission line to connect the wind energy generation facility to the existing grid?

| 0 = never | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 = always | Do not know |
|---|---|---|---|---|---|---|---|---|---|---|---|

Q3.2.2 How often do transmission lines to connect new wind energy generation facilities to the existing grid require a separate permit?

| 0 = never | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 = always | Do not know |
|---|---|---|---|---|---|---|---|---|---|---|---|

Q3.3 When a permit for a wind energy generation facility includes permission to construct a transmission line, what is the most common length of the transmission line?

- ○ 0-10 km
- ○ 11-20 km
- ○ 21-30 km
- ○ 31-40 km
- ○ 41- 50 km
- ○ 50 + km, please specify:

## Factors that Contribute to Permit Approval

Q4.1 This section will ask questions about the factors that contribute to the approval of transmission line projects permits, including the transmission portion of combined projects.

Q4.2 What impact did each of the following factors have on permit approval?

- ○ See Appendix B

Q4.3 On average, how long after submission does it take for a permit to be approved?

- ○ 0-6 months
- ○ 7-12 months
- ○ 1-1.5 years
- ○ 1.5-2 years
- ○ 2-2.5 years
- ○ 3+ years
  - ■ If more than 3 years, please specify:

Q4.4 What is the average length of an approved transmission line?

- ○ 0-25 km
- ○ 26-50 km
- ○ 51-100 km
- ○ 100-200 km
- ○ 200-500 km
- ○ 500-1000 km
- ○ 1000+ km

Q4.5 Do you have any further comments on factors that contribute to permit approval?

## Factors that Contribute to Permit Denial

Q5.1 This section will ask questions about the factors that contribute to the denial of transmission line project permits, including the transmission portion of combined projects.

Q5.2 What impact did each of the following factors have on permit approval?

- ○ See Appendix B

Q5.3 If public opposition (including local communities, lobbying, or special interests) contributed to permit denial, what were the reason(s) for the public opposition? (Select all that apply):

- Aesthetic concerns
- Environmental concerns
- Health and safety concerns
- Preference for conventional energy sources
- Economic concerns
- Other, please specify:

Q5.4 If public opposition (including local communities, lobbying, or special interests) contributed to permit denial, what was the most common reason for public opposition? (Select only one)

- ○ Aesthetic concerns
- ○ Environmental concerns
- ○ Health and safety concerns
- ○ Preference for conventional energy sources
- ○ Economic concerns
- ○ Other, please specify:

Q5.5 On average, how long after submission does it take for a permit to be denied?

- ○ 0-6 months
- ○ 7-12 months
- ○ 1-1.5 years
- ○ 1.5-2 years
- ○ 2-2.5 years
- ○ 3+ years

- If more than 3 years, please specify:

Q5.6 What is the average length of a denied transmission line?

- ○ 0-25 km
- ○ 26-50 km
- ○ 51-100 km
- ○ 100-200 km
- ○ 200-500 km
- ○ 500-1000 km
- ○ 1000+ km

Q5.7 Do you have any further comments on factors that contribute to permit denial?

## Factors that Contribute to Permit Withdrawal

Q6.1 This section will ask questions about the factors that contribute to the voluntary withdrawal of transmission line project permits, including the transmission portion of combined projects.

Q6.2 What impact did each of the following factors have on permit withdrawal?

- ○ See Appendix B

Q 6.3 If public opposition (including local communities, lobbying, or special interests) contributed to permit withdrawal, what were the reason(s) for the public opposition? (Select all that apply):

- Aesthetic concerns
- Environmental concerns
- Health and safety concerns
- Preference for conventional energy sources
- Economic concerns
- Other, please specify:

Q6.4 If public opposition (including local communities, lobbying, or special interests) contributed to permit withdrawal, what was the most common reason for public opposition? (Select only one)

- ○ Aesthetic concerns
- ○ Environmental concerns
- ○ Health and safety concerns
- ○ Preference for conventional energy sources
- ○ Economic concerns
- ○ Other, please specify:

Q6.5 How often were permits withdrawn because denial was anticipated?

| 0 = never | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 = always | Do not know |
|---|---|---|---|---|---|---|---|---|---|---|---|

Q6.6 On average, how long after submission does it take for a permit to be withdrawn?

- ○ 0-6 months
- ○ 7-12 months
- ○ 1-1.5 years
- ○ 1.5-2 years
- ○ 2-2.5 years
- ○ 3+ years
  - ■ If more than 3 years, please specify:

Q6.7 What is the average length of the transmission line for a withdrawn project?

- ○ 0-25 km
- ○ 26-50 km
- ○ 51-100 km
- ○ 100-200 km
- ○ 200-500 km
- ○ 500-1000 km
- ○ 1000+ km

Q6.8 Do you have any further comments on factors that contribute to permit denial?

## Conclusion

Q7.1 Do you have any other comments or information you would like to share?

## *Appendix B: Edited Matrix Table for Questions Q4.2, Q5.2, and Q6.2*

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Do not know |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Community engagement in consultation process | | | | | | | | | | | | |
| Community support for wind energy | | | | | | | | | | | | |
| Lobbying/special interest opposition to wind energy | | | | | | | | | | | | |
| Lobbying/special interest opposition to the specific transmission line project | | | | | | | | | | | | |
| Provincial government support of the project | | | | | | | | | | | | |
| Federal government support of the project | | | | | | | | | | | | |
| Ease of siting process | | | | | | | | | | | | |
| Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | | | | | | | | | | | | |
| Ease of permitting process | | | | | | | | | | | | |
| Centralized permitting process | | | | | | | | | | | | |
| Decentralized permitting process | | | | | | | | | | | | |
| Provincial policies supporting renewable energy projects | | | | | | | | | | | | |
| Federal policies supporting renewable energy projects | | | | | | | | | | | | |
| Majority Conservative Party representation | | | | | | | | | | | | |
| Majority Liberal Party representation | | | | | | | | | | | | |
| Majority New Democratic Party (NDP) representation | | | | | | | | | | | | |
| Wind energy potential | | | | | | | | | | | | |
| Economic viability of project | | | | | | | | | | | | |
| Other, please specify: | | | | | | | | | | | | |

# *Appendix C: Spearman's Correlation: Factors that Impact Permit Approval*

**Correlation Table: Factors that impact permit approval**

| | | | Community engagement in consultation process | Community support for wind energy | Community support for the specific transmission line project | Lobbying/special interest opposition to wind energy | Lobbying/special interest opposition to the specific transmission line project | Provincial government support of the project | Federal government support of the project | Ease of siting process | Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | Ease of permitting process | Centralized permitting process | Decentralized permitting process | Provincial policies supporting renewable energy projects | Federal policies supporting renewable energy projects | Majority Conservative Party representation | Majority Liberal Party representation | Majority New Democratic Party (NDP) representation | Wind energy potential | Economic viability of project |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spearman's rho | Community engagement in consultation process | Correlation Coefficient | -- | | | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | . | | | | | | | | | | | | | | | | | | |
| | | N | 10 | | | | | | | | | | | | | | | | | | |
| | Community support for wind energy | Correlation Coefficient | .156 | -- | | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .689 | . | | | | | | | | | | | | | | | | | |
| | | N | 9 | 10 | | | | | | | | | | | | | | | | | |
| | Community support for the specific transmission line project | Correlation Coefficient | .577 | .471 | -- | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .081 | .200 | . | | | | | | | | | | | | | | | | |
| | | N | 10 | 9 | 10 | | | | | | | | | | | | | | | | |
| | Lobbying/special interest opposition to wind energy | Correlation Coefficient | .153 | .723* | .078 | -- | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .695 | .018 | .843 | . | | | | | | | | | | | | | | | |
| | | N | 9 | 10 | 9 | 10 | | | | | | | | | | | | | | | |
| | Lobbying/special interest opposition to the specific transmission line project | Correlation Coefficient | .056 | .533 | .026 | .962** | -- | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .887 | .140 | .947 | <.001 | . | | | | | | | | | | | | | | |
| | | N | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | | |
| | Provincial government support of the project | Correlation Coefficient | -.313 | -.498 | .051 | -.658 | -.527 | -- | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .412 | .173 | .896 | .054 | .179 | . | | | | | | | | | | | | | |
| | | N | 9 | 9 | 9 | 9 | 8 | 10 | | | | | | | | | | | | | |
| | Federal government support of the project | Correlation Coefficient | .065 | .113 | .433 | -.097 | -.158 | .098 | -- | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .869 | .791 | .244 | .819 | .709 | .802 | . | | | | | | | | | | | | |
| | | N | 9 | 8 | 9 | 8 | 8 | 9 | 9 | | | | | | | | | | | | |
| | Ease of siting process | Correlation Coefficient | .183 | -.038 | .525 | .210 | .321 | .075 | .273 | -- | | | | | | | | | | | |
| | | Sig. (2-tailed) | .665 | .928 | .182 | .618 | .438 | .861 | .512 | . | | | | | | | | | | | |
| | | N | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | |
| | Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | Correlation Coefficient | .502 | .533 | .981** | .193 | .138 | -.111 | .454 | .321 | -- | | | | | | | | | | |
| | | Sig. (2-tailed) | .251 | .218 | <.001 | .679 | .769 | .813 | .307 | .483 | . | | | | | | | | | | |
| | | N | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | |
| | Ease of permitting process | Correlation Coefficient | .391 | .304 | .547 | .405 | .405 | -.222 | .605 | .805* | .396 | -- | | | | | | | | | |
| | | Sig. (2-tailed) | .338 | .464 | .161 | .320 | .320 | .597 | .112 | .016 | .379 | . | | | | | | | | | |
| | | N | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | | | | | | | | | |
| | Centralized permitting process | Correlation Coefficient | .281 | .636 | .806 | -.045 | -.134 | -.090 | .299 | .299 | .806 | .375 | -- | | | | | | | | |
| | | Sig. (2-tailed) | .589 | .174 | .053 | .933 | .800 | .866 | .565 | .565 | .053 | .464 | . | | | | | | | | |
| | | N | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | |
| | Decentralized permitting process | Correlation Coefficient | .563 | .727 | .716 | .313 | .134 | -.582 | .672 | .313 | .627 | .750 | .727 | -- | | | | | | | |
| | | Sig. (2-tailed) | .245 | .101 | .109 | .545 | .800 | .225 | .144 | .545 | .183 | .086 | .101 | . | | | | | | | |
| | | N | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | |
| | Provincial policies supporting renewable energy projects | Correlation Coefficient | .548 | -.212 | .649 | -.485 | -.428 | .442 | .253 | .529 | .609 | .410 | .906* | .667 | -- | | | | | | |
| | | Sig. (2-tailed) | .127 | .583 | .058 | .186 | .290 | .201 | .511 | .178 | .147 | .313 | .013 | .148 | . | | | | | | |
| | | N | 9 | 9 | 9 | 9 | 8 | 10 | 9 | 8 | 7 | 8 | 6 | 6 | 10 | | | | | | |
| | Federal policies supporting renewable energy projects | Correlation Coefficient | .555 | .506 | .708* | .212 | .103 | -.298 | .607 | .292 | .844* | .580 | .508 | .806 | .280 | -- | | | | | |
| | | Sig. (2-tailed) | .121 | .200 | .033 | .614 | .808 | .436 | .083 | .483 | .017 | .132 | .304 | .053 | .466 | . | | | | | |
| | | N | 9 | 8 | 9 | 8 | 8 | 9 | 9 | 8 | 7 | 8 | 6 | 6 | 9 | 9 | | | | | |
| | Majority Conservative Party representation | Correlation Coefficient | -.344 | -.460 | -.351 | -.308 | -.308 | .308 | .975** | -.158 | -.632 | .205 | -.389 | .105 | -.026 | .000 | -- | | | | |
| | | Sig. (2-tailed) | .571 | .436 | .562 | .614 | .614 | .614 | .005 | .800 | .368 | .741 | .611 | .895 | .966 | 1.000 | . | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | | | | |
| | Majority Liberal Party representation | Correlation Coefficient | .574 | .460 | .351 | .564 | .564 | -.564 | .564 | .526 | .105 | .975** | .389 | .949 | .237 | .816 | .395 | -- | | | |
| | | Sig. (2-tailed) | .312 | .436 | .562 | .322 | .322 | .322 | .322 | .362 | .895 | .005 | .611 | .051 | .701 | .092 | .511 | . | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | | | |
| | Majority New Democratic Party (NDP) representation | Correlation Coefficient | .574 | .460 | .351 | .564 | .564 | -.564 | .564 | .526 | .105 | .975** | .389 | .949 | .237 | .816 | .395 | 1.000** | -- | | |
| | | Sig. (2-tailed) | .312 | .436 | .562 | .322 | .322 | .322 | .322 | .362 | .895 | .005 | .611 | .051 | .701 | .092 | .511 | <.001 | . | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | | |
| | Wind energy potential | Correlation Coefficient | .387 | .350 | .764* | -.068 | .026 | .053 | .520 | .300 | .879** | .522 | .515 | .727 | .608 | .952** | -.237 | .553 | .553 | -- | |
| | | Sig. (2-tailed) | .269 | .321 | .010 | .851 | .947 | .884 | .152 | .470 | .009 | .185 | .296 | .101 | .062 | <.001 | .701 | .334 | .334 | . | |
| | | N | 10 | 10 | 10 | 10 | 9 | 10 | 9 | 8 | 7 | 8 | 6 | 6 | 10 | 9 | 5 | 5 | 5 | 11 | |
| | Economic viability of project | Correlation Coefficient | .323 | .566 | .498 | .127 | .000 | -.088 | -.160 | -.185 | .481 | -.089 | .397 | .238 | .260 | .571 | -.811 | -.162 | -.162 | .699* | -- |
| | | Sig. (2-tailed) | .362 | .088 | .143 | .727 | 1.000 | .809 | .681 | .661 | .274 | .835 | .435 | .649 | .468 | .108 | .096 | .794 | .794 | .017 | . |
| | | N | 10 | 10 | 10 | 10 | 9 | 10 | 9 | 8 | 7 | 8 | 6 | 6 | 10 | 9 | 5 | 5 | 5 | 11 | 11 |

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

# *Appendix D: Spearman's Correlation: Factors that Impact Permit Denial*

**Correlation Table: Factors that impact permit denial**

| | | | Community engagement in consultation process | Community support for wind energy | Community support for the specific transmission line project | Lobbying/special interest opposition to wind energy | Lobbying/special interest opposition to the specific transmission line project | Provincial government support of the project | Federal government support of the project | Ease of siting process | Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | Ease of permitting process | Centralized permitting process | Decentralized permitting process | Provincial policies supporting renewable energy projects | Federal policies supporting renewable energy projects | Majority Conservative Party representation | Majority Liberal Party representation | Majority New Democratic Party (NDP) representation | Wind energy potential | Economic viability of project |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spearman's rho | Community engagement in consultation process | Correlation Coefficient | -- | | | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | . | | | | | | | | | | | | | | | | | | |
| | | N | 5 | | | | | | | | | | | | | | | | | | |
| | Community support for wind energy | Correlation Coefficient | .892* | -- | | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .042 | . | | | | | | | | | | | | | | | | | |
| | | N | 5 | 5 | | | | | | | | | | | | | | | | | |
| | Community support for the specific transmission line project | Correlation Coefficient | .973** | .917* | -- | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .005 | .029 | . | | | | | | | | | | | | | | | | |
| | | N | 5 | 5 | 5 | | | | | | | | | | | | | | | | |
| | Lobbying/special interest opposition to wind energy | Correlation Coefficient | .359 | .316 | .264 | -- | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .553 | .604 | .668 | . | | | | | | | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | | | | | | | | | | | | | | | |
| | Lobbying/special interest opposition to the specific transmission line project | Correlation Coefficient | .368 | .406 | .270 | .975** | -- | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .542 | .498 | .660 | .005 | . | | | | | | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | | | | |
| | Provincial government support of the project | Correlation Coefficient | .947* | .973** | .973** | .205 | .263 | -- | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .014 | .005 | .005 | .741 | .669 | . | | | | | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | | | |
| | Federal government support of the project | Correlation Coefficient | .287 | .530 | .295 | .783 | .860 | .344 | -- | | | | | | | | | | | | |
| | | Sig. (2-tailed) | .640 | .358 | .630 | .118 | .061 | .571 | . | | | | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | | |
| | Ease of siting process | Correlation Coefficient | .631 | .884* | .648 | .112 | .287 | .803 | .500 | -- | | | | | | | | | | | |
| | | Sig. (2-tailed) | .254 | .047 | .237 | .858 | .640 | .102 | .391 | . | | | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | |
| | Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | Correlation Coefficient | .287 | .530 | .295 | .783 | .860 | .344 | 1.000** | .500 | -- | | | | | | | | | | |
| | | Sig. (2-tailed) | .640 | .358 | .630 | .118 | .061 | .571 | <.001 | .391 | . | | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | |
| | Ease of permitting process | Correlation Coefficient | .789 | .973** | .811 | .410 | .526 | .895* | .688 | .918* | .688 | -- | | | | | | | | | |
| | | Sig. (2-tailed) | .112 | .005 | .096 | .493 | .362 | .040 | .199 | .028 | .199 | . | | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | |
| | Centralized permitting process | Correlation Coefficient | .730 | .917* | .750 | .580 | .676 | .811 | .825 | .825 | .825 | .973** | -- | | | | | | | | |
| | | Sig. (2-tailed) | .161 | .029 | .144 | .306 | .210 | .096 | .086 | .086 | .086 | .005 | . | | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | |
| | Decentralized permitting process | Correlation Coefficient | .730 | .917* | .750 | .580 | .676 | .811 | .825 | .825 | .825 | .973** | 1.000** | -- | | | | | | | |
| | | Sig. (2-tailed) | .161 | .029 | .144 | .306 | .210 | .096 | .086 | .086 | .086 | .005 | <.001 | . | | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | |
| | Provincial policies supporting renewable energy projects | Correlation Coefficient | .632 | .811 | .649 | .718 | .789 | .684 | .918* | .688 | .918* | .895* | .973** | .973** | -- | | | | | | |
| | | Sig. (2-tailed) | .253 | .096 | .236 | .172 | .112 | .203 | .028 | .199 | .028 | .040 | .005 | .005 | . | | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | |
| | Federal policies supporting renewable energy projects | Correlation Coefficient | .287 | .530 | .295 | .783 | .860 | .344 | 1.000** | .500 | 1.000** | .688 | .825 | .825 | .918* | -- | | | | | |
| | | Sig. (2-tailed) | .640 | .358 | .630 | .118 | .061 | .571 | <.001 | .391 | <.001 | .199 | .086 | .086 | .028 | . | | | | | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | |
| | Majority Conservative Party representation | Correlation Coefficient | .000 | .389 | .000 | .738 | .889 | .105 | 1.000** | .500 | 1.000** | .632 | .833 | .833 | .949 | 1.000** | -- | | | | |
| | | Sig. (2-tailed) | 1.000 | .611 | 1.000 | .262 | .111 | .895 | <.001 | .500 | <.001 | .368 | .167 | .167 | .051 | <.001 | . | | | | |
| | | N | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | |
| | Majority Liberal Party representation | Correlation Coefficient | .000 | .389 | .000 | .738 | .889 | .105 | 1.000** | .500 | 1.000** | .632 | .833 | .833 | .949 | 1.000** | 1.000** | -- | | | |
| | | Sig. (2-tailed) | 1.000 | .611 | 1.000 | .262 | .111 | .895 | <.001 | .500 | <.001 | .368 | .167 | .167 | .051 | <.001 | <.001 | . | | | |
| | | N | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| | Majority New Democratic Party (NDP) representation | Correlation Coefficient | .000 | .389 | .000 | .738 | .889 | .105 | 1.000** | .500 | 1.000** | .632 | .833 | .833 | .949 | 1.000** | 1.000** | 1.000** | -- | | |
| | | Sig. (2-tailed) | 1.000 | .611 | 1.000 | .262 | .111 | .895 | <.001 | .500 | <.001 | .368 | .167 | .167 | .051 | <.001 | <.001 | <.001 | . | | |
| | | N | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | |
| | Wind energy potential | Correlation Coefficient | .287 | .530 | .295 | .783 | .860 | .344 | 1.000** | .500 | 1.000** | .688 | .825 | .825 | .918* | 1.000** | 1.000** | 1.000** | 1.000** | -- | |
| | | Sig. (2-tailed) | .640 | .358 | .630 | .118 | .061 | .571 | <.001 | .391 | <.001 | .199 | .086 | .086 | .028 | <.001 | <.001 | <.001 | <.001 | . | |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | |
| | Economic viability of project | Correlation Coefficient | .730 | .917* | .750 | .580 | .676 | .811 | .825 | .825 | .825 | .973** | 1.000** | 1.000** | .973** | .825 | .833 | .833 | .833 | .825 | -- |
| | | Sig. (2-tailed) | .161 | .029 | .144 | .306 | .210 | .096 | .086 | .086 | .086 | .005 | <.001 | <.001 | .005 | .086 | .167 | .167 | .167 | .086 | . |
| | | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 |

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

# *Appendix E: Spearman's Correlation: Factors that Impact Permit Withdrawal*

**Correlation Table: Factors that impact permit withdrawal**

| | | | Community engagement in consultation process | Community support for wind energy | Community support for the specific transmission line project | Lobbying/special interest opposition to wind energy | Lobbying/special interest opposition to the specific transmission line project | Provincial government support of the project | Federal government support of the project | Ease of siting process | Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | Ease of permitting process | Centralized permitting process | Decentralized permitting process | Provincial policies supporting renewable energy projects | Federal policies supporting renewable energy projects | Majority Conservative Party representation | Majority Liberal Party representation | Majority New Democratic Party (NDP) representation | Wind energy potential | Economic viability of project |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spearman's rho | Community engagement in consultation process | Correlation Coefficient | -- | | | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | . | | | | | | | | | | | | | | | | | | |
| | | N | 3 | | | | | | | | | | | | | | | | | | |
| | Community support for wind energy | Correlation Coefficient | 1.000** | -- | | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | <.001 | . | | | | | | | | | | | | | | | | | |
| | | N | 3 | 3 | | | | | | | | | | | | | | | | | |
| | Community support for the specific transmission line project | Correlation Coefficient | 1.000** | 1.000** | -- | | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | <.001 | <.001 | . | | | | | | | | | | | | | | | | |
| | | N | 3 | 3 | 3 | | | | | | | | | | | | | | | | |
| | Lobbying/special interest opposition to wind energy | Correlation Coefficient | 1.000** | 1.000** | 1.000** | -- | | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | <.001 | <.001 | <.001 | . | | | | | | | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | | |
| | Lobbying/special interest opposition to the specific transmission line project | Correlation Coefficient | 1.000** | 1.000** | 1.000** | 1.000** | -- | | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | <.001 | <.001 | <.001 | <.001 | . | | | | | | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | |
| | Provincial government support of the project | Correlation Coefficient | . | . | . | . | . | . | | | | | | | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | | | | | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | |
| | Federal government support of the project | Correlation Coefficient | . | . | . | . | . | . | . | | | | | | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | | | | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| | Ease of siting process | Correlation Coefficient | . | . | . | . | . | . | . | . | | | | | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | | | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | |
| | Governmental use of expropriation or eminent domain to obtain land necessary for the transmission line sitting | Correlation Coefficient | . | . | . | . | . | . | . | . | . | | | | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | |
| | Ease of permitting process | Correlation Coefficient | . | . | . | . | . | . | . | . | . | -- | | | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | . | | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | | | | | | | | | |
| | Centralized permitting process | Correlation Coefficient | . | . | . | . | . | . | . | . | . | 1.000** | -- | | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | <.001 | . | | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | | | | | | | | |
| | Decentralized permitting process | Correlation Coefficient | . | . | . | . | . | . | . | . | . | 1.000** | 1.000** | -- | | | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | <.001 | <.001 | . | | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | | | | | | | |
| | Provincial policies supporting renewable energy projects | Correlation Coefficient | 1.000** | 1.000** | 1.000** | 1.000** | 1.000** | . | . | . | . | .966** | .966** | .966** | -- | | | | | | |
| | | Sig. (2-tailed) | <.001 | <.001 | <.001 | <.001 | <.001 | . | . | . | . | <.001 | <.001 | <.001 | . | | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | | | | | | |
| | Federal policies supporting renewable energy projects | Correlation Coefficient | . | . | . | . | . | . | . | . | . | 1.000** | 1.000** | 1.000** | .966** | -- | | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | <.001 | <.001 | <.001 | <.001 | . | | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | | | | | |
| | Majority Conservative Party representation | Correlation Coefficient | . | . | . | . | . | . | . | . | . | 1.000** | 1.000** | 1.000** | .966** | 1.000** | -- | | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | <.001 | <.001 | <.001 | <.001 | <.001 | . | | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | | | | |
| | Majority Liberal Party representation | Correlation Coefficient | . | . | . | . | . | . | . | . | . | 1.000** | 1.000** | 1.000** | .966** | 1.000** | 1.000** | -- | | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | . | | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | |
| | Majority New Democratic Party (NDP) representation | Correlation Coefficient | . | . | . | . | . | . | . | . | . | 1.000** | 1.000** | 1.000** | .966** | 1.000** | 1.000** | 1.000** | -- | | |
| | | Sig. (2-tailed) | . | . | . | . | . | . | . | . | . | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | . | | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | Wind energy potential | Correlation Coefficient | 1.000** | 1.000** | 1.000** | 1.000** | 1.000** | . | . | . | . | .966** | .966** | .966** | 1.000** | .966** | .966** | .966** | .966** | -- | |
| | | Sig. (2-tailed) | <.001 | <.001 | <.001 | <.001 | <.001 | . | . | . | . | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | . | |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | Economic viability of project | Correlation Coefficient | 1.000** | 1.000** | 1.000** | 1.000** | 1.000** | . | . | . | . | .907** | .907** | .907** | .939** | .907** | .907** | .907** | .907** | .939** | -- |
| | | Sig. (2-tailed) | <.001 | <.001 | <.001 | <.001 | <.001 | . | . | . | . | .005 | .005 | .005 | .002 | .005 | .005 | .005 | .005 | .002 | . |
| | | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

**. Correlation is significant at the 0.01 level (2-tailed).

*Appendix F. Summary of CER International Power Line Filing Requirements.*

Summary of International Power Line Filing Requirements

| Electricity Filing Manual Chapter | Main Information Requirements |
| --- | --- |
| 3. Common Information Requirements<br>3.1 Action Sought by Applicant<br>3.2 Project Applicants<br>3.3 Proof of Publication of Notice | A description of what CER authorization is being applied for<br>Identity of applicant and contact information<br>Identity of the owners and operators of the IPL in Canada, if different from the applicant<br>A description of the owner and operator of the power systems<br>Identity of the owners and operators of the power line outside Canada<br>A proof of publication of notice |
| 4. Project Description and Engineering | Provide a description of the IPL project that includes its location, all project components and activities, the project schedule and any related undertakings |
| 4.1 Project Location | Locational information should include a description, and maps, of:<br>The route, facility sites and any proposed ancillary facilities<br>The terminal points and international boundary crossover point<br>Environmental, socio-economic, and land or resource use constraints that restrict the preferred route or location of facilities<br>Land use features which the IPL is to cross<br>The power line outside Canada |

| | |
|---|---|
| 4.2 Project Components and Activities | The description of project components and activities should include:<br>Voltage level<br>Number and size of conductors<br>Description of the tower or other structures that will provide the physical support<br>A single-line diagram identifying all the IPL facilities<br>Discussion of engineering philosophy and principles<br>A description of standards, practices and procedures to be used in the design, construction and operation of the IPL |
| 4.3 Impacts to the Bulk Power system | Impacts to the bulk power system<br>A description of the power transfer capability and the criteria for this<br>A copy of all interconnection agreements or other agreements<br>A description of provincial requirements and any other approvals required, including those for the power line outside Canada |
| 4.4 Other Required Approvals and Project Schedule | A schedule showing the proposed dates for the start and completion of construction of the IPL and the power line outside Canada<br>A description of the other approvals required, the review process and schedule applicable, and their current status |
| 4.5. Alternatives | A description of the environmental, land-use and other criteria used to determine the proposed route and facility sites, and any alternatives<br>A map of the alternative route and facility sites |
| 5. Engagement | A description of any engagement or early public notification process implemented by the applicant, which should include:<br>The principles and goals of the engagement program<br>The design of the engagement program<br>The results of the engagement<br>An explanation if an engagement program was not implemented |

| | |
|---|---|
| | Notification of third parties<br>Description of any adverse effects on other provinces |
| 6. Environmental and Socio-economic Assessment | An impact assessment, completed according to the applicable federal or provincial legislation, for the construction and operation of the proposed project<br>This should be based on the project description, provide a description of the environmental setting, elucidate any project-environment interactions and identify potential project-related environmental effects, describe the mitigative measures to be used, and evaluate the environmental and cumulative effects arising from the IPL |
| 7. Economics | A copy of the most recent annual report of the owner and operator of the lines both in Canada and outside of Canada<br>And alternatively, for the line in Canada, information for the Commission to determine:<br>Evidence that the proposed IPL will be used, useful and and contribute to the Canadian public interest<br>Description of supply, demand, load conditions<br>Evidence of the ability to finance the IPL |
| 8. Lands Information | Documentation on land areas and land rights<br>For election certificates, service of notice, land acquisition process<br>A plan or survey for the international boundary crossover point |