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Wind Energy Development in Ontario: Factors Influencing Deployment and Policy Outcomes

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WIND ENERGY DEVELOPMENT IN ONTARIO: FACTORS INFLUENCING DEPLOYMENT AND POLICY OUTCOMES

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by

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Abstract

The goal of this thesis is to gain an understanding of the factors promoting and hindering wind energy development (henceforth WED) from the perspective of communities and developers in Ontario. Ontario arguably has one of the most ambitious policies for WED in the world, centered on the Green Energy and Green Economy act, 2009 (henceforth GEA). Despite progressing to become Canada's leading province in installed wind energy capacity, various conflicts and roadblocks to deployment remain evident.

In response to gaps identified in literature seeking to understand the factors that impact the (un)successful deployment of wind power, the current thesis provides multiple methodological roadmaps for gaining a more holistic understanding of WED through media analysis. Specific to the Ontario context, the thesis aims to understand the factors that promote or hinder community support for WED. As well, the goal is to understand the factors promoting or hindering the activities of wind energy developers within the province. The aforementioned objectives are addressed through media content analysis and semi-structured interviews respectively.

While results from the media analysis suggests that social acceptance is most strongly impacted by health and economic factors, developer interviews suggest that the elimination of local planning for WED has created major disconnects between developers and host communities. This disconnect has consequently compromised the deployment of the technology.

The study makes methodological, theoretical and policy contributions to existing literature on WED. Methodologically, the study demonstrates the efficacy of media content analysis for understanding the temporal evolution of social responses to WED and developing interview instruments. The study also provides an original methodological protocol for the utilization of media analysis to understand WED. Theoretically, the study demonstrates the utility of holistic approaches for teasing out the most salient determinants of WED and policy outcomes. Finally, the study highlights the importance of community engagement in the WED process. As well, it demonstrates the need for detailed policies to guide developers and communities in their engagement with each other.

Key words: wind energy, Ontario, media, interviews, content analysis, newspapers

CO-AUTHORSHIP STATEMENT

This dissertation is made up of a collection of papers which are being prepared for publication. The study context, problem, objectives and the relationship among the various manuscripts are outlined in the introductory chapter. The final chapter provides a summary and conclusions. The research manuscripts are as follows:

1. A Methodological Roadmap for Content Analysis of Wind Energy Development and Policy

2. Wind Energy Development in Ontario: Key Discourses Impacting Social Acceptance

3. Wind Energy Development in Ontario: Understanding Developer Perspectives and Experiences

While all the papers being prepared for publication will be co-authored with my thesis supervisor(s) and other advisory committee members, as the first author, I conducted all of the research including problem identification, literature review, data collection, data analysis, and writing. The bibliographies of the individual chapters are consistent with the University of Western Ontario Graduate and Postdoctoral Thesis requirements.

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CHAPTER 1

1. Introduction

This dissertation examines multiple aspects of wind energy development (henceforth, WED) that together shape deployment and policy outcomes within the province of Ontario. It also provides methodological approaches for researchers seeking to gain a holistic understanding of WED through media analysis. As an introduction to this thesis, this chapter provides an overview of wind energy development and policies in Ontario. This overview helps to frame the results chapters of the dissertation that are presented as related but independent research articles. As such, this is an 'integrated articles' dissertation that requires an introductory chapter to situate the research results as presented in the independent articles. The literature review presented in this introduction is a review of relevant literature common to all three results chapters (i.e. articles). The chapter concludes by detailing the organization of the thesis and emphasizing the interconnectedness of its major components.

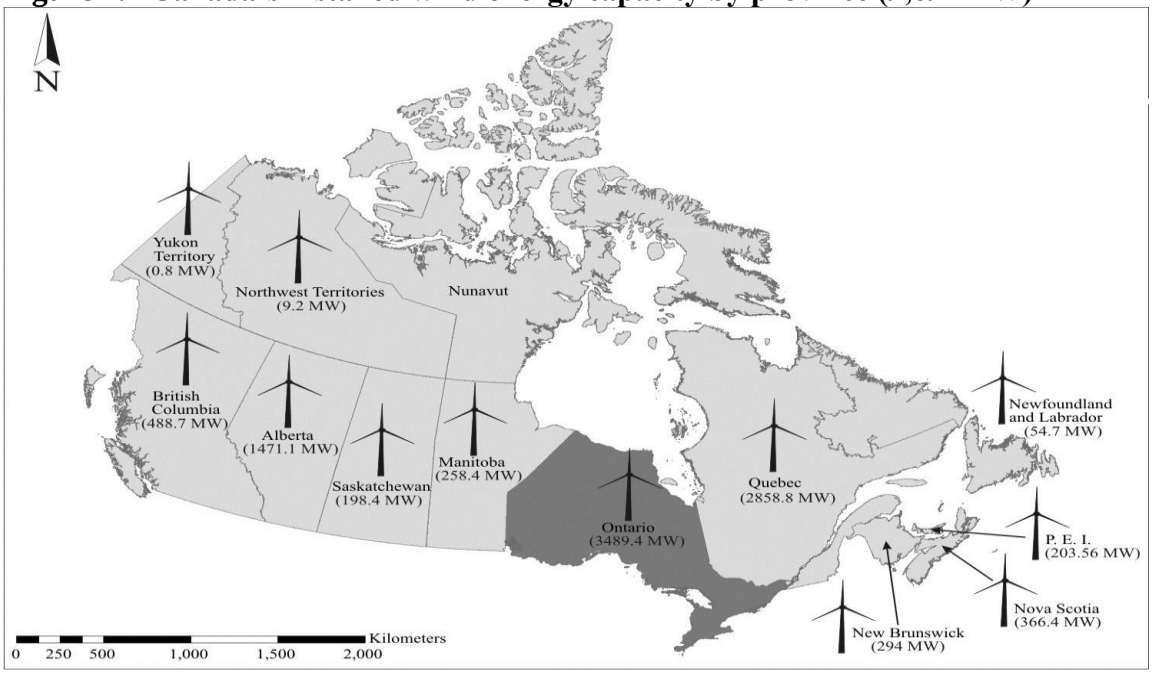
1.1 Research Background

Renewable energy technologies are receiving considerable attention worldwide based on their perceived ability to address energy security concerns, minimize negative health and environmental impacts from energy generation, and provide diverse economic benefits (REN 21, 2014). Amidst a broad range of renewable energy technologies, wind energy is currently experiencing the fastest growth rate in the world (Bilgili *et al*, 2015; Hu *et al*, 2015). This may be explained by the cost effectiveness of the technology and its

ability to be quickly developed (Volkwein *et al*, 2015; Makridis, 2013). Canada in particular is endowed with a world-class natural resource base suitable for wind energy generation (Canadian Wind Energy Association, 2015a; Natural Resource Canada, 2014). All Canadian provinces have made some strides towards deploying wind power.

With an estimated installed capacity of approximately 3,489.4MW, Ontario is Canada's current leader in wind energy generation (Canadian Wind Energy Association, 2015a). This represents about a third of Canada's total installed wind energy capacity (see Figure 1.1). A major driver of WED within the province has been the Green Energy and Green Economy Act (henceforth, GEA) that was enacted in 2009 to promote renewable energy development and create green jobs (Ontario Ministry of Energy, 2015). According to Ontario's Ministry of Environment (2010), the policy resulted in drastic increases in the number of wind turbines within Ontario from 10 in 2003 to approximately 1100+ currently installed and twice that number planned to 2030.

Figure 1.1 Canada's installed wind energy capacity by province (9,694MW)



Generation capacities obtained from the Canadian Wind Energy Association (2015)

Within Ontario, there is significant debate and community mobilizing against the development of wind power. There has also been massive growth in the number of citizen groups contesting the development of wind energy. Wind Concerns Ontario, which is made up of over 40 registered local citizen groups within the province, is arguably the most powerful organization battling the deployment of the technology (Wind Concerns Ontario, 2015). Over 90 municipalities in Ontario have also been reported to declare themselves unwilling to host wind energy projects (Wind Concerns Ontario, 2015). Yet amidst strong opposition, some Ontarians are in favour of the technology. According to a 2010 poll conducted by Ipsos, a global independent market research company in Canada, 89% of Ontarians support wind energy (Ipsos Reid, 2010). The presence of strong policies and government support for wind energy development, as well as the juxtaposition of public support and conflict, makes Ontario a good study region for theoretical, conceptual and empirical analysis.

This thesis aims to contribute to our understanding of WED in three main ways. First, the thesis presents a methodological roadmap for utilizing media content analysis to understand public perceptions of WED and tease out stakeholder conflicts that arise in the deployment of wind power. The research presented here builds on prior published research in which the potentials of media discourse content analysis were harnessed. The second component of the thesis utilizes a longitudinal eight-year media content analysis of newspapers circulated within communities hosting wind turbines in Ontario to understand the nature of public perceptions surrounding the technology. The third and final component of this thesis involves interviews with wind energy developers across Ontario to understand major roadblocks confronting them as well as areas in which they have achieved success.

1.2 Wind energy development in Ontario: Overview of policy and historical context

Historically, Ontario's first wind turbine was installed in 1994 with the aim of testing turbine performance during the winter season (Rosano, 2009). The wind turbine was installed near Tiverton, Ontario which subsequently became home to Ontario's first commercial wind farm (Huron wind) in 2002 (Huron Wind, 2015). Seven years later, in a watershed moment for wind energy development in Ontario and indeed Canada, the province introduced the Green Energy and Green Economy Act (2009) (henceforth, GEA). The aim of the Act was to "expand renewable energy generation, encourage energy conservation and promote the creation of clean energy jobs" (Ontario Ministry of Energy, 2015; see also Independent Electricity System Operator, 2015).

To varying degrees, the GEA amended approximately 16 Acts, which included legislations around energy consumption and supply (e.g., the Energy Efficiency Act), policies on environmental protection (e.g., Environmental Protection Act), various economic oriented policies (e.g., Co-operative corporations Act), policies around the construction of buildings and other structures (e.g., Building Code Act) and a host of other legislations. A major motivation for these policy amendments under the GEA was to eliminate any bureaucratic 'red tape' that could hinder the rapid deployment of wind power (The Canadian Press, 2009; Saxe, 2009). The GEA also removed municipal authority over the approval, planning and location of wind energy projects (Hill & Knott, 2010; Deignan & Hoffman-Goetz, 2015).

Another significant aspect of the GEA involved the introduction of Feed-in-Tariffs (FIT's), which were the first of their kind in a North America jurisdiction (Independent Electricity System Operator, 2009a). The FIT program created an attractive market for renewable energy development by offering renewable energy developers fixed prices for energy generated over a 20year period. Under the original FIT program, wind energy was offered at a fixed price of 13.5cents/kWh (Independent Electricity System Operator, 2009b).

The GEA and its accompanying FIT program have resulted in the unprecedented growth of renewable energy in Ontario. In addition to being Canada's current leader in wind energy generation, Ontario became the first North American jurisdiction to eliminate energy generation from coal (Canadian Wind Energy Association, 2015b). In 2013, the province of Ontario made significant changes to the FIT program (Brands,

2013). The most significant of these changes included the introduction of a competitive process for the procurement of renewable energy projects above 500kW and the requirements that developers demonstrate quality engagement with municipalities and communities prior to securing projects (Ontario Ministry of Energy, 2013).

Ontario remains committed to the development of renewable energy. Under the provinces Long Term Energy Plan (Ontario Long Term Energy Plan, 2013), a target of 300MW of new wind power is expected in 2014 and 2015.

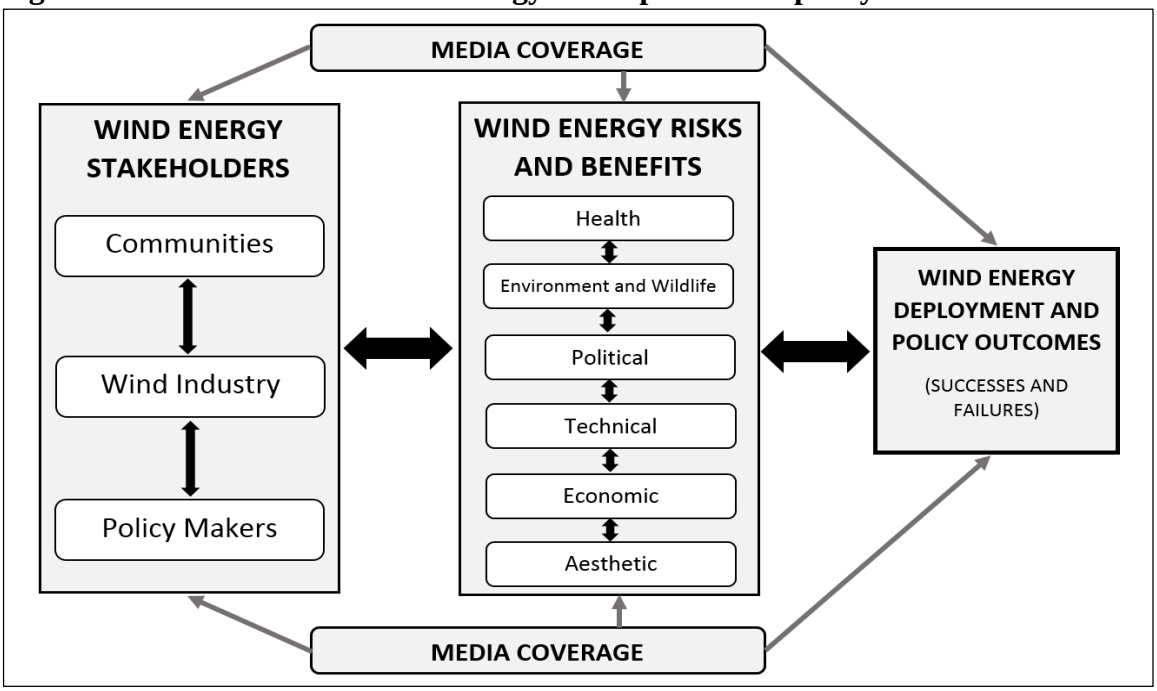
1.3 A framework for understanding wind energy deployment and policy outcomes

This section presents a broad framework for gaining an extensive understanding of WED and policy outcomes. This is followed by a review of literature on different components of the framework and the location of the current thesis within the existing literature. Gaining a comprehensive understanding of wind energy deployment and policy outcomes requires an in-depth understanding of various wind energy stakeholders, their respective values pertaining to the technology and its impacts, and their interactions (i.e., conflicts and agreements). Additionally, gaining an understanding of externalities such as media coverage is key to analysing deployment and policy outcomes, since the media frames the aforementioned factors and impacts stakeholder perspectives.

Figure 1.2 provides a structure for holistically understanding WED and policy outcomes. It is developed from the relevant sets of academic literature in the field, as discussed below, and identifies the stakeholders who interact to determine the success of developments. These include policy makers who establish principles, requirements and

protocols for deployment, developers who are responsible for the actual development and maintenance of wind farms and communities (e.g., resistance and/or support groups and residents) who host developments.

Figure 1.2 Determinants of wind energy development and policy outcomes



Stephens *et al* (2009) captured six major factors central to discourses on wind power. These factors have been at the core of most studies on WED and include health, aesthetics, environment & wildlife, politics, economics and technical factors. As shown in Figure 1.2, each stakeholder is likely to have a set of values pertaining to the aforementioned factors (i.e., the categories of risks and benefits associated with WED). A divergence of stakeholder values is likely to trigger conflicts around developments. In this light, Ellis *et al* (2007, p.521) contend that "it appears that key issues facing wind farm development are not 'objective' policy blockages, but clashes of values related to

inter alia, governance, technology…, precisely those that defy rational quantifiable explanation" (see also McClymont & O'Hare 2008).

Though the media are not a wind energy stakeholder in a direct sense, they possess the ability to shape WED and policy outcomes in more indirect and yet profound ways. This is because the media play a central role in shaping public discourses (Jonsson, 2011; Harrington *et al*, 2012). For example, it has been noted that the media in Germany have reported about local opposition to wind farms (Wustenhagen *et al*, 2007), while the media in Ontario have been found to focus on the economics of WED (Songsore & Buzzelli, 2014).

The next subsections review literature that concerns itself with various components of the framework presented in Figure 1.2. Focus is placed on studies that address the perspectives and responses of wind energy stakeholders (i.e., wind industry, communities and policy makers) to developments as well as the specific risks and benefits of wind power, which have been the focus of these studies.

1.3.1 Community responses to wind energy development

The most significant contribution of social scientific research to our understanding of WED and policy outcomes has arguably been in the area of community responses. This research agenda has generated a range of studies that seek to understand how specific perceived risks and benefits (see Figure 1.2) trigger social acceptance or rejection of various wind power projects. Major issues at the core of these studies include the impact of economics (see. Warren & McFadyen, 2010; Cowell *et al*, 2011; Aitken, 2010; Walker *et al*, 2014), environment and wildlife (see Voigt *et al*, 2015; Ek & Matti, 2014), health

risk perceptions (see Hill and Knott, 2010), aesthetics and place attachment (see Devine-Wright & Howes, 2010; Pasqualetti, 2011; Johansson & Laike, 2007), the planning process (i.e., Nadia, 2007, Gross, 2007) and a host of other factors on the social acceptance of wind energy projects.

Studies on the role of economic factors in determining social responses to WED have generally focused on understanding how community ownership and financial benefits impact acceptance. Though these studies have generated varying outcomes concerning the complexity of ownership and financial benefits, there seems to be a consensus that these incentives foster social acceptance (Delvin, 2005; Warren & McFadyen, 2010; Cowell *et al*, 2011; Bidwell, 2013). Another economic issue in the literature is the idea that perceived property value impacts of wind turbines increase community concerns around projects (see. Hoen *et al*, 2011). However, as has been noted by Walker *et al* (2014), very limited attention has been paid to the nature of perceived property value impacts at the community scale. A few studies have suggested that individuals are unwilling to pay higher electricity prices that result from wind power (Kataprakakis, 2012). While the potential impacts of increased energy prices on social acceptance has not been investigated, anecdotal evidence from websites of some wind energy resistance groups reveals that this is a prominent rationale for resistance (e.g., see Wind Concerns Ontario, 2015).

The role of aesthetics and place attachment in shaping social responses to WED has also received substantial attention. In general, research consistently suggests that perceptions of negative aesthetic impacts trigger resistance to wind power. Taking the

concept of aesthetics further, others have suggested that resistance may be rooted in scenic values placed on landscapes as well place attachment (Pasqualetti, 2001, 2011; Lange and Hehl-Lange, 2005; Devine-Wright & Howes, 2010).

The impact of politics and planning on social acceptance of WED is yet another area that has received a great deal of attention. Within these studies, a lot of emphasis has been placed on the issues of justice (i.e., procedural and distributive), trust and fairness. These studies have generated similar outcomes such as the fact that public participation in the development process promotes social acceptance (Loring, 2007, Devine-Wright, 2005). Similarly, transparency in the development process (Jobert *et al*, 2007), perceptions of procedural and distributive fairness (Haggett, 2008; Huijts *et al*, 2012) as well as community trust in policy makers and developers (Walker *et al*, 2010) have been found to have a direct relationship with social acceptance.

Perceptions of health risks have emerged as a major determinant of social acceptance of WED within some jurisdictions. This may be explained by the controversial nature of wind turbine health effects (Shepherd *et al*, 2011). In Ontario, for instance, Baxter *et al* (2013) have contended that health risk perceptions play an important role in determining support for developments. Similarly others have found health risk perceptions to be a major determinant for turbine support (see. Songsore and Buzzelli, 2014b; Rubin *et al*, 2014).

The role of perceived environment and wildlife impacts on social responses to WED has received little attention in the literature. It could nonetheless be argued that studies on aesthetic impacts cover environmental impacts to some degree. Studies on how

social responses are shaped by perceived impacts of turbines on flora and fauna are also limited. Nonetheless, only a few existing studies show that these are significant determinants of social responses to turbines. For example, Dimitropoulos & Kontoleon (2009; 1843), in a study of local acceptance in the Greek Aegean Islands, indicated that the "conservation status of the area where the wind farms are to be installed…" was one of the most important determinants of social acceptance. Wolsink (2010) also asserted that environmentalists have strong inclinations regarding the suitable and environmentally acceptable siting of turbines. An analysis of objection letters to a proposed wind farm development revealed that ornithology was one of the most frequently mentioned concerns within the project community (Aitken *et al*, 2008). Together the aforementioned studies reveal that perceived negative environment and/or wildlife impacts of wind power may result in rejection of projects by host communities.

The way community perspectives about the efficacy of wind energy technology impact social acceptance has rarely been part of the research agenda within studies on community responses to development. However, Lin (2013) highlighted the importance of increased communication about the scientific aspects of wind power based on poor public knowledge about the technology. While the impact of technical understanding on social acceptance has not been explicitly spelled out in the literature, wind energy resistance groups oppose the technology on technical grounds (see Wind Concerns Ontario, 2015). Hence, it is fair to assume that negative perceptions about the technicalities of wind power could trigger resistance.

Research reveals that social acceptance is a precondition for the successful deployment of renewable energy technologies (Yuan *et al*, 2015). Hence the aforementioned studies have played a crucial role in explaining the relative success of various projects from a community-acceptance perspective. Nonetheless, based on the focus on specific or few determinants of social responses within these individual studies, little is known about how multiple factors and their interplay determine social responses. Additionally, the cross sectional and community orientation of these studies do not allow for an understanding of the evolution of social responses over time, as Wolsink (2007) suggests may happen, nor the nature of social responses across broad spatial scales. Finally, relative to community level studies on social responses to wind power, little attention has been paid to the influence of external forces such as the media in shaping public perceptions and responses.

More recently, studies are beginning to consider the role of multiple factors in shaping social responses to WED (see. Stephens *et al*, 2009; Songsore and Buzzelli, 2014b). Media analysis has been prescribed as an effective approach for assessing "perceptions of risks and benefits of individual emerging energy technologies" (Stephens *et al*, 2008; 1235). This assertion is based by the strong role played by the media in shaping public perceptions and discourses among energy stakeholders.

There have been recent calls for multi-dimensional approaches towards understanding the deployment of wind power (see Richards *et al*, 2012). Based on the relative novelty of WED in Ontario compared to other jurisdictions, the current study utilizes a longitudinal eight-year media content analysis to understand how multiple

factors and their interplay likely shape social responses to WED in Ontario. As well, the thesis presents a methodological roadmap for utilizing variations to media analysis to understand social responses to wind energy development and other renewable energy technologies.

1.3.2 The roles and experiences of wind energy developers and policy makers

As noted in the previous section, social science research in the areas of renewable energy development and WED in particular has primarily focused on community responses to developments. Hence, there is relatively limited but growing research that has been conducted to understand how the role and experiences of other wind energy stakeholders impact deployment. Within these studies, stakeholders who have received attention include local officials within communities hosting developments, wildlife and environmental conservation officials, environmental groups, renewable energy NGOs, technical experts and academics.

A major theme at the center of a majority of these studies is the impact of economic factors on the success of WED specifically from the perspective of developers and the broader private energy sector (see. Alberts, 2007; Friebe *et al*, 2014; Lam *et al*, 2013). Collectively these studies have revealed that favorable economic conditions strongly encourage developers and the private energy sector to invest in wind power. Feed In Tariffs (FITs) have continually emerged as the most effective form of financial incentive that encourages the deployment of wind power (Friebe *et al*, 2014). Since FITs provide fixed and guaranteed prices for wind power, they tend to be perceived by developers as a financial risk reduction tool (Lam *et al*, 2013). Conversely, high costs

tends to discourage investments in wind power (O'keeffe & Haggett, 2012; Friebe *et al*, 2014).

Another theme that has received substantial attention within these limited studies is the impact of technical factors on the deployment of wind power. Within these studies, the insufficiency of grid infrastructure, grid integration problems and perceived problems with wind power (e.g., intermittency) have emerged as major roadblocks to wind energy investments (O'keeffe & Haggett, 2012, Richards *et al*, 2012).

Studies have also been conducted on how various political factors determine the success of developers. While these studies have provided varying outcomes, their key findings suggest that developers are motivated by policy environments that eliminate potential impediments to deployment and investments within the wind power sector (Friebe *et al*, 2014), the inclusion of environmental interest groups in the planning process (McCauley, 2015), emphasis on local issues during the planning process (Wolsink & Breukers, 2010) and the inclusion of perspectives from the private sector in the early stages of policy making (Friebe *et al*, 2014). In contrast to seeking consensus among stakeholders, Alberts (2007) has suggested that it may be more valuable to focus on the perspectives of technical experts. This suggestion resulted from the limited capacity of some stakeholders to provide meaningful input on the development process based on their limited experiences in the wind power sector (see Alberts, 2007).

Within the limited research that looks at the experiences and perceptions of wind energy developers, little is known about the way developers interact with communities. One of these examples is from Burningham *et al* (2015) who set out to understand the

prevalence of NIMBY discourses in the way developers conceptualize opponents. Their study found that developers undermined the legitimacy of public concerns based on the perception that public knowledge was deficient.

Fischlein *et al* (2010) sought to understand how multiple issues (health, environment, aesthetics, politics, economics and technical) impact wind energy stakeholders (i.e., academics, government officials, wind industry and environmental NGOs) (Fischlein *et al*, 2010). Comparing deployment across four US states, the study concluded that economic, technical and political issues dominated stakeholder discourses and explained diverse mechanisms through which each of the states reached their deployment levels.

This doctoral research will contribute to growing literature on the perspectives and experiences of developers by providing insights on the broad range of issues that contribute to the success or failure of developers in Ontario. Additionally, this study will provide insights on the mechanisms through which developers interact with and respond to the concerns of their host communities. Though some of the aforementioned studies have examined the perspectives of a broad range of wind energy stakeholders (e.g., Fischlein *et al*, 2010), the perspectives of communities are largely absent within such studies. The current study therefore provides a novel methodological framework that could be used to tease out conflicts among wind energy stakeholders (including communities). This is important because renewable and nonpolluting energy technologies will require effective stakeholder engagement in policy development and the actual deployment of wind power (Adams *et al*, 2011).

1.4 Organization of thesis

With the inclusion of the introductory chapter, this thesis is made up of five chapters. The current chapter (Chapter 1) introduces the thesis by providing a brief overview of the policy and historical context of WED in the study region- Ontario, Canada. This is followed by an overview of the social science literature on community responses to WED as well as literature that addresses the experiences and perspectives of other wind energy stakeholders (e.g., developers, environmental organizations, policy makers, etc.). The literature review is used to locate various components of the thesis within the broader literature on WED, provide rationale for various themes that will be addressed within the thesis and identify ways in which the thesis fills important gaps in literature.

The next three chapters (Chapters 2, 3 and 4) present three separate but interconnected manuscripts which address different research questions (see Figure 1.3 for the summary of the components of these chapters). The overarching questions that all these chapters seek to answer is: What accounts for wind energy deployment development and policy outcomes in Ontario? As well, the thesis will seek to provide methodological approaches for utilizing media analysis to better understand the deployment and policy outcomes of wind power within various jurisdictions.

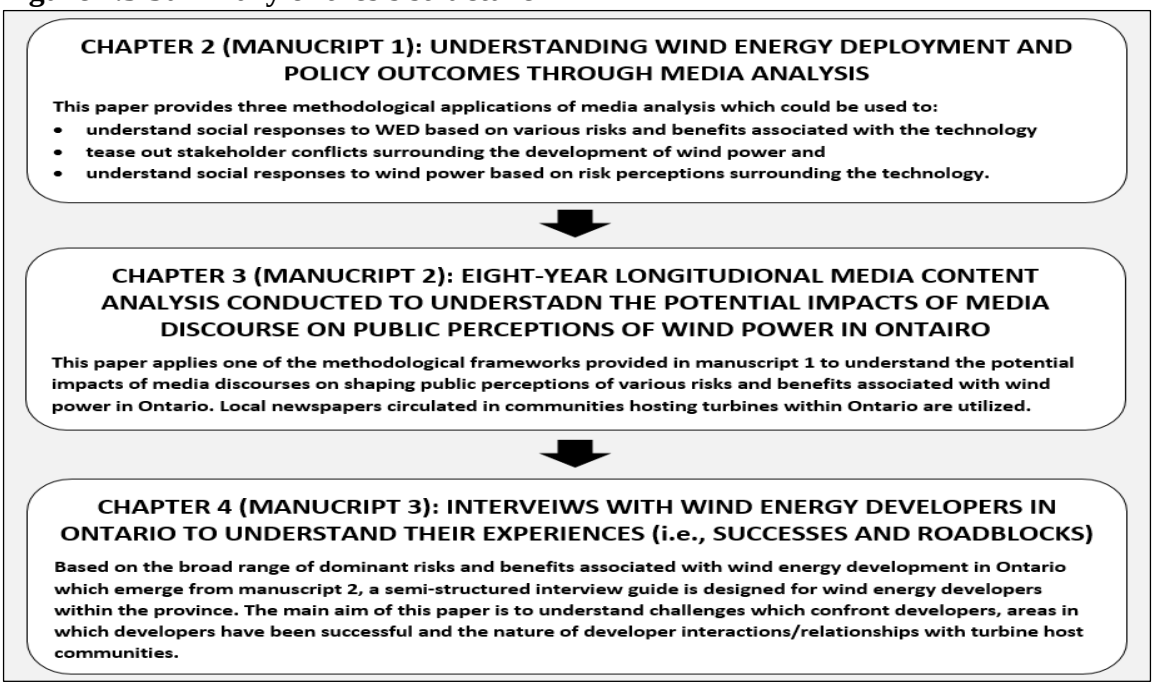
The first manuscript (Chapter 2) provides avenues for the utilization of media analysis to understand WED and policy outcomes from the perspective of communities and/or multiple stakeholder conflicts. Since there is a dearth of research on the role of multiple factors in shaping community responses to developments, the manuscript

presents methodological roadmaps for addressing that gap. The manuscript also provides a methodological roadmap for utilizing media analysis to understand ways in which WED is impacted by stakeholder conflicts and/or consensus.

The second manuscript (Chapter 3) applies one of the analytical roadmaps provided in Chapter 2 to understand the potential impacts of media coverage on public perceptions of various risks and benefits associated with wind power in Ontario. The study utilizes 13 local newspapers circulated within communities hosting development in Ontario.

The analysis is centered on Ontario's Green Energy and Green Economy Act, 2009. Since the Act was a major landmark event that impacted renewable energy development in Ontario, the analysis compares media coverage over an eight year period, specifically in the four years before and after the policy was passed into law.

Figure 1.3 Summary of thesis structure



The third manuscript (Chapter 4) draws on key themes which emerged within the media analysis (Manuscript 2 in Chapter 3) to design a semi-structured interview instrument for wind energy developers in Ontario. The interview questionnaire is framed around the key recurrent and most contentious themes which emerged within the media analysis. The main goals of the developer interviews are to understand various challenges and successes they have encountered in Ontario. As well, this manuscript probes the nature of developer relationships with their host communities pre- and post-development.

The final chapter (Chapter 5) weaves key emerging themes within all the aforementioned chapters together to provide a summary of the study findings, and contributions as well as opportunities for future research.

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CHAPTER 2

A Methodological Roadmap for Content Analysis of Wind Energy Development and Policy

2. Abstract

This paper provides methodological roadmaps for utilizing content analysis to understand wind energy deployment (WED) and policy outcomes. Building on existing literature as well as past and ongoing research, we provide methodological roadmaps for employing three variations of content analysis (CA) to understand stakeholder conflicts surrounding WED as well as public perceptions of and responses to the technology across space and over time. While some of these applications of the methodology have previously been undertaken, it is often challenging to systematically trace the nuances of the methodological protocols utilized. Additionally, the versatile and potentially daunting nature of the CA methodology and its core requirements of validity, replicability and reliability necessitate detailed methodological guidelines for researchers working in specific contexts (e.g., WED). The methods presented in this paper could help fill important gaps in existing literature on WED. They could also be employed in the context of other renewable energy technologies or applied to diverse data sources such as interviews, policy documents and letters of appeal.

2.1 Introduction and Theory

Climate change and energy insecurity have sparked growing global interest in sustainable energy development. Among several alternatives, wind power is a favoured choice of many jurisdictions (Saidur *et al*, 2010; United Nations, 2011) and the fastest growing subsector (Lund, 2014; Masters, 2013). But wind energy development, WED, is also marked by significant community-level turbulence around the development process and outcomes. Research on WED policy and public discourses is growing equally rapidly but is beset by a number of gaps and shortcomings: theoretical, methodological and spatio-temporal. Accordingly, this paper provides a methodological roadmap for documenting and interpreting the content of discourses in WED. The goal is to guide researchers interested in understanding how policy and stakeholders interact in the rapidly growing sector of WED.

Given the rate at which many jurisdictions have engaged WED and, perhaps inevitably, the resulting community tensions, a number of social scientists have examined social responses to development. We outline the highlights of this work here to illustrate the important inroads available to us but also where we see emerging gaps that need redressing. For example, through survey and interview based approaches, some studies seek to understand how finance/economics (Cowell *et al*, 2011; Munday *et al*, 2011), health (Krogh *et al*, 2011; Crichton *et al*, 2014; Rubin, Burns & Wessely, 2014), politics and planning (McLaren, 2007; Lange & Hehl-Lange, 2005; Gross, 2007) and aesthetics and landscape concerns (Molnarova *et al*, 2012; Ladenburg, 2009; Pasqualetti, 2000; 2011) impact social acceptance. While important in their own right, we wonder what

might be the interplay of such factors in conditioning policy success or community resistance. In addition, stakeholder perspectives and conflicts have received little attention (e.g., Fischlein *et al*, 2010) despite acknowledgements of their importance within existing literature (Ellis *et al*, 2007; McClymont & O'Hare, 2008). What is also characteristic of this literature is the confined scope of individual studies: often cases of individual communities at a single point in time (e.g., Warren and McFadyen, 2010; Swofford and Slattery, 2010; Bidwell, 2013). While these community studies are important, it is not always easy to layer them for a more general perspective or interpretation.

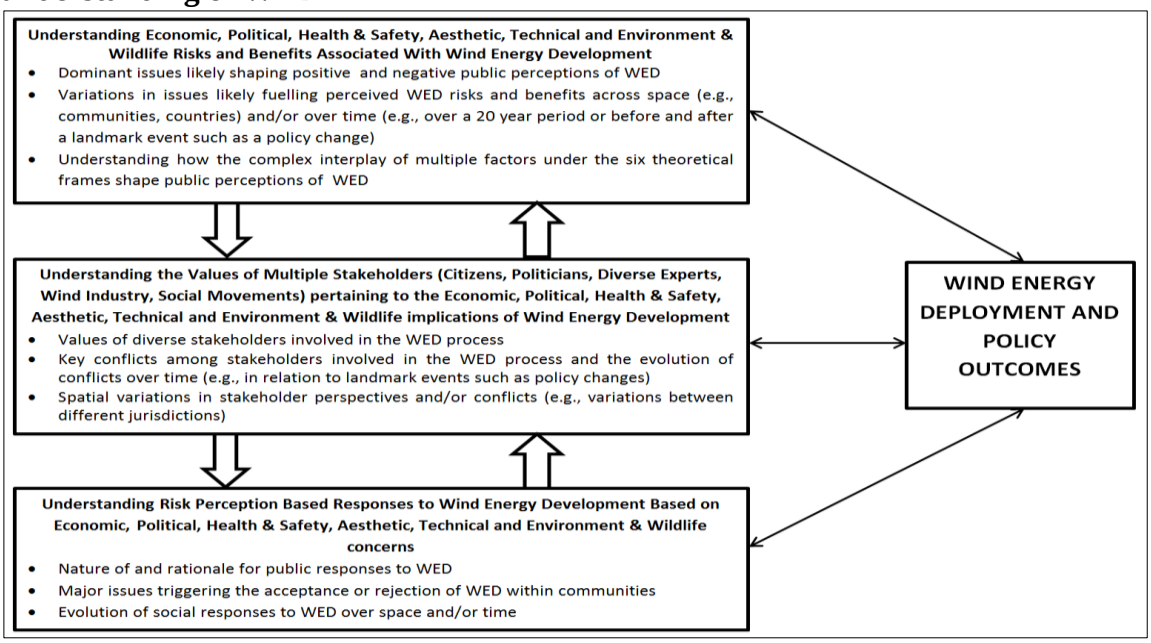
Amongst these broad gaps in emergent academic coverage we see the need for a more concerted development of theory and method linkages. For instance Luhmann's (1989) theory of ecological communication has been used to understand how functional subsystems (Economy, Religion, Politics, Law, Education and Science) frame responses to environmental risks in industrialized societies. According to Luhmann (1989), communication between these subsystems represents the means through which societies respond to environmental disturbances. Under the Socio-Political Evaluation of Energy Deployment framework (SPEED), Stephens, Wilson & Peterson (2008) call for an integrated analysis of economic, social, political and cultural factors impacting the deployment of energy technologies. Their framework also highlights the importance of public discourse in shaping energy deployment. In this spirit, Stephens *et al* (2009) conducted a multistate level analysis of wind energy within US media by integrating Luhmann's theory with the Socio-Political Evaluation of Energy Deployment framework (SPEED). Their work brings about some of the necessary integration of alternative theoretical constructs or frames - - namely economic, environment & wildlife, health &

safety, political, aesthetic and, technical factors - - that we indeed see in the communications of social movements contesting WED across the world (see National Wind Watch, 2014) and in the experiences of local communities struggling with development processes (e.g. Songsore *et al*, 2014a). We build on this work by providing methodological roadmaps that illustrates how alternative and competing frames manifest in WED discourses.

A further theoretical motivation is found in the political ecology (PE) of nature-society relations (Walker, 2006; Walker, 2005; Adger *et al*, 2001). A major tenet of PE is that environmental issues play out on multiple spatio-temporal scales (McCarthy, 2002; Zimmerer & Bassett, 2003). In utilizing PE theory to study WED in rural Catalonia, Zografos (2009) discovered that conflicts were more rooted in historical center-periphery tensions rather than explicit concerns about wind power. The methodological roadmaps provided in this paper could be applied to understand WED over space and across time. Indeed PE suggests that "humans appropriate, contest, and manipulate the world around them through dialectical processes" (Paulson *et al*, 2003; 205). In response to most existing studies of the social aspects of WED, Aitken (2010; 1834) warned that "literature must abandon the assumption that it knows who is ‘right’ and instead must engage with the possibility that objectors to wind power are not always ‘wrong’". Recognizing the importance of stakeholder dialectics and Aitken’s (2010) assertion, we also provide a methodological roadmap for utilizing media CA to understand dialectics among WED stakeholders.

In the context of these emergent research gaps and theory-to-method imperatives, we are led to ask: "What are the major risks and benefits associated with WED?", "What are the implications of various WED stakeholder values for deployment and policy outcomes?" and, "How are communities responding to WED and policies based on risks associated with the technology?" Figure 2.1 identifies of the priorities facing researchers asking these questions; questions, we argue, that demand a clearer articulation of the connections between theory and method as well as clear methodological guidelines for seeking answers. The approaches – or better, strategies – we propose to understand discourses of WED are also aimed at integration of experiences across time and space.

Figure 2.1 Summary of methodological roadmap for gaining a holistic understanding of WED



2.2 Rationale for content analysis

In order to understand the WED process, it is necessary to document, analyse and interpret social responses, public perceptions, stakeholder conflicts, discussions and

debates surrounding the technology. Textbook parlance says that content analysis is "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the context of their use" (Krippendoff, 2012; 382). Due to the versatile nature of the methodology, it continues to be used in several disciplines (Riffe, Lacy and Fico, 2014). Its fluidity and flexibility is a fundamental rationale for our assertion that CA is a meaningful approach to the discourses of WED. Yet while it has already been used in multiple studies, we identify important gaps in the emergent body of research on WED - - not unlike the use of CA in other domains - - is that researchers have not been explicit enough about their CA process and the details of the technique. We assert that research outputs and, ultimately, validity and reliability, are bolstered with more explicit methodological exposition.

The two main variations of CA are (1) quantitative CA, which is generally used to analyse the manifest contents of texts (e.g., word frequencies and article length) and (2) qualitative CA, which is usually employed for the analysis and interpretation of the latent contents of texts (i.e., meanings behind texts) (Krippendorff & Bock, 2009; Riffe, Lacy & Fico, 1998; Berg & Lune, 2004). While fluid and flexible, the strengths of methodology lie in its core requirements of validity and reliability. Potter and Levine-Donnerstein (1999; 258) contend that CA is "a social scientific methodology that requires researchers who use it to make a strong case for validity and reliability". The rigor of a well operationalized CA makes it a methodology suitable for the analysis of complex issues riddled with conflict. Additionally, CA provides tools for effective data reduction (Namey *et al*, 2007; Ryan & Bernard, 2000); hence, helping researchers make sense of large data sets (Stemler, 2001) including as they develop through time and among alternative places.

What provides further credence to CA as a methodology for the study of extensive public discourses is its emphasis on reliability (Elo *et al*, 2014). Others have covered the methodology in detail (Cavanagh, 1997; Kippendorf, 2012) thus we only highlight high-level features here. Following the development of an analytical codebook, intercoder reliability tests are performed by training others to code the same (or a sample of) texts, computing reliability scores (see Krippendorff, 2012; Riffe *et al*, 2014 for test details) and arriving at a consensus (not unlike a Delphi policy analysis) on how final coding should proceed. This kind of process strengthens the analysis by raising its replicability via consensus. Since it is near impossible to avoid disagreements, Gottschalk (1995) contends that coding errors can only be minimized. In our research experience, intercoder reliability tests provide important feedback through which codebooks are developed and refined.

Finally, if CA can be used to integrate experiences across time and space, it must offer standards of validity (Titscher & Jenner, 2000). On the one hand documentation and analysis should be internally coherent but on the other we also wish to 'scale up' collected experiences for generalization. In the words of Malterud (2001; 484), "internal validity asks whether the study investigates what it is meant to, whereas external validity asks whether the context or findings can be applied". Internal validity of the CA is best achieved by creating mutually exclusive categories within the analytical codebook, and achieving an acceptable level of intercoder reliability prior to coding (Cavanagh, 1997; Krippendorff, 2012). External validity is best achieved by sampling relevant sources for the analysis and choosing a sufficient sample size that is representative of the study context. As well, it is enhanced by drawing links between the study outcomes and

findings from other studies on WED, especially those conducted within the same or similar jurisdictional contexts. Information from policy documents and websites of various interest groups (e.g., WED organizations and social movements) could also be used to strengthen external validity. Combining CA with other methodological approaches such as surveys and/or interviews also enhances external validity (Mayring, 2003).

2.3 Justification for utilizing media contents

The data that feed content analysis may come from many different sources including: citizen letters (see Aitken, McDonald & Strachan, 2008); websites (see Stein, 2009); interviews (see Liska, 1994); policy documents (see Lemiengre *et al*, 2008) and media sources (see Deignan, Erin and Hoffman-Goetz, 2013). The latter - - in particular print and Internet-based media - - is our focus here because of their role in reflecting and shaping public opinion and the broad range of issues they address. The methods presented in this paper are nonetheless applicable to other contents (e.g., website contents, interviews and policy documents). There are several benefits associated with utilizing media contents to understand WED within various jurisdictional contexts. First, media reports help us understand the evolution of WED discourses over time since coverage is continuous. A general search for the key word "wind energy" within the Factiva database for instance reveals that newspaper coverage of the technology dates as far back as 1978. The opportunity for consistent retrospective documentation and analysis is a particular strength. Archives of media sources could be used to understand the evolution of WED over time or in relation to landmark events such as policy changes and changes in

government (e.g., Songsore and Buzzelli, 2014a). Such longitudinal studies could complement existing and ongoing research which is often cross-sectional in design.

While it is challenging and resource intensive to conduct WED studies across several jurisdictions, media contents could be used to understand the context of WED from place to place. Studies seeking to understand variations in WED across several jurisdictions could be conducted on a national, regional or local scale via media CA. For example, through a comparative media content and frame analysis in three US states, Stephens *et al* (2009) unearthed state-level variations in WED discourse. The ability of the media to capture perspectives of a wide array of wind energy stakeholders (e.g., developers, communities, politicians, social movements) adds to its comprehensiveness. Ellis *et al* (2007, p.521) contend that "it appears that key issues facing wind farm development are not 'objective' policy blockages, but clashes of values related to, *inter alia*, governance, technology…, precisely those that defy rational quantifiable explanation". McClymont & O'Hare (2008) have also made similar claims. Within WED research, there exist major gaps in our understanding of stakeholder conflicts and how these potentially affect WED and policy outcomes. As media contents could potentially be characterized by uneven coverage or political biases, the researcher must take care in interpreting how alternative voices are (not) represented in diverse media platforms; in other words, the roles played by the medium itself.

To better understand media roles, Iyengar & Reeves (1997) established a media effects framework which characterizes the media as informers, agenda setters, framers and persuaders. As an example of the media's informational role, it is estimated that

"more than three in four Canadians read newspaper content across print, digital and mobile platforms each week" (Newspapers Canada, 2014). These statistics reflect the extent to which the media acts as an information source within the Canadian context. But their role is even more fundamental. Agenda setting refers to the ability of the media to tell us what to think about (McCombs and Shaw, 1972; Birkland, 2003). The concept focuses on the frequency of coverage, suggesting that issues which receive greater media coverage are more likely to be considered salient in the public's eyes (McCombs & Shaw, 1972; Wang & Gantz, 2010). Though the concept has evolved over time, its central focus remains on salience transfer (McCombs, 2005). Indeed McCombs (2004) refers to framing as second level agenda setting involving selecting particular themes or related attributes for inclusion in media reports. Entman (1993; 3) contends that framing involves "selecting some aspects of a perceived reality and making them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described". Through framing the media suggests "what is at issue" (Gamson and Modigliani, 1989). Framing therefore plays a major role in shaping how audience process and interpret news (Simon & Jerit, 2007; de Vreese, Boomgaarden, & Semetko, 2011). The concept of framing remains heavily contested (see Borah, 2011), e.g., Scheufele (1999) asserts that framing research is characterized by a plurality of theoretical models. Nonetheless this body of research has generally focused on diverse attributes of media coverage (Zhang and Min, 2013). Hence, the need for rigorous and explicit CA is all the more important given the care needed to interpret content in the media.

2.4 Media Content Analysis Protocol

This section presents the protocol for the three strands of media analysis presented in this paper. Specific issues covered include sampling and preparation of media sources for analysis, codebook development, coder training, intercoder reliability assessment and the coding process. Additionally, we provide guidelines for ensuring that the core requirements of CA are met at every stage of the analysis process. We develop this protocol with the use of QRS NVivo software, but stress that many alternatives exist.

2.4.1 Sampling and Data Preparation

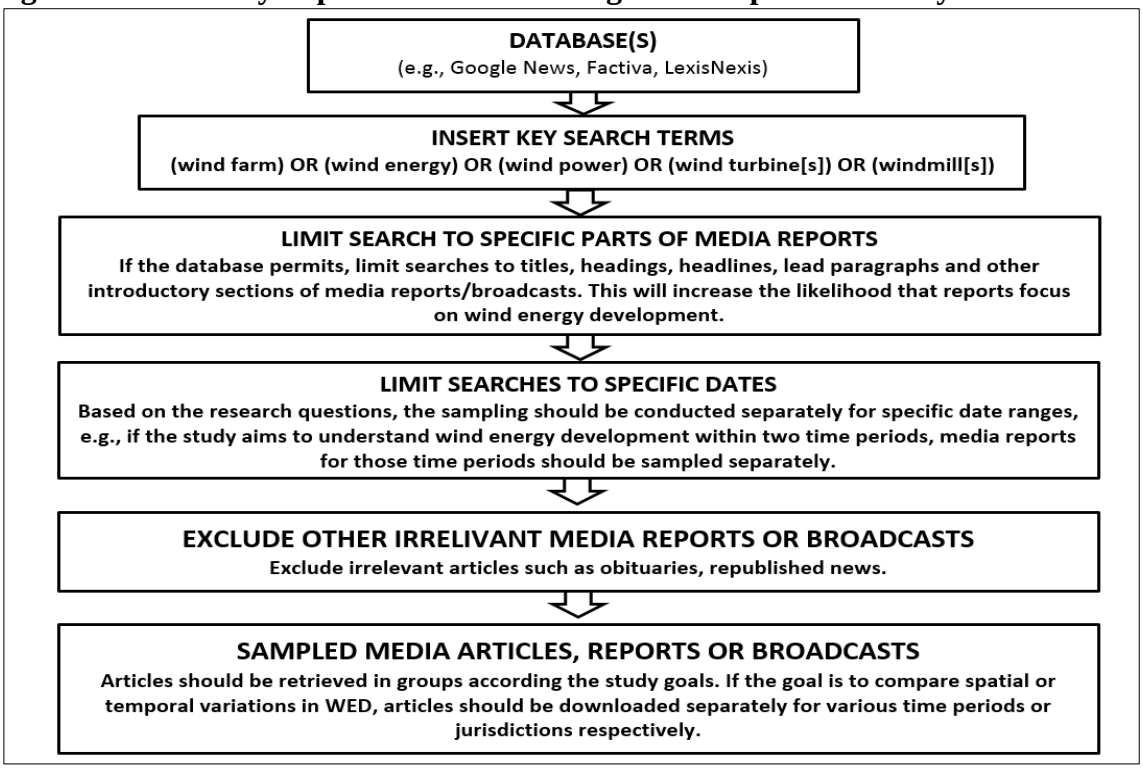
The aim of the sampling procedure is to gather relevant media articles or broadcasts for analysis, i.e., articles that focus on WED. The sampling and data preparation procedures outlined here apply to all three strands of analyses. Since the sampling is critical, it should be carefully executed with the following considerations:

- Availability and accessibility of media reports is a primary determinant of media outlets that can be sampled. News reports should thus be available on a database within which articles are searchable and retrievable. The databases must contain advanced search features that can be used to (1) retrieve articles containing specific key terms, (2) limit searchers to specific dates based on the study period chosen for the study. Additionally, the database should contain archives of articles dating back to the time period chosen for the study. Examples of such databases are Factiva, Google News and LexisNexis. In cases where a few articles are being sampled (i.e., sampling from a rural newspaper with no database accessibility), hard copies of news (e.g., newspapers) could be manually skimmed and documented (e.g., scanned or photocopied) for analysis.
- Media reports sampled should be circulated within the jurisdiction(s) being studied. This will ensure that news reports focus primarily on issues pertaining to

the study region. Based on the study context, these media sources could be local, national, regional or even international. Local media sources are for instance more suitable for studies at the community scale, since they are instrumental in "forming the cognitive maps that citizens use to understand their communities" (Yanich, 2001; 221). Local news have also been found to follow issues of local interest (Moy *et al*, 2004).Based on national media sources often covering a broad range of topics (Schäfer, 2009), national media sources will more likely be suited for studies on a national scale.

- Media sources sampled should possess a wide reader or listener base within the study area of interest. Exposure and consumption is directly related to the 'mirror and moulder' roles of the media, including such effects as agenda setting and framing noted earlier.
- Choosing which media outlets to sample is critical. Decades of media based research show that media outlets sometimes privilege certain political viewpoints or interest groups (e.g., Lubbers, Scheepers and Vergeer, 2000; Eisinger, Veenstra and Koehn, 2007; Curtice, 1997). Based on this finding, it is critical to ensure that media reports are sampled from a group of sources that do not possess similar political inclinations. Achieving this balance will ensure that the study outcomes capture a broader array of issues relevant to holistically understanding WED within specific jurisdictional contexts.
- Purposive sampling is best suited for retrieving media reports for this analysis. Media contents should therefore be sampled based on the core aims of the research (Riffe, Lacy and Fico, 1998), i.e., their focus on WED and the study date(s). Figure 2.2 summarizes the search protocol for retrieving articles. The retrieval process involves searching for articles that mention key terms pertaining to WED (see Stephens *et al*, 2009; Songsore *et al*, 2014a), limiting searches to the headline or lead paragraph of media reports to increase the likelihood that the articles focus on WED (LexisNexis, 2014) and limiting searches to the study date(s).

Figure 2.2 Summary of protocol for retrieving media reports for analysis



- The spatio-temporal structure of the study should inform the downloading of articles, e.g., if the study aims to understand WED and policy outcomes over multiple spatial and/or temporal scales, articles should be downloaded separately for each of the spatial and/or temporal scale of interest. This makes it easier to analyse clusters of articles separately and make comparisons to account for spatial or temporal variations in WED and policy outcomes. Prior to the analysis, all sampled articles should be manually skimmed to ensure they are relevant to the research context (i.e., WED). This is important because the aforementioned key search terms could be used in context not related to WED, e.g., 'windmill' dunk could be used in the context of basketball (Songsore & Buzzelli, 2014a

2.4.2 Pre-analysis protocol

Mapping out a systematic procedure for an effective CA can be daunting. Though we acknowledge the flexibility of the CA methodology, we attempt to provide a systematic set of analytical procedures appropriate for answering the research questions

under consideration while also satisfying the core requirements of CA. We make no attempts to provide a process 'set in stone'. The steps provided here are derived from a detailed review of existing CA studies and years of refining our own research protocol.

For all variations of CA to be described within the paper, we suggest starting out the analysis with these steps to help minimize errors and obtain desirable results that meet the requirements of the methodology. These steps should precede each of the three analytical approaches that will be discussed:

- Preliminary analytical codebook development: Contrary to other data analysis techniques such as discourse and interview analysis, replicability is a requirement of CA. With qualitative CA requiring interpretation, it is important to minimize analytical subjectivity by formulating strict guidelines for coding. This can be achieved by creating an analytical codebook, which acts as "the heart of a content analysis" by explaining "how the variables in the study are to be measured and recorded on the coding sheet or another medium (Riffe, Lacy and Fico, 1998; 59). In the context of this paper, analytical codebooks should for instance provide clear and concise definitions of what should be coded as an economic risk or economic benefit of WED.
- Analytical Unit definition: The codebook should also provide a strict definition of the analytical units to be used for coding. The analytical units refer to parcels of the texts coded as representative of specific contexts, e.g., "letters, words, sentences, portion of pages or words….." (Elo & Kyngas, 2008; 109). Since the quantitative CA involves collating word frequencies, words will serve as analytical units. The qualitative content analysis will however involve interpreting and coding media contents. Depending on the structure of the data being dealt with, sentences or paragraphs containing themes of interest (e.g., WED risks and benefits) could be used as analytical units.

- Intercoder reliability: The creation of the analytical codebook should be succeeded by an intercoder reliability test. The aim of the test is to ascertain efficacy of the analytical codebook. The test reveals the extent to which different coders arrive at the same results when data is coded privately with strict adherence to the analytical codebook (Shemla *et al*, 2014). Hence it strengthens the CA by making the process more trustworthy and reliable. In our research experience, intercoder reliability tests have always been a rigorous mechanism for strengthening the analytical codebook prior to the actual analysis. The tests are conducted by first training researchers involved to understand the codebook and identify instances which should be coded. In our research experience, coding sample articles with researchers makes the training process more effective. This step should then be followed by distributing a sample of the same articles among the researchers to be coded privately. After the coding, intercoder reliability tests should then be performed to assess the level of agreement among the coders. Scott's pi index (Scott, 1955), and Cohen's kappa (Cohen, 1960) are among the most commonly used measures for assess the level of intercoder reliability (Shemla *et al*, 2014; Riffe *et al*, 1998; 2014). After obtaining a satisfactory level of intercoder reliability, researchers can then proceed to code all the media contents. Although analytical codebooks have been provided for all variations of CA discussed here, it is crucial that researchers adopting the codebooks provided conduct intercoder reliability tests using samples of their data in order to make any needed amendments to the analytical codebook to fit their research context.

2.5 Analytical Strands

The preceding section outlined the CA process that brings us to the analysis stage. This section provides details of the three variations of media CA that could be employed collectively to gain a more holistic understanding of WED and policy outcomes. As noted in the introduction, the first analytical strand focuses on understanding media discourse and public perceptions of WED, while the latter two sections focus on understanding stakeholder conflicts and social responses to WED respectively.

2.5.1 Analytical Strand 1: Media discourse and public perceptions of WED

The first variation of media CA that will be presented in this subsection could be used to answer these kinds of research questions:

- What are the dominant issues shaping public support or resistance to WED?
- What is the potential role of the media in shaping public responses to WED?
- Based on the potential impacts of media discourse on public perceptions, how have public perceptions of WED likely evolved over time and/or with respect to various landmark events such as policy changes?
- How does the interplay of multiple factors likely shape public perceptions of and responses to WED?
- How do public perceptions of WED vary spatially (e.g., between jurisdictions)?

To answer the aforementioned questions, we suggest applying qualitative CA or a combination of quantitative content analysis and Key Word in Context Searches (KWICS's). While the former has been applied by Stephens *et al* (2009) the latter is demonstrated in a study by Songsore & Buzzelli (2014a). In the study by Stephens *et al* (2009), this approach was utilized to unearth variations in WED discourse across three US states, while Songsore & Buzzelli (2014a) utilized the approach to understand variations in social responses to WED with respect to Ontario's Green Energy Act.

2.5.1.1 Qualitative content analysis

Answering the aforementioned questions via qualitative CA will involve using the six theoretical frames discussed earlier as major themes within the analytical codebook. The coding process could then involve manually reading and coding the risks and benefits associated with WED under each of the six frames. A sample analytical codebook for the analysis is presented in Table 2.1.

To make the coding instructions clearer, studies utilizing this strand of CA should draw examples from the media contents being analysed. Figure 2.3 shows a sample research project organized within NVivo 10 to code risks and benefits associated with WED under four of the six frames.

Table 2.1 Analytical codebook for capturing risks and benefits associated with WED

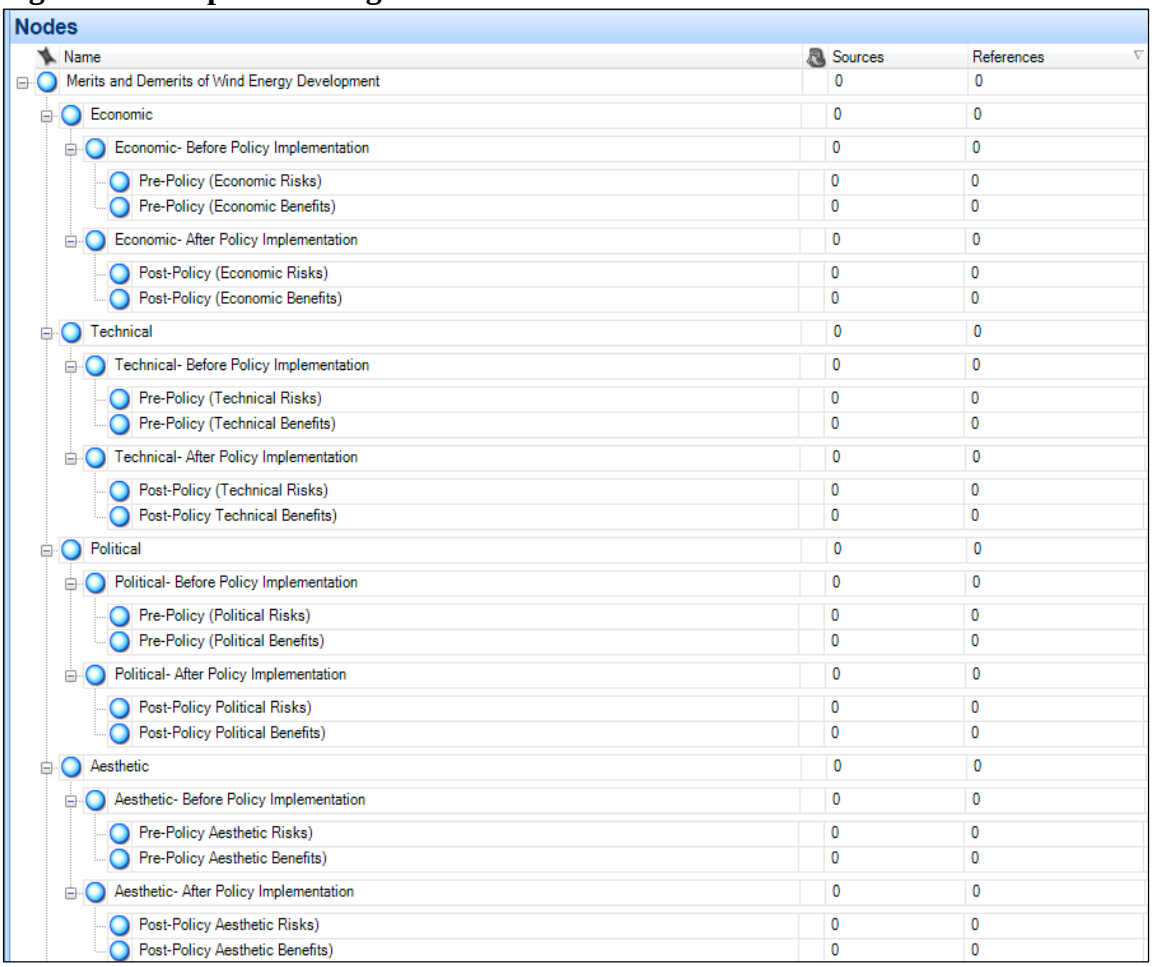
Frames	**WED Risks** (rationale for resistance)	**WED Benefits** (rationale for acceptance)
Economic	Economic risks associated with WED, e.g., expensive, subsidies too high, tax dollar misuse, high electricity bills, high risk investment, poor job creation, fall in property values, compromise tourism….	Economic benefits associated with WED, e.g., investment opportunities, job creation, cheap technology, attract investors, boost economy, community economic benefits, tax returns….
Health and Safety	Health risks associated with WED, e.g., several symptoms (e.g., headache, tinnitus, vertigo, stress & sleep disorders), noisy turbines…..	Health benefits of WED, e.g., replace unhealthy and polluting energy generation technologies, no health effects, safe technology…..
Political	Legal and political risks associated with WED and the development process, e.g., injustices in development process, neglect of public rights, poor policies, no public participation, bad planning, government ignoring community concerns…..	Political benefits of WED and the development process, e.g., government satisfying international standards such as Kyoto, good policies, ameliorate energy insecurity, WED as duty of any responsible government, government aiming to protect citizens……
Aesthetics & Cultural	Negative aesthetic and cultural ramifications of WED, e.g., disrupt beautiful landscapes, compromises cultural heritage features, destroys recreational landscapes…….	Aesthetic benefits of WED, e.g., turbines look beautiful and add positively to the aesthetics of landscapes.
Environment & Wildlife	Negative impacts of WED on the physical environment, flora and fauna, e.g., insignificant contribution to GHG emission reductions and climate change, destruction of flora and fauna (e.g., birds, bats, trees), cause of species extinction, results in deforestation	Environmental and wildlife benefits of WED, e.g., turbines have minimal impact on wildlife, turbines create a healthier environment for wildlife to thrive by eliminating unhealthy generation technologies……
Technical	Technical weaknesses of WED, e.g., variable output due to reliance on wind, unreliable source of energy, transmission limitations, maintenance is complicated…….	Technical benefits of WED, e.g., high energy output levels, technology utilizes wind which is a free resource, technology consistently evolving and getting better……..

Codebook structure adopted from Stephens et al (2009) with examples from Songsore & Buzzelli 2014a

The coding should be organized according to the aims of the study, e.g., within Figure 2.3, the aim is to capture the merits and demerits associated with WED before and after a policy change. Hence, the nodes (i.e., coding categories) under each frame are organized to capture merits and demerits before and after the policy was implemented. Similarly, if a study aims to capture spatial variations in the risks and benefits associated

with WED, multiple iterations of the coding structure should be created for each region under consideration. This will allow for easy comparisons of outcomes pertaining to the regions of interest. Within Figure 2.3, the numerical values in the reference column indicate the number of instances coded under each node. Values occurring within this column could be graphed to show variations in the prominence of WED risk and benefits under each of the six frames across space and/or over time. Based on the agenda setting theory, variations in coverage of under each of the six frames could subsequently be used to predict issue salience within the jurisdiction(s) under consideration.

Figure 2.3 Sample of coding structured within NVivo 10



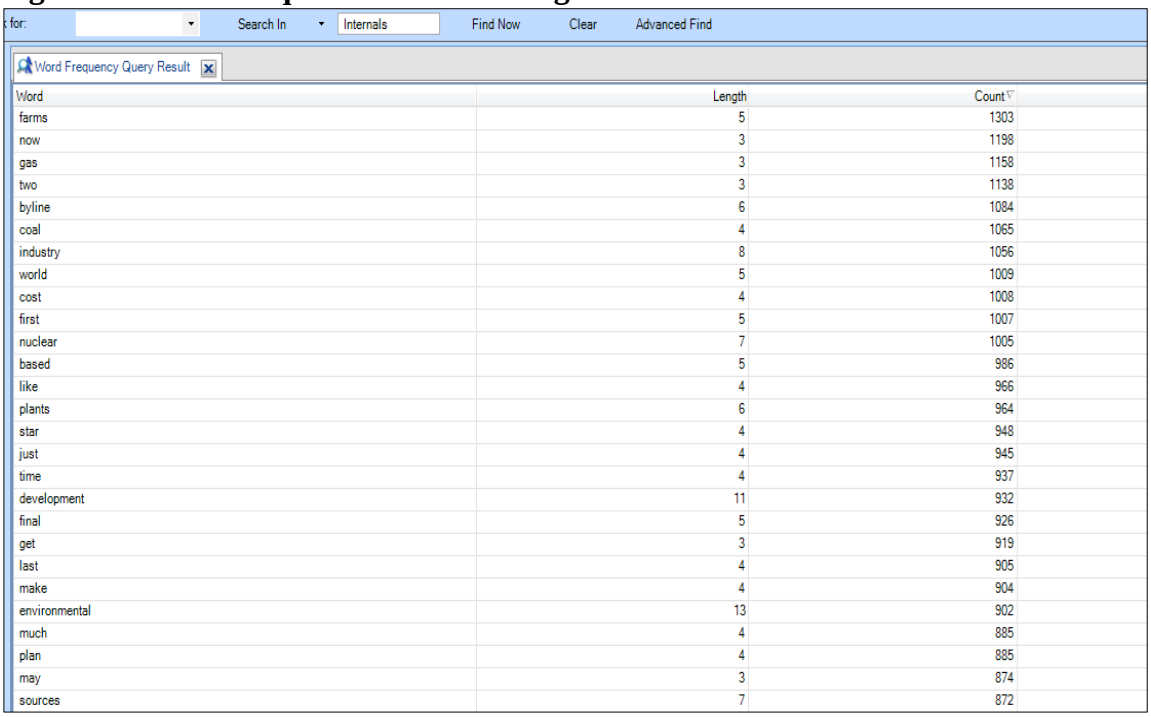
Note: Figure displays coding structure for only four of the six frames (Economic, Technical, Political and Aesthetics)

2.5.1.2 Quantitative content analysis and Key Word in Context Searches

The second approach suggested for answering the aforementioned research questions involves using quantitative CA and KWICS. This analysis could proceed with a quantitative content analysis which will involve categorizing key words within media reports under each of the six frames and using the frequency of the words under each frame to assess agenda setting (i.e., variations in prominence across the 6 frames).

To effectively generate key words under each of the six frames researchers could first generate the frequency of all words within all media reports. The words could then be displayed in descending order (i.e., most prominent to least prominent). A segment of word frequencies generated in ascending order within NVivo is displayed in Figure 2.4. Prior to placing words under the six frames, limits may be set on the maximum number of times a word should occur to be placed under a frame. This is a subjective decision which helps with data reduction. For instance, within a sample of 1,875 newspaper reports that were used for a previous study by Songsore and Buzzelli (2014a), relevant words occurring between 13,717 and 40 times across all newspaper articles were placed under each of the six frames where appropriate. These words constituted 8.6 percent of all words used in all the newspaper articles.

Figure 2.4 Word frequencies in ascending order



Word	Length	Count
farms	5	1303
now	3	1198
gas	3	1158
two	3	1138
byline	6	1084
coal	4	1065
industry	8	1056
world	5	1009
cost	4	1008
first	5	1007
nuclear	7	1005
based	5	986
like	4	966
plants	6	964
star	4	948
just	4	945
time	4	937
development	11	932
final	5	926
get	3	919
last	4	905
make	4	904
environmental	13	902
much	4	885
plan	4	885
may	3	874
sources	7	872

After skimming through word frequencies in ascending order and placing words under preliminary frames of relevance, uncertain words under each frame should be reviewed to verify their frame of fit. Thus, while some words clearly fit under specific frames (e.g., headaches clearly falls under the health frame), other words could be confusing. Word trees could be used to verify words that do not seem to fit under their preliminary frames. Word trees display the dominant contexts in which words are used across all articles. A sample word tree for the word ‘bat’ is displayed in Figure 2.5. From the Figure, the word ‘bat’ was mainly used in conjunction with birds as well as in the context of bat fatalities and bat migration. The word ‘bat’ therefore clearly falls under the wildlife frame.

Figure 2.5 Sample word tree for the word "bat"

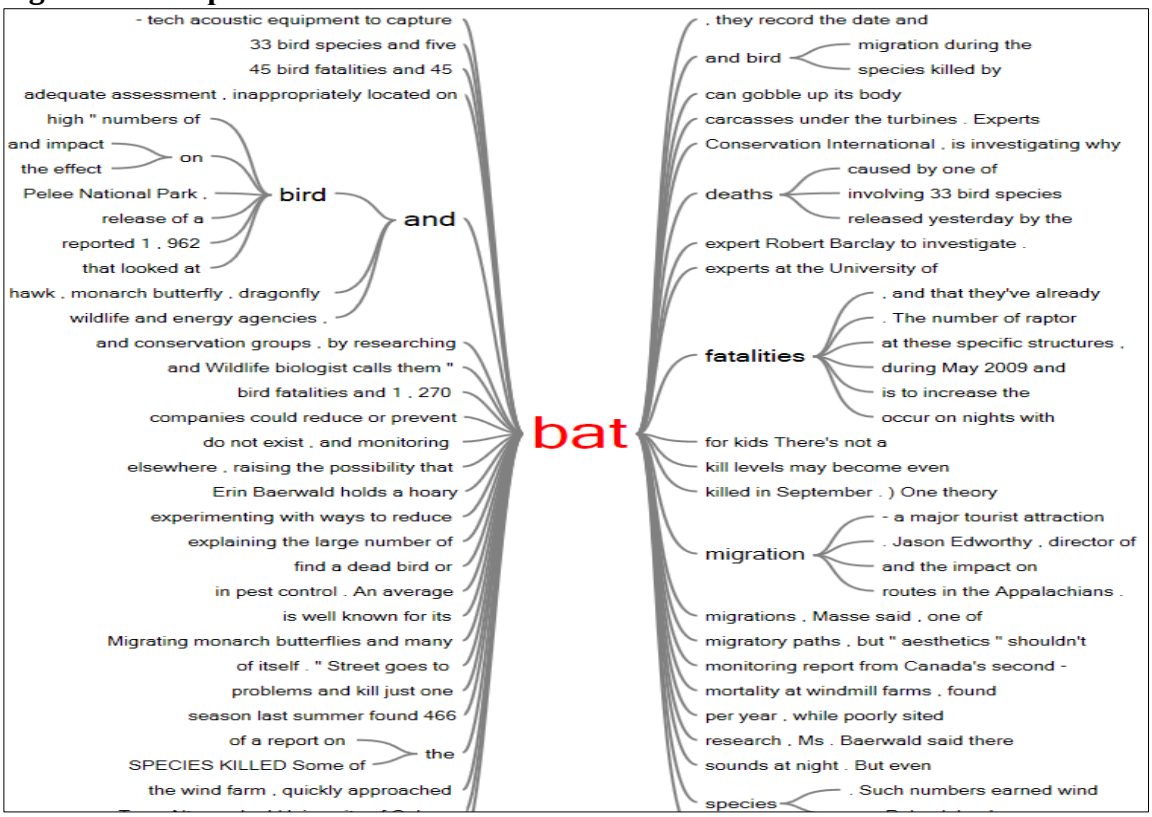


Table 2.2 shows an example of a set of words that were compiled under each of the six frames by following the aforementioned procedures. Following the placement of words under the six frames, the relative prominence of each frame could be ascertained by conducting word frequency counts to obtain the total number of times all the words under each frame occur within all media reports.

Table 2.2 Sample words compiled under the six frames

MAJOR CODES	SUBCATEGORY WORDS
Economic	Price, investment, money, financial, property, Economy, Tax, Capital, Commercial, Dollars, Business, Trade, Sales, Financing, Firms, Invest, tariff, Economics, Taxes, Dollar, Employment, Taxpayers……
Environment & Wildlife	Environmental, environment, climate, Habitat, Rivers, Birds, Bats, Wildlife, Kill, Killed, Die, Bat, Animals, Eagles, Whales, Ducks, Butterflies, Flies, Duck, Owls, Collision Geenpeace, Ecology, Ecological, Ecosystem……
Health & Safety	Health, Noise, Sound, Setbacks, Safety, Medical, Hearing, Sleep, Safe, Sick, Vibrations, Headaches, Accident, Noisy, Hazard, Symptoms, ill, Decibels, healthy, Environmentalists, Stress, disease…….
Political	Government, Green Energy Act, Federal, Policy, Premier, Ministry, Municipal, Government, Political, Legislation, Politicians, Policies, Law, Bylaw, Jurisdictions……
Aesthetic & Cultural	Natural, land, Landscape, Visual, Beauty, Tourism, Scenic, Shadow, Aesthetic, Aesthetics, Lakeview, Tourist, Aesthetic, Culture, Recreational, Cultural, Landscapes……..
Technical	Grid, Capacity, Technology, Generate, Generation, MW, Manufacturing, Transmission, engineering, Industry, Technology, Generators, viability, Technological, Gigawatt……

Words drawn from Songsore and Buzzelli, 2014

The second part of this analytical protocol involves using KWICS to document the context in which words compiled under each of the six frames are used (i.e., in the context of WED risks or benefits). This can be conducted by carrying out a search for all words compiled under all the frames, highlighting them and documenting the context of their use under their respective frames (i.e., to describe WED risks and/or benefits). Figure 2.6 shows an example of words highlighted through a KWICS conducted in NVivo. Similar to the first approach discussed, this method will result in the dominant risks and benefits associated with WED under each frame. Utilizing the agenda setting theory, the frequency of each frame could be documented and used to predict issue salience within the public's eyes.

Figure 2.6 Words highlighted following a KWICS using words under all 6 frames

In Perth County, Countryside Energy Co-operative Inc. is a Milverton- based organization with plans to harness wind power, reduce pollution and pump money into rural communities.

General Manager Doug Fyfe said he hopes construction starts by the spring of 2008 on the first of two 10-megawatt wind farms, each of which will require an investment of $20 million.

Fyfe says there is much investor interest in both projects, one to go at Goderich and a second near Milverton.

In some areas, co-ops are competing for sites with large companies such as Canadian Hydro.

The difference between the two isn't lost on Fyfe.

"We are going to have local investors and the vast majority of the money will go to local investors and that money circulates eight times within the community."

Fyfe doesn't see a problem attracting investors. Countryside Energy now has more than 57 members and a lot of people were interested even before the campaign to raise funds started.

"People see it as the way forward. They are tired of getting smogged out and oil prices are making people think. We can offer energy at stable prices and no pollution," he says.

Closer to home in Waterloo Region, a Baden-based co-op called LIFE (Local Initiative for Future Energy) plans to build a $20-million, 10-megawatt wind farm on Erb Street west of Waterloo. It's selling memberships for $175 and shares for $50.

LIFE president Linda Laepple said her group hopes to raise half of the money it needs through investors and get the rest at banks or credit unions. She said she figures that with prices set by the province, the venture should pay for itself in seven to 11 years.

Unfortunately, says Laepple, local opportunities are limited. There aren't that many prime sites for wind in this

The two approaches of CA discussed in this section possess relative (de)merits. The first approach (qualitative CA) tends to be time consuming, since all sections of each article have to be read in detail. Yet the use of qualitative content analysis tends to be more rigorous, since the reading of all the articles ensures that no details are missed. Certain risks and benefits which are not framed using key words could be missed by researchers employing KWICS. Conversely, the use of KWICS is a faster approach, since researchers are only compelled to read sections of the texts with highlighted words.

2.5.2 Analytical Strand 2: Understanding dialectics and conflicting values among WED stakeholders

This strand of CA could be utilized to answer the following research questions:

- What are the values of diverse stakeholders involved in the WED process?

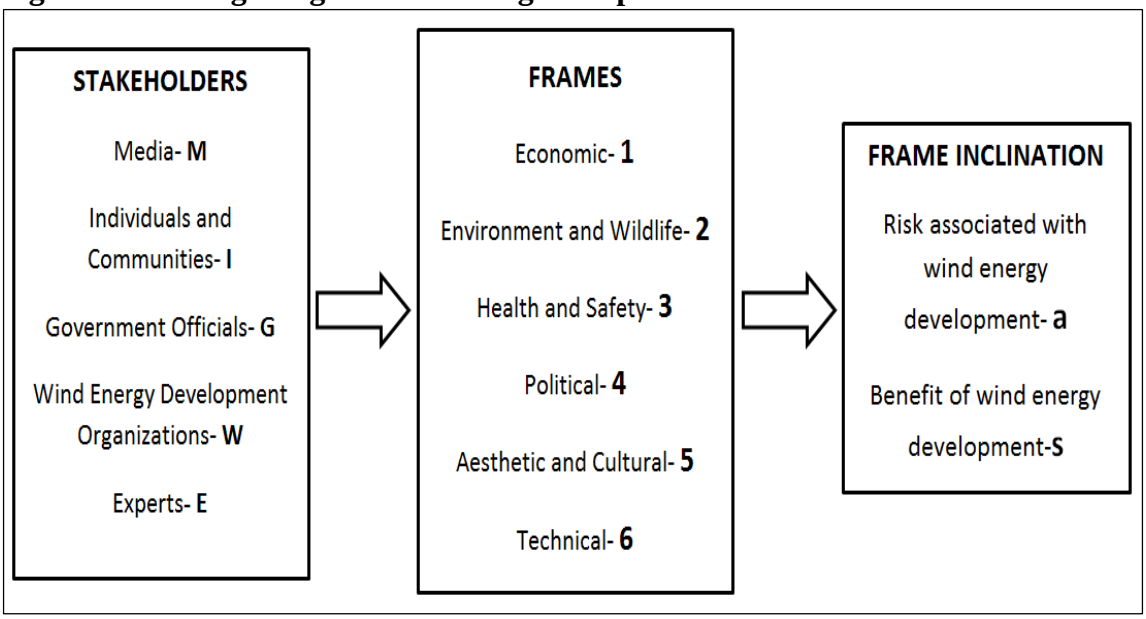
- What are the key areas of conflict among stakeholders who play a role in the WED process?
- How have stakeholder values and conflicts evolved over time and/or in relation to certain landmark events such as policy changes?
- How do stakeholder values and conflicts vary spatially (i.e., between different jurisdictions)?

WED and policy outcomes could be influenced by conflicts among stakeholders engaged in the development process. Nonetheless, there remains a dearth of research in this area. With the exception of a few cases (e.g., Fischlein *et al*, 2010), a majority of studies on WED continue to focus on social acceptance. In an attempt to bridge gaps between media content analysis and the policy sciences, Howland, Becker & Prelli (2006) introduced an original CA categorization system for mapping the rhetorical landscape of policy formulation. The system helps identify and categorize policy oriented arguments and their inclinations, while noting which stakeholders are responsible for the arguments.

Within the analytical framework, Howland *et al* (2006) call for the utilization of various alphanumeric characters to capture and conceptualize policy oriented arguments. Demonstrating the use of the protocol in the context of the Montreal Protocol Ozone treaty, they attach characters to the inclination of arguments (i.e., for/against the treaty), their inclinations (i.e., economic, political or social) and scope (i.e., international or domestic). In attempt to understand stakeholder conflicts surrounding WED through media content analysis, we suggest attaching characters to stakeholders, the frame of their arguments based on the six frames, and the inclination of their arguments (i.e., WED risk or benefit).

Based on our research experience, we suggest using 5 groups of stakeholders (individuals & communities, political officials, experts, wind industry and the media) to conduct this analysis. It is noteworthy that the choice of stakeholders may vary based on the socio-political context within which the study is being conducted. Additionally, while it could be argued that the media are not a WED stakeholder, the rationale for adding the media is to capture which perspectives reporters explicitly advance. Figure 2.7 presents a sample list of all three broad categories with assigned alphanumeric values.

Figure 2.7 Coding categories with assigned alphanumeric values



While detailed definitions of the six theoretical frames are presented in Table 2.1, the stakeholder groups to be utilized for the study and justification of choosing them are presented as follows:

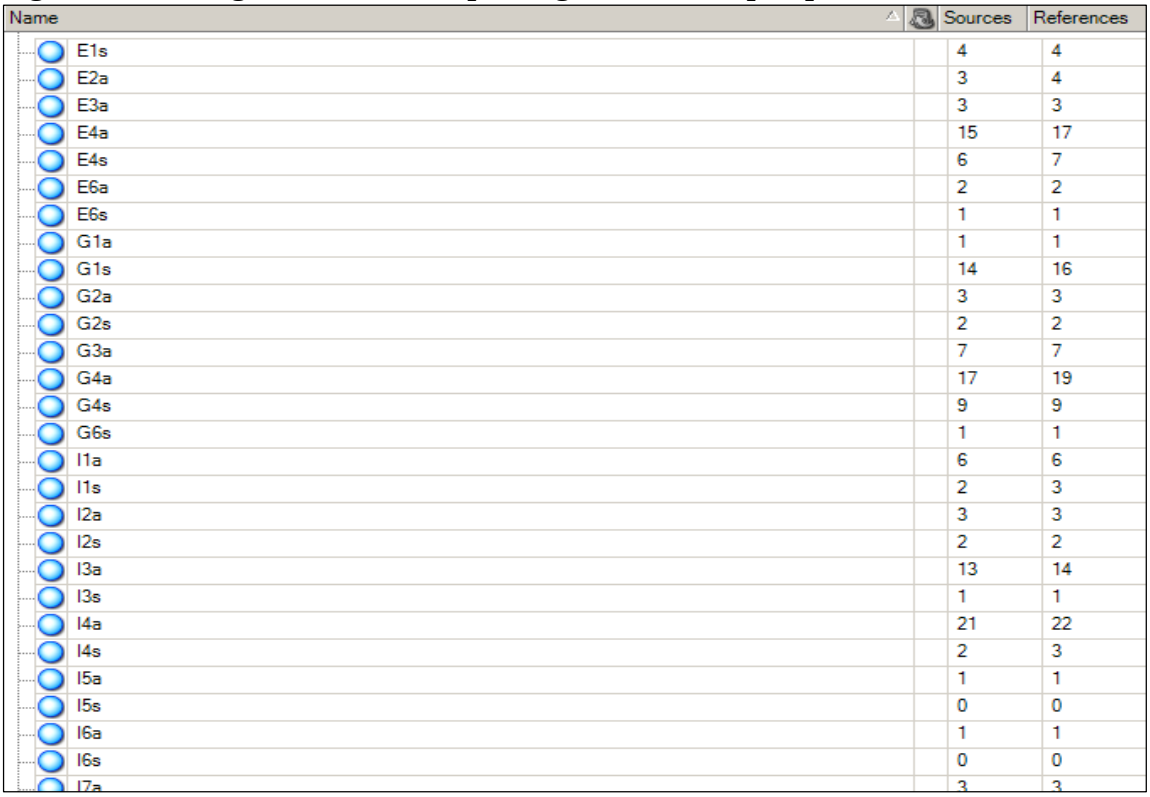
- Media: While the media are not directly involved in the development of wind power, their influential role and their ability to shape public discourse makes them relevant. Discourses to be coded under the media category should be those advanced “explicitly” by media reporters.

- Individuals and Communities: This category of actors includes individuals and communities who are potential or actual hosts of WED projects. Since WED has resulted in the formation of various social movements either contesting or promoting the development of the technology, the perspective of such groups should be included in this group of responses.
- Political officials: Political officials include local, municipal, regional and national government officials. This category also includes ministers of diverse sectors, e.g., Minister of Energy, the Premier, President and all other government officials.
- Wind energy development organizations: This refers to various organizations that seek to promote WED or companies engaging in the deployment of the technology.
- Experts: Experts include professionals both within academia and practice that engage in a field relating to WED, e.g., economists, engineers, engineering professors, biologist, political scientists and health experts. Based on the substantial level of influence that these individuals possess within society, we suggest coding their discourses as a separate stakeholder group.

Stakeholder groups could be modified based on the jurisdictional context of the study. Within this analytical strand, a unit of text will only qualify to be coded if it contains a perspective of a stakeholder highlighting a WED risk or benefit in the context of one of the six frames. Therefore each coded unit should contain a stakeholder, frame and frame inclination. A partial coding structure for this analysis is displayed in Figure 2.8. The nodes (i.e., categories for documenting coded contents) should contain each possible combination of a stakeholder, frame and frame inclination, resulting in a total of 60 possible combinations. After coding all combinations, the frequency of various combination can be graphed and used to draw certain preliminary conclusions; e.g., high frequencies of combinations ‘I4a’ and ‘G4a’ and ‘E4a’ within Figure 2.8 indicate the

likely existence of a consensus between individuals, government officials and experts concerning the risky nature of renewable energy policies. Following such preliminary interpretations, researchers should dig deeper to understand the context in which various discourse combinations occur. For example, this could provide insights into specific aspects of renewable energy policies individuals, government officials and experts consider risky. The major benefit of utilizing alphanumeric values to capture various discourse combinations rests in the fact that they allow for coherence in categorizing stakeholder perspectives.

Figure 2.8 Coding structure for capturing stakeholder perspectives within NVivo



Name	Sources	References
E1s	4	4
E2a	3	4
E3a	3	3
E4a	15	17
E4s	6	7
E6a	2	2
E6s	1	1
G1a	1	1
G1s	14	16
G2a	3	3
G2s	2	2
G3a	7	7
G4a	17	19
G4s	9	9
G6s	1	1
I1a	6	6
I1s	2	3
I2a	3	3
I2s	2	2
I3a	13	14
I3s	1	1
I4a	21	22
I4s	2	3
I5a	1	1
I5s	0	0
I6a	1	1
I6s	0	0
I7a	3	3

Note: Coding structure shown for a limited number of all 60 possible combinations of stakeholders, frames and frame inclinations

Utilizing this second strand of CA will help researchers tease out the most cherished values of multiple stakeholders as they pertain to WED. Additionally, points of

disagreement among multiple stakeholders involved in the WED and policy making process will be unearthed. Based on the broad range of issues which determine WED and policy outcomes, the findings of such a study could help advance WED policy by revealing key areas in which stakeholder conflict resolution should be sought.

2.5.3 Analytical Strand 3: Understanding risk-based social responses to WED

The third strand of content analysis is aimed at answering the following questions:

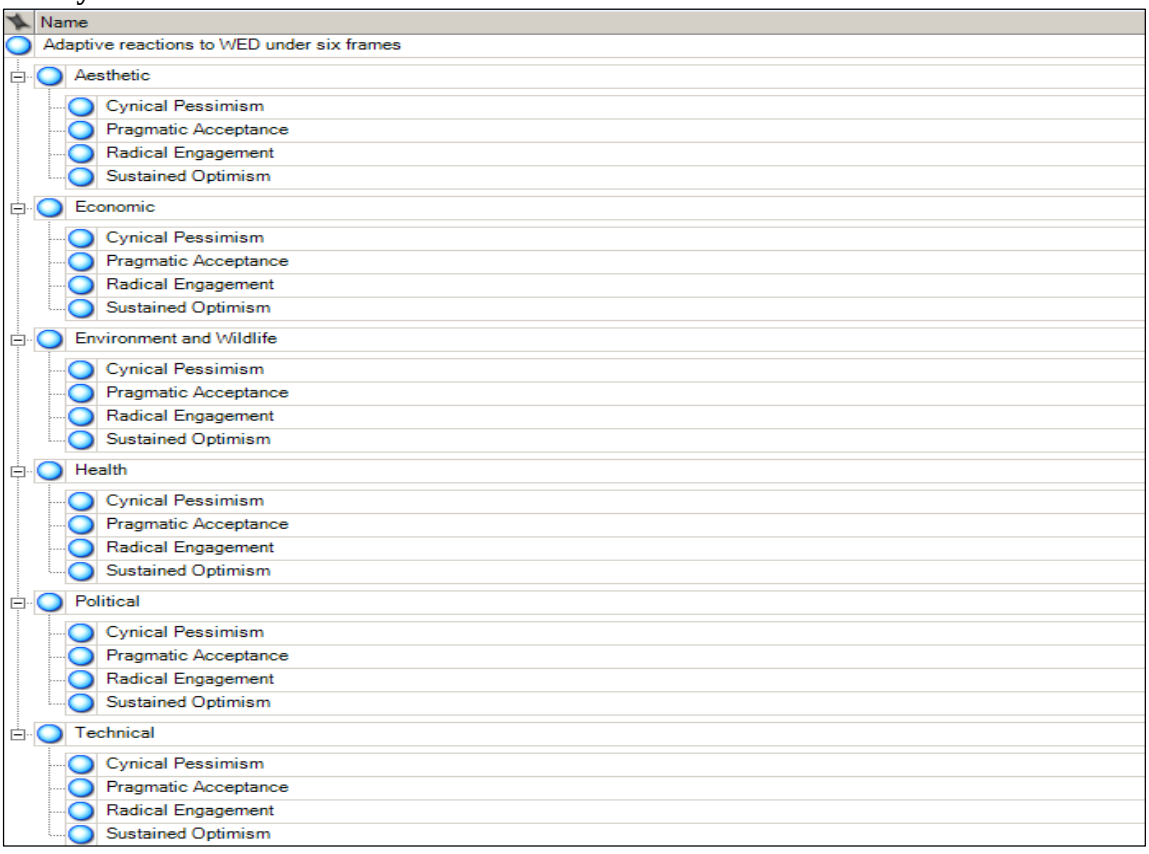
- What is the nature of public responses to WED based on perceptions associated with the technology?
- Which issues likely trigger the acceptance or rejection of WED within communities?
- How have public responses to WED evolved over time?
- How do public responses to WED vary over space (i.e., between different jurisdictions)?

Risk based studies of WED have generally focused on the nature of media coverage of wind energy health risks (Deignan *et al*, 2013) and public responses to WED based on health risks associated with the technology (Songsore & Buzzelli, 2014b). Since the media report actual events within the public sphere (e.g., protests), we suggest utilizing media contents to study occurrences on the ground. This could be achieved by employing risk based theories that explain different mechanisms through which societies respond to perceived risks. We suggest using risk frameworks to capture risk-based responses to WED across all six frames.

Risk theories that explain social responses to perceived risks (e.g., risk society theory and the cultural theory of risk) should be utilized for such studies. The risk society

framework will be used to provide a sample roadmap for utilizing this analytical strand. Under the framework, Beck(1992) and Giddens (1990) propose that the pervasiveness of modern risks has compromised society's trust in policy makers, science and technology, thereby generating four response mechanisms from societies: (1) radical engagement, which represents the contestation of institutions responsible for the deployment of perceived risks (2) pragmatic acceptance, which represents the decision to coexist with perceived risks despite recognizing their potential ramifications, (3) cynical pessimism, representing world weary responses to risks through the use of humor to ward away inherent concerns, (4) sustained optimism, implying maintained trust in science, technology and other institutions as long term solutions to perceived risks.

Figure 2.9 Coding structure for capturing social responses to WED using the risk society framework



In utilizing the risk society theory to understand public responses to WED on the ground, the analysis could be structured to capture the emergence of the four response mechanism within the context of each of the six frames. A sample of this coding structure is show in Figure 2.9. Within the figure, the four response mechanisms are placed under each of the six frames, making it possible to code each of the responses in relation to each of the six frames. The outcomes of the coding will reveal response mechanisms being adopted by individuals, communities and social movements who are either opposed to or supportive of WED based on risk associated with the technology. Findings will also reveal variations in risk based responses to WED across all six frames; hence, helping reveal which issues evoke the most radical responses to the technology and vice versa. While the effectiveness of this approach lies in its ability to reveal specific issues which evoke supportive or resistant responses to WED, certain key responses could be missed based on the mechanisms of framing adopted by the media.

To account for spatial or temporal variations when utilizing any of the three main roadmaps provided in this paper, media contents need to be imported and coded separately according to the study goals. If a study aims to understand variations in WED over time or space, articles published between the time periods or special units of interest should be imported separately into the analysis software. The coding should then be performed separately for each time period or spatial unit of interest. This will result in outcomes that could easily be compared to reveal spatial or temporal variations in WED.

By tying findings from the CA protocols outlined in this paper to existing policies and programs pertaining to WED within the jurisdiction(s) under investigation,

researchers could inform policies directly by unearthing potential roadblocks to stakeholder consensus and/or social acceptance.

2.6 Conclusions

This paper attempts to provide methodological guidelines for utilizing media content analysis to gain a holistic understand of WED and policy outcomes. While some of the applications of the methodology demonstrated in this paper have already been undertaken, there is no comprehensive guide that clearly spells out methodological guidelines for utilizing media CA to understand WED and policy outcomes. Where these methods have been employed, the primary focus has been on the implications of media coverage for WED and policy outcomes (e.g., Stephens *et al*, 2009; Songsore and Buzzelli, 2014a). Researchers have therefore paid little attention to systematically spelling out the methodological protocol in great detail. This could partly be due to word limits of various peer reviewed journals, which likely limit the amount of detail researchers can provide. This paper therefore places primary focus on providing detailed methodological roadmaps for utilizing CA to understand WED and policy outcomes.

The validity of analysis carried out using the three analytical strands discussed here could be enhanced by drawing from relevant external sources. Employing these approaches will firstly require in-depth review of literature on WED. Findings that emerge from employing the methodological roadmaps provided in this paper should be tied to existing literature to provide context and help interpret and understand the potential implications of the study findings. Peer reviewed studies carried out within the same jurisdictional context as the study jurisdiction could especially help to enhance the

validity of the media CA outcomes, i.e., if findings from WED studies correspond with outcomes from the media CA, the validity of the CA will be greatly enhanced.

Another important source which could be used to validate the media CA outcomes is websites of various interest groups such as wind energy development organizations, resistance groups and energy promotion organizations. The information which should be utilized within these sources will depend on the study outcomes and the issues requiring verification, e.g., where the study outcomes suggest increased intensity in resistance over time, researchers could refer to the websites of interest groups to document their growth or activity trends. Important details such as the growth in WED could also be verified from websites and used to understand the potential implication of the study outcomes for wind power growth trends.

Due to the ability of energy policies to impact issues pertaining to the six frames outlined in the paper, it is extremely important to keep the energy policies of the jurisdictions being studied in perspective regardless of the analytical strand being employed. By keeping policies in perspective throughout the research process, researchers could provide detailed insights on needed policy amendments or various potential flaws within existing policies. Keeping policies in perspective also helps strengthen the external validity of the media analysis by relating study findings to the main driver of energy deployment.

While a multiplicity of factors influence WED policy and outcomes, the majority of studies have tried to explain deployment by focusing on specific factors or a few factors that shape responses to the technology. The role of broader stakeholders who play

a role in determining the success of WED policies and outcomes has also received little attention. Additionally, the spatial and temporal scale of most existing WED studies has been limited. Building on Luhmann's (1989) theory of ecological communication (see Stephens *et al*, 2009), the SPEED framework (Stephens *et al*, 2008), which was developed to help researchers gain a more holistic understanding of energy deployment and political ecology theory, which highlights the importance of considering environmental issues on broader spatio-temporal scales, this paper provides a detailed methodological roadmap for utilizing media CA to gain a more holistic understanding of WED.

Figure 2.1 summarizes various themes and questions that could be addressed by using the methodological roadmaps provided in this paper. The application of the methodological roadmap provided in this paper could help researchers (1) understand public perceptions of WED, (2) unearth stakeholder conflicts that influence WED and policy outcomes and (3) gain an in-depth understanding on how certain risks associated with WED influence the way communities respond to the technology. If applied collectively, these three analytical approaches could help researchers gain a more holistic understanding of WED and policy outcomes.

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CHAPTER 3

WIND ENERGY DEVELOPMENT IN ONTARIO: KEY DISCOURSES IMPACTING SOCIAL ACCEPTANCE

3. Abstract

This study reports findings from a retrospective eight-year media content analysis of the nature and characteristics of discourses surrounding wind energy development (WED) in Ontario. The analysis is centered on Ontario's Green Energy and Green Economy Act, 2009 (GEA) which was enacted to speed up the growth of renewable energy technologies. Rooted in Luhmann's ecological communication theory, the study also draws on the media theories of agenda setting and framing to understand the potential impacts of media coverage on public perceptions. While health and economics emerged as the most salient issues surrounding WED, politics and environment and wildlife were of average salience. Aesthetics and technical issues were least salient. Amidst these trends, risk-based frames were generally more prominent than benefit-based frames, especially after the GEA was enacted. In comparison to the benefits of WED, the framing and legitimization of risks were also more thorough. The study suggests that public discourses around WED in Ontario are more likely to be dominated by negative rather than positive perspectives. The study problematizes the superficial nature of community engagement in WED, advocating for deeper project-specific engagement tailored towards minimizing negative impacts of projects on the cherished values of individual communities.

3.1 Introduction

Due to energy insecurity, climate change and other environmental concerns, several jurisdictions are gravitating towards renewable energy. Globally, this has resulted in the adoption of policies aimed at speeding up the growth of renewable energy technologies (Pazheri *et al*, 2014), among which wind energy is currently experiencing the fastest growth (Lee *et al*, 2014). Canada's installed wind energy capacity grew rapidly from 23 megawatts (MW) in 1997 to approximately 9,649MW in 2014 (Natural Resources Canada 2015; Canadian Wind Energy Association, 2015). The province of Ontario currently possesses the highest installed wind energy capacity in Canada (~3,489.4MW), accounting for as much as a third of Canada's total installed capacity (see. Figure 1.1 in Chapter 1). Under Ontario's Long-Term Energy Plan (2013), 10,700MW of renewable energy generation is expected by 2021. Wind energy would continue to experience substantial growth within the province under these plans.

A combination of vast wind resources and a strong policy environment account for Ontario's relative success in WED. According to Ontario Sustainable Energy Association (2005), southern Ontario alone possesses over 24,000MW of wind resources. A majority of Ontario's installed capacity was built after the implementation of the Green Energy and Green Economy Act, 2009 (henceforth, GEA). The policy was enacted with the aim of making Ontario a global leader in WED by streamlining the approval process to accelerate deployment (Deignan *et al*, 2013). The policy also resulted in massive financial investments such as the signing of a seven billion dollar contract with Samsung for the generation of renewable energy (Hamilton & Benzie, 2010). WED and the GEA in

particular have spurred controversies, evident in the emergence of numerous opposition groups in Ontario (see Baxter *et al*, 2013; Walker *et al*, 2014a; Songsore & Buzzelli, 2014a, 2014b).

In response to the aforementioned global trends in WED, social science literature on the social aspects of the technology has grown substantially. Yet although the research record has grown, its coverage is uneven. The research is dominated by community case studies which focus on how specific factors or a few factors shape social responses to the technology; hence, little is known about the communication of risks and benefits associated with the technology to host communities as well as the role played by multiple factors in shaping deployment and policy outcomes (e.g., Stephens *et al*, 2009; Songsore and Buzzelli, 2014a). Based on rapidly growing WED, a radical policy environment and growing conflicts around WED in Ontario, the current study is a longitudinal content analysis of local Ontario newspapers to: (1) understand how risks and benefits pertaining to different implications of WED (i.e., health, environment & wildlife, aesthetics, technical, political and economic factors) are framed and legitimized, (2) understand variations in salience given to different aspects of WED, (3) examine temporal variations in the communication of WED risks and benefits with respect to Ontario's GEA and (4) explain the potential implications of media coverage for public perceptions of WED in Ontario.

3.2 Overview of Literature

Based on past and ongoing research, we know that the social acceptance of WED depends on wide-ranging factors which include economics (Cowell *et al*, 2012,

2011; Munday *et al*, 2011; Walker *et al*, 2014b), health (Walker *et al*, 2014; Shepherd *et al*, 2011), politics and planning (Friebe *et al*, 2014; Gross, 2007; Enzensberger *et al*, 2002; Szarka, 2006; Wolsink, 2000; Jobert *et al*, 2007; Strachan and Lal, 2004), aesthetics (Thayer & Freeman, 1987; Johansson and Laike, 2007; Bishop & Miller, 2007; Pasqualetti, 2000; Brisman, 2005), environment & wildlife (Aitken, McDonald, & Strachan, 2008; Warren & Birnie, 2009, Warren *et al*, 2005; Kuvlesky, 2007; Pruett *et al*, 2009; Kunz *et al*, 2007) and technical factors (Sovacool, 2009; Georgilakis, 2008). Findings from the aforementioned clusters of literature suggest that variations in socio-political contexts account for variations in the key determinants of social responses to WED, e.g., while some studies within the European context suggest that aesthetics best predicts social responses (e.g., Wolsink, 2000 & Devine-Wright, 2005), this notion varies from some studies in the North American context which suggest that community benefits and perceptions of health risks best predict the social acceptance of WED (e.g., Baxter *et al*, 2013).

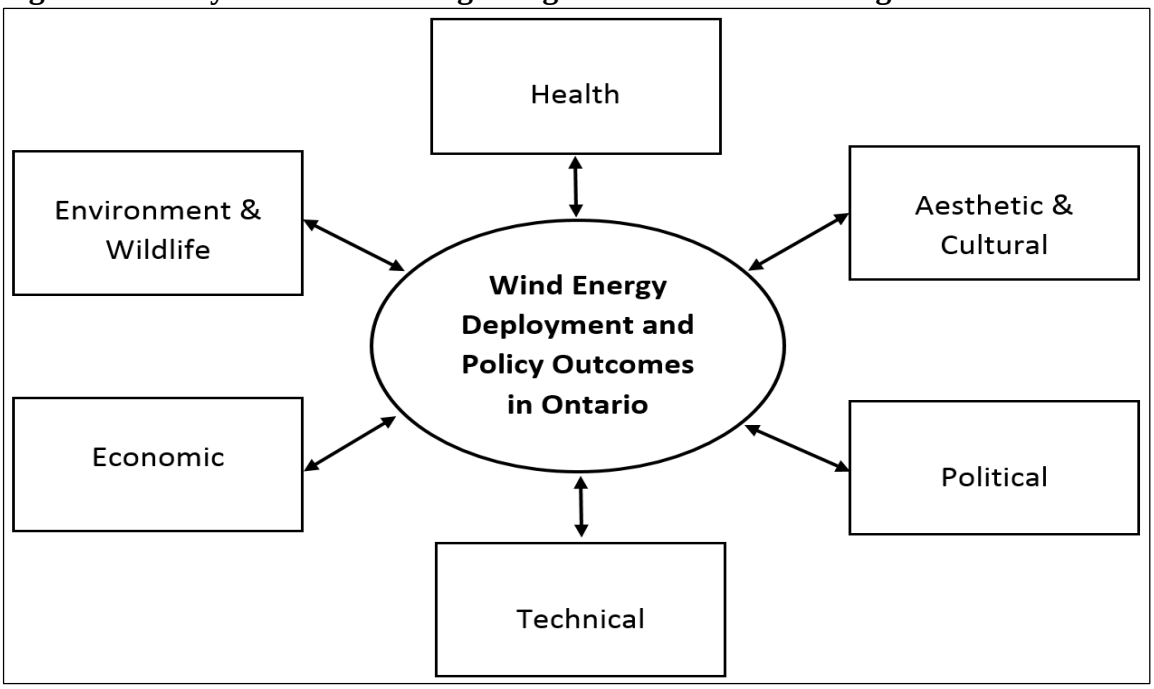
Another common characteristic of much of the research to date is their design and orientation. They are often community case studies focusing on specific issues or a few issues deemed as important determinants of social responses to WED. Though these studies deepen our understanding of the role of specific issues in shaping social responses to WED on a community scale (e.g., economic benefits, health risk perceptions, aesthetic concerns), the bigger picture remains missing. Firstly, the focus on the community scale does not provide insights on how WED plays out over larger spatial scales (e.g., provincially, nationally and internationally). Secondly, the narrow topical focus results in the absence of a more holistic picture of how multiple factors, their interplay, and

variations in salience shape social responses. The temporal evolution of social responses to WED also tends to be missing in these studies.

The complex and multifaceted nature of WED justifies the need for theoretical frameworks that can help provide more holistic insights by unravelling ways in which multiple factors and the interplay thereof shape social responses. In a study of WED in Saskatchewan, Canada, Richards *et al* (2012; 691) concluded by arguing for multi-dimensional approaches to understanding renewable energy development, claiming that "renewable energy cannot be explained solely by technological, social, political, or economic factors in isolation". Driven by this need, this study contributes to limited and newly emerging literature seeking to understand WED and policy outcomes through a more holistic and multidimensional lens (e.g., Stephens *et al*, 2009; Bidwell, 2013, Songsore and Buzzelli, 2014a).

Figure 3.1 displays the analytical structure that is used to frame the approach to WED in the current study. The figure displays major determinants of the success or failure of developments (e.g., health, aesthetics, economic factors, etc.).

Figure 3.1 Analytical structure of gaining a holistic understanding of WED in Ontario



As evidenced in the existing literature, each of these factors may also have varying impacts on the way communities perceive and/or respond to proposed developments. This study aims to unearth these variations. By conducting a province-wide study in the context of Ontario, this study complements existing literature which tends to be community case study based by providing insights on a broader spatial scale. The study also complements existing studies which generally do not account for the temporal evolution of social responses by conducting a retrospective analysis of WED discourse in Ontario over an eight-year period, in the middle of which we saw the introduction of significant legislation (i.e., Ontario's GEA).

3.3 Study Design and Justification

By proposing a structure for documenting and understanding debates surrounding environmental problems, Luhmann's (1989) theory of ecological communication

provides a foundation for uncovering the multiplicity of factors that shape WED and policy outcomes. According to Luhmann, the functional subsystems that make up industrial societies serve as a mechanism through which potential responses to the environment are framed. Communication among the crucial functions of the subsystem (i.e., economy, law, science, religion, politics and education) then represents the means through which societies respond to environmental disruptions. This study draws two key foundational insights from Luhmann's ecological communication framework, which are that social responses to WED could potentially be categorized into 'mutually exclusive' and nonetheless 'interacting' frames/issues. Building on Luhmann's theory, Stephens, Rand and Melnick (2009) in a study of state-level variations in public discourses on wind technology within three US states identified six mutually exclusive frames (political, environment & wildlife, health, aesthetics, technical and economic) which are at the core of WED. These frames reflect key themes in existing and growing literature on the social aspects of wind power, and are used to structure and analyse media discourses on WED in Ontario within the current study.

There have been recent calls for more integrated and holistic inquiries into WED (Richards *et al*, 2012). Stephens *et al* (2008) developed the socio-political evaluation of energy deployment (henceforth, SPEED) framework, which stresses the central role of public discourse in influencing the success of renewable energy development. The framework recognizes media analysis as an effective mechanism for understanding public perceptions of energy deployment and consequently, deployment patterns on the ground. SPEED also stresses the integrated nature of various factors that shape energy deployment decisions. The framework will be adopted within this study by utilizing an

integrated lens to understand WED discourses within the media and consequently, the nature of public perceptions on the ground. Thus, while paying attention to the workings of individual frames, the study also pays attention to how the interplay of multiple frames impact WED.

While the mass media has been shown to have varying impacts on public perception (Scheufele & Tewksbury, 2007; Forrest & Marks, 1999), some argue more strongly that media coverage reflects public discourse (e.g., Gamson and Modiglani, 1989; McCombs & Shaw, 1972). Media effects take place through two major mechanisms: (1) agenda setting, which refers to the ability of the media to influence public perceptions about issue salience (McCombs, 2013) and (2) framing, which involves the media "highlighting some aspects of reality while excluding other elements, which might lead individuals to interpret issues differently" (Borah, 2011; 248).

Through agenda setting the media tells us 'what' to think about (Perse, 2001; 26) by giving different issues disparate frequencies of coverage (Weaver *et al*, 2004; Wanta & Ghanem, 2007). The agenda setting theory suggests the existence of a direct relationship between frequency of coverage and issue salience (i.e., the perceived importance of issues) (McCombs & Shaw, 1972). In the current study, we utilize agenda setting to uncover the salience of risks and benefits associated with WED under the six frames by assessing the frequency of media coverage across all frames. Framing is an extension of agenda setting that concerns itself with the ability of the mass media to tell people 'how' to think about issues (Scheufele and Tewksbury, 2007). Through framing, the media affect the perspectives of readers. In contrast to agenda setting, framing

highlights salience through communicating texts in ways that "promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described" (Entman, 1993; 52). Through the lens of framing, this study will analyse specific topics used to define WED risks and benefits under each of the six frames.

Based on the relative novelty of WED in Ontario and the complexity of conflicts surrounding the technology, the current study also pays attention to the mechanisms of legitimation employed in framing the merits and demerits of WED. Specific focus is placed on the use of normalization and authorization to frame risks and benefits under the six frames. Normalization "seeks to render something legitimate by exemplarity" (Vaara *et al*, 2006), while authorization, refers to legitimizations through reference to authority (e.g., expert opinions and perspectives) (Van Leuwen, 2007). Through normalization, the framing of various risks and benefits could be made tangible through the use of concrete examples, e.g., in claiming that wind turbines have positive or negative economic impacts, frames that provide concrete instances which demonstrate the occurrence of these outcomes are more likely to make a more effective case. WED is also riddled with various complexities and controversies, e.g., conflicting accounts of the economic and health effects. Through authorization, the voices of various health (e.g., doctors and epidemiologist) and economic experts (e.g., realtors, financial analysts, economists) could for instance be used to either legitimize or delegitimize various health and economic risks or benefits associated with the technology; hence, adding credibility to various risk and benefit claims.

3.4 Methodology

This section outlines various methodological approaches which were employed in the study. It also details the rationale for using specific newspapers sources, the newspaper sampling and retrieval process, and various details pertaining to the qualitative content analysis and thematization approaches which were utilized.

3.4.1 Newspaper sampling

The deployment of wind power in Ontario is concentrated in rural parts of the province. Hence, local newspapers circulated within municipalities hosting projects were utilized for the analysis. While recognizing that communities may be obtaining their information form a diversity of print and digital media sources circulated nationally and internationally, a benefit to utilizing local newspapers is that they can present more accurate reflections of the perspectives of local residents (Morrone *et al*, 2012). As a first step in the sampling, all existing WED projects in Ontario (N= ~41) and their respective locations (N=~23) were identified from the website of Ontario's Ministry of Environment (available at http://www.ontario.ca/environment-and-energy/renewable-energy-projects-listing?drpType=Wind&drpStatus=Approved&drpLocation=0). Since the aim of the study is to provide insights pertaining to the province of Ontario, a preliminary decision was made to utilize local newspapers circulated in all 23 communities. Due to large sample sizes, newspapers had to be digitally accessible (i.e., available on computer databases) in order to be utilized. Articles were therefore sampled from all local newspapers which were accessible via computer databases (N= 13). Newspapers were sampled from the LexisNexis database. With the exception of the Orangeville Banner, all

other articles were sampled from newspapers owned by Sun Media Corporation. This was due to accessibility limitations. Hence, the newspapers analysed in this study are not necessarily reflective of all newspapers circulated within turbine hosting communities.

The next stage of the methodological protocol involved selecting a date range for the study. Since the aim of the study was to understand temporal variations in media discourse before and after the GEA, preliminary searches were conducted for all 13 newspapers to assess database availability between January 2000 and June 2013 (the month of the search). The preliminary database search revealed database inconsistencies prior to 2005, e.g., the unavailability of certain newspaper articles. Hence, articles published over an eight year period (2005-2013) were sampled for analysis. Articles were downloaded into two broad clusters: (1) articles published 4 years before the GEA (January 1, 2005-January 31, 2009) and (2) articles published 4 years after the GEA (May 14, 2009- June 13, 2013). A detailed summary of the sampling procedure is displayed in Figure 3.2, while the newspaper sources and the frequency of articles which were published and downloaded from each newspaper are displayed in Figure 3.3.

Based on the sampling protocol in Figure 3.2, a total of 840 and 1,526 articles were retrieved for the pre- and post-GEA time frames respectively. With the exception of the St. Catharines Standard and the Sault Star which had slightly more articles published before the GEA, all other newspapers experienced a substantially higher frequency of articles after the GEA (see. Figure 3.3). This tentatively suggests that WED became more newsworthy and salient after the GEA was implemented.

Figure 3.2 Sampling procedure

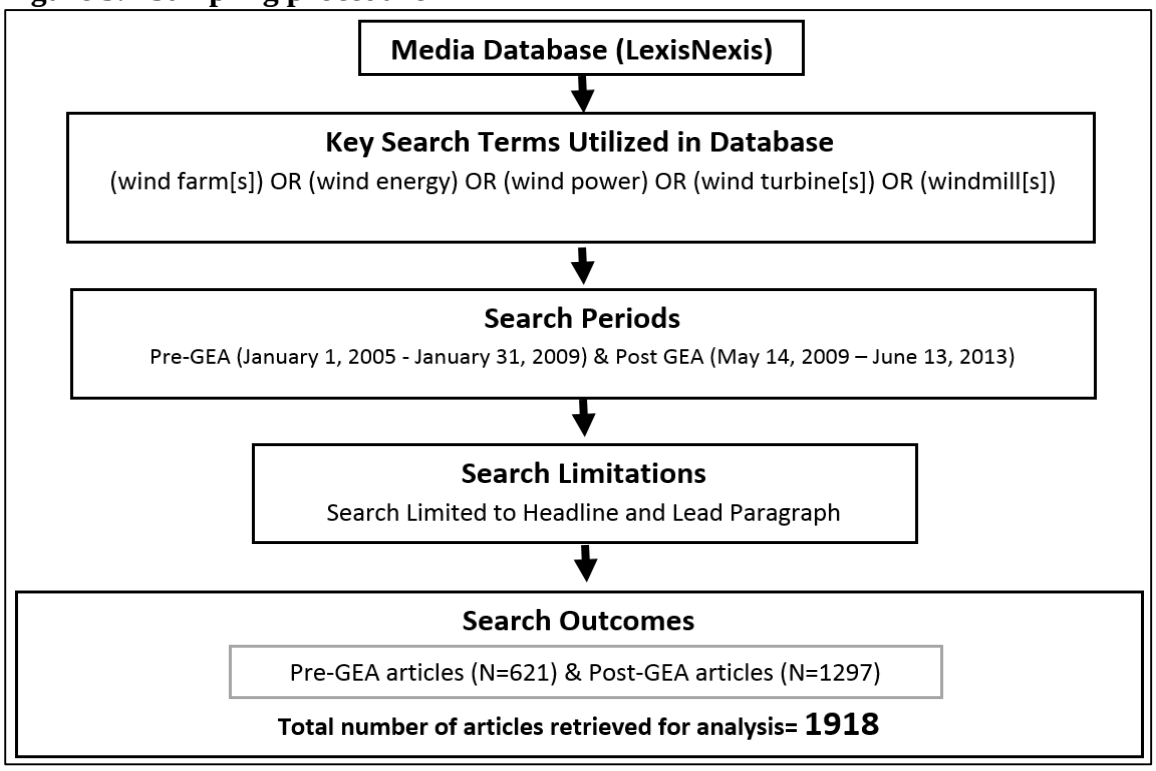
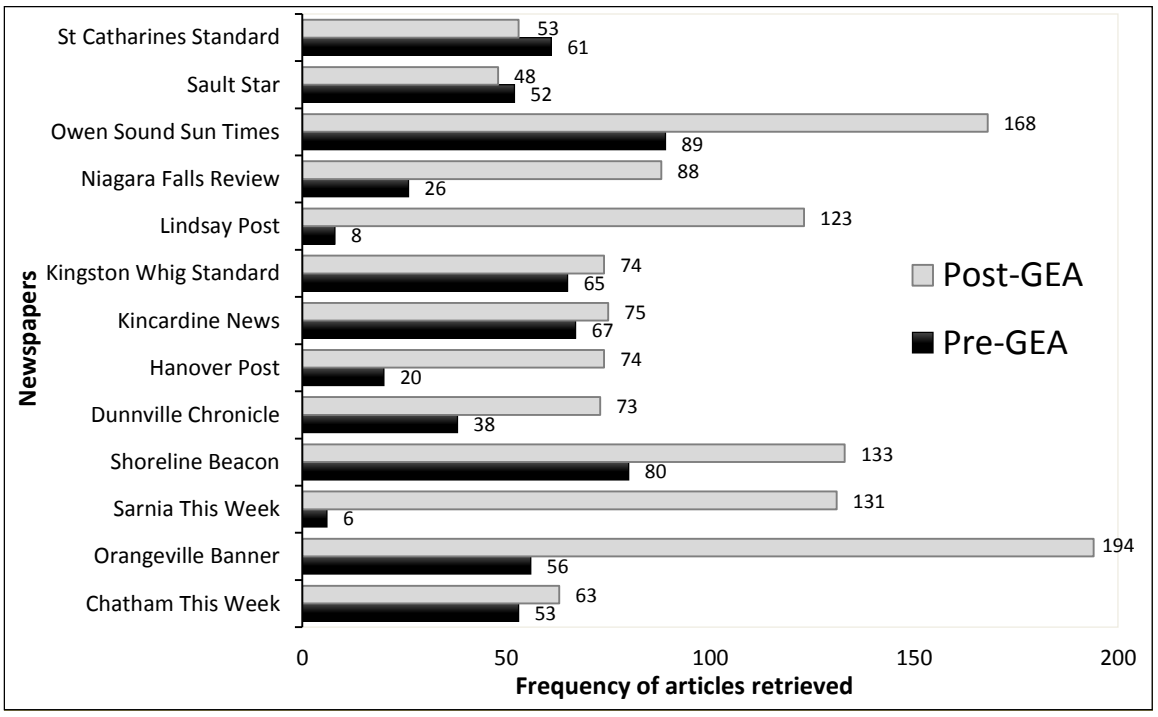


Figure 3.3 Frequency of articles sampled from individual newspapers pre- and post-GEA



3.4.2 Data Analysis

Based on the large volume of articles and the need for a rigorous data reduction and analysis technique, qualitative content analysis was utilized. Patton (2002, p.453) defines qualitative CA as "a qualitative data reduction and sense making effort that takes a volume of qualitative material and attempts to identify core and consistent meanings". The strength of content analysis lies in its core requirements of systematization, objectivity and reliability (Riffe *et al*, 1998; Krippendorff, 2004; Neuendorf, 2002). Objectivity highlights the importance of avoiding arbitrary analysis by following "explicitly formulated rules and procedures" (Holsti, 1969, p.3), while systematization implies following a "step by step protocol" (Riffe *et al*, 1998). Within this study, these requirements were satisfied by formulating explicit rules for sampling (e.g., local newspaper & newspapers containing certain key words). The coding process also entailed strict adherence to instructions formulated within the analytical codebook. Reliability according to Weber (1990) is concerned with the validity of inferences from texts and the consistency of text classification. To enhance rigor, the CA methodology requires that multiple texts be categorized in the same manner by multiple coders (Krippendorff, 2004). To ensure that study findings were reliable, intercoder reliability tests were performed to help establish consistency in the coding of articles.

Prior to the coding, an analytical codebook was formulated to guide the analysis. The purpose of a codebook is to "explicitly define and describe all variables to be collected for analysis" (Haldford, 2008, p.177). The analytical codebook provided a detailed definition of contents that should be coded as risks or benefits under each of the

six theoretical frames (see Appendix A). An intercoder reliability test was then performed between the primary researcher and an upper year PhD student to assess the consistency of coder decisions (see Mondello & Pedersen, 2003). Prior to the test, a training session was held to explain the study rationale and analytical codebook to the secondary coder, after which a few articles were collectively coded and discussed. Following the training, a sample of 50 articles were independently coded by both researchers. After the coding, a Scott's Pi ($1 \geq \pi \geq 0$) test was performed to assess the level of intercoder reliability. In general, a Scott's Pi value of 0.45 or greater suggests the existence of an acceptable level of intercoder reliability (Scott, 1955; see Riffe *et al* (1998) for a more recent discussion). Scott's Pi values obtained from the reliability tests ranged between 0.84 and 0.66, representing satisfactory levels of reliability (see Table 3.1). All articles were then imported into NVivo 10 and analysed by the primary researcher.

Table 3.1 Intercoder reliability test scores (Scott's Pi values)

Frame	Scott's Pi value
Economic	0.84
Environment & Wildlife	0.76
Political	0.66
Health	0.83
Aesthetic & Cultural	0.82
Technical	0.75

The qualitative content analysis in NVivo resulted in a total of 2,954 coded risks and benefits under all six frames, providing a snapshot of varying levels of prominence (salience) given to various frames within the media. To facilitate more in-depth analysis of the nature of the media discourse, thematic analysis was performed to categorize items

under each risk and benefit frame into a few coherent themes. Thematic analysis in this context refers to the identification of common themes and patterns (Vaismoradi *et al*, 2013; Aronson, 1994). In contrast to the qualitative content analysis, an inductive approach was utilized. Through the thematic analysis, risks and benefits coded under all six frames were categorized into few themes; i.e., while 75 instances were originally coded under the pre-GEA technical risk frame, the thematic analysis captured these coded instances under four broad themes: namely, generation problems, grid integration problems, repairs and installation challenges, and energy storage problems. Through the thematic analysis, all 2,954 instances of reported risks and benefits coded under the six frames were placed under 43 broad themes. More in-depth analysis was then conducted to understand framing and the use of authorization and normalization to legitimize various risks and benefits under all six frames.

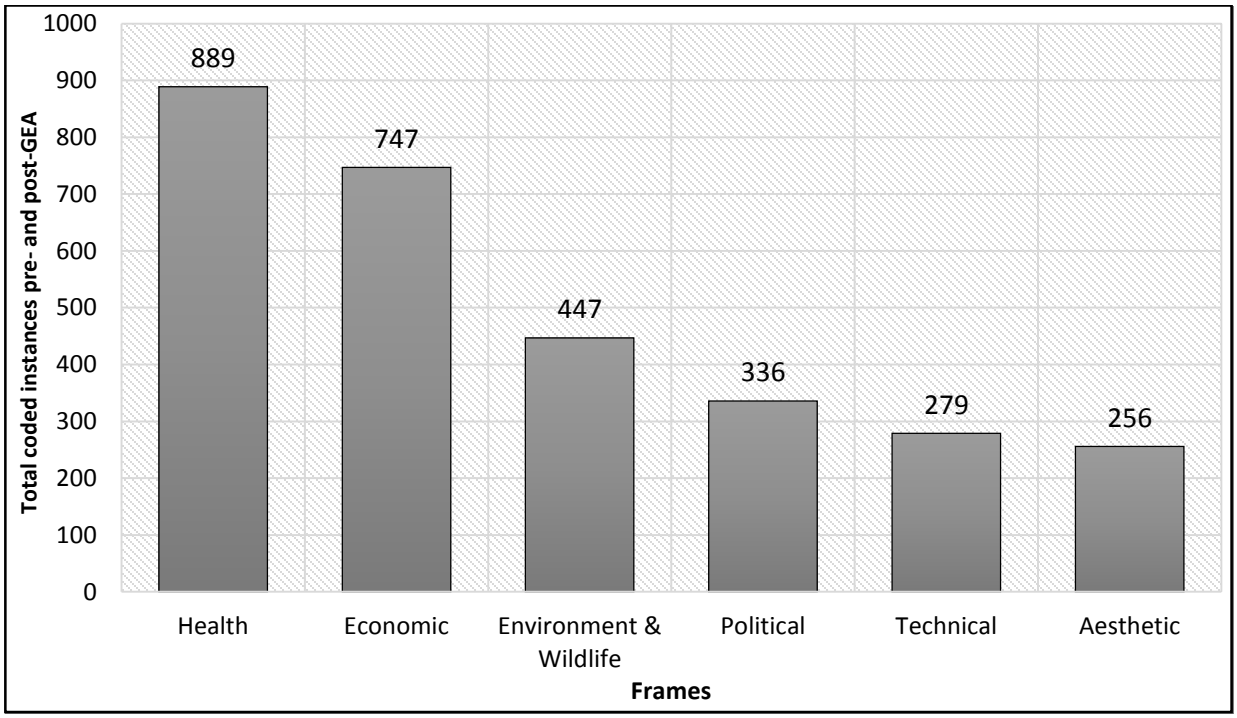
3.5 Results

The results are presented within two main sections. The first section provides snapshots of reported risks and benefits which were coded under each of the six frames before and after the GEA. Based on the agenda setting theory, the relative salience of each of the six frames is then discussed. The second section delves more deeply into the framing of WED risks and benefits. It focuses on specific themes which form the bulk of media reporting under each of the six frames, providing details on the use of normalization and authorization as strategies for legitimizing various risks and benefits.

3.5.1 Salience of risks and benefits under six frames

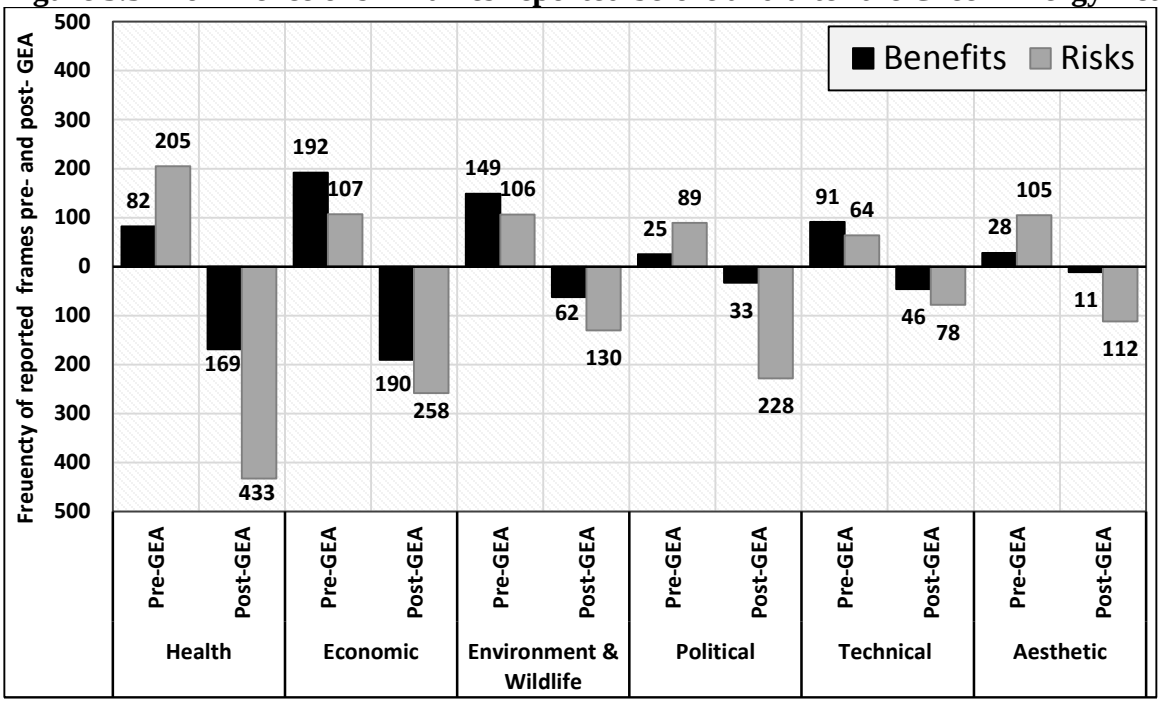
Figure 3.4 shows the frequency of reported risks and benefits coded pre- and post-GEA under each of the six frames, while Figure 3.5 shows the relative prominence of WED risks and benefits which were coded under each of the six frames before and after the enactment of the GEA. In descending order, the amalgamation of all reported risks and benefits coded under the six frames pre- and post-GEA suggest that health and economics are by far the most salient issues within WED discourses in Ontario, while environment & wildlife and political issues are of average salience. Technical and aesthetic factors on the other hand seem least salient relative to the aforementioned frames (see Figure 3.4 for total coded instances and Figure 3.5 for a breakdown of risks and benefits coded pre- and post-GEA).

Figure 3.4 Total coded reported instances of risks and benefits under six frames Pre- and Post-GEA



Totals (per frame) = Pre-GEA (risks and benefits) + Post (risks and benefits)

Figure 3.5 Prominence of six frames reported before and after the Green Energy Act

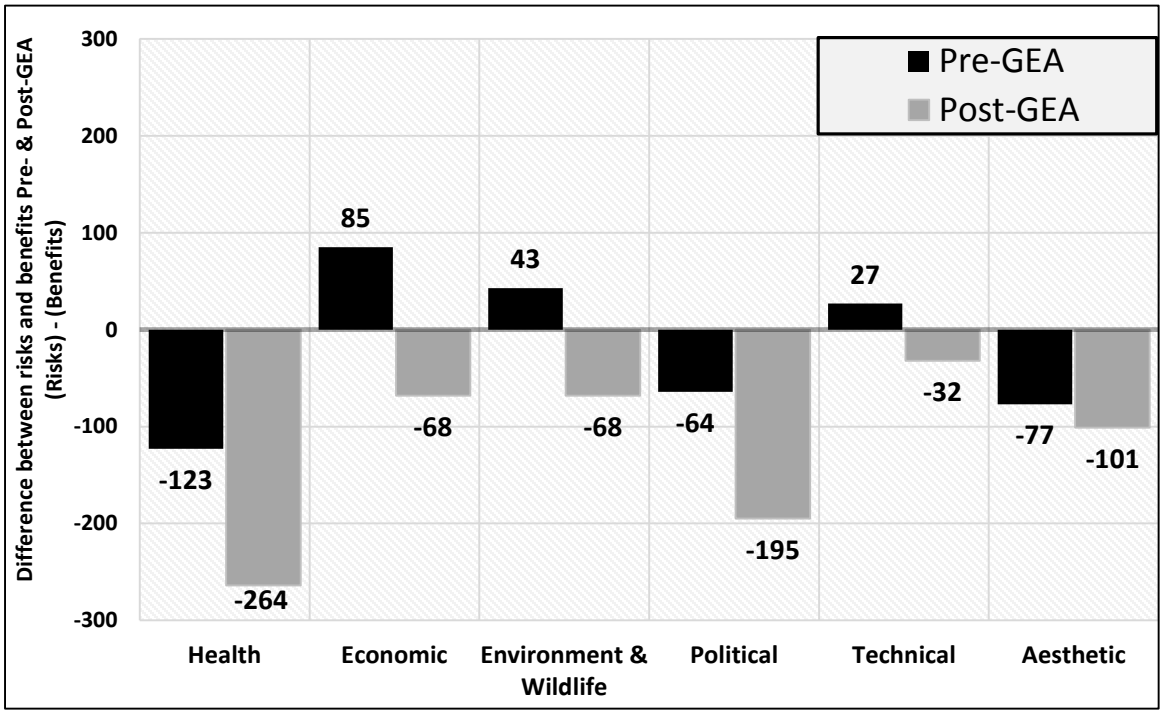


Pre- and Post-GEA values are located above and below the X axis respectively.

Figure 3.6 on the other hand shows variations between reported risks and benefits (i.e., Risks minus Benefits) within each frame and time period (i.e., pre and post-GEA). Within the figure, negative values depict the extent to which reported risks outweighed benefits, while positive values show the extent to which reported benefits outweighed risks. While there were instances where reported benefits outweighed risks before the GEA (i.e., under the economic, environment & wildlife and technical frames), reported risks under each of the six frames outweighed benefits after the policy was enacted. Where reported risks outweighed benefits both pre- and post-GEA under specific frames (e.g., see political and health frames in Figure 3.5), post-GEA levels were appreciably higher. On the whole, the trends in Figures 3.5 and 3.6 show that the prominence of reported risks far outweighed benefits under all six frames following the enactment of the GEA. Generally, this suggests

that risks associated with WED became more salient within public discourse after the GEA was passed into law.

Figure 3.6 Difference between reported risks and benefits pre- and post GEA for each frame



Positive values (values above the X-axis) show the extent to which benefits outweigh risks, while negative values (values below the X-axis) show the extent to which risks outweigh benefits.

3.5.2 Framing of WED risks and benefits

This section details the dominant mechanisms of framing which were used to present risks and benefits under each of the six frames. In addition to providing details of the core themes which emerged under risk and benefit frames, the legitimation strategies employed (i.e., authorization and normalization) within media reports are presented in detail. In cases where these legitimation strategies are not utilized, key emerging risks and benefits are presented. Since most risk and benefit frames are in direct contrast, the results

are organized to reflect these contrasts. Finally, attention is paid to temporal changes in the framing and legitimation of various risks and benefits with respect to Ontario's GEA.

3.5.2.1 Health frame

While the health benefit frame was the fourth and second most prominent reported frame among all benefit frames before and after the GEA respectively, the health risk frame before and after the GEA was more prominent than any other reported risk or benefit frame within both respective time periods (See Figure 3.5). The prominence of health risks far exceeded health benefits before and after the GEA. Noticeably, the post-GEA health risk frame was by far the most prominent frame coded before and after the GEA. While these trends suggest that health risks were by far more salient than health benefits within public WED discourse in Ontario pre- and post-GEA, they further suggest that health risks became a lot more salient after the GEA. Health benefit discourses before and after the GEA portrayed the technology as clean, safe and devoid of negative health effects, while health risk frames attributed various negative health impacts such as noise, vibrations, shadow flicker and ice throws to the technology.

The framing of health benefits before and after the GEA was similar in nature and characteristics, focusing on the clean and safe nature of WED. Claims by the scientific community in Ontario and Canada were used to legitimate these health benefits. These claims often justified WED as a health asset by highlighting health risks associated with other energy generation technologies (e.g., emissions from coal generation). This is exemplified in this instance where the voice of the Canadian Medical Association was drawn upon to legitimize health benefits: "The Canadian Medical Association estimated

that in 2008 Canada's air pollution was responsible for 21,000 premature deaths, 92,000 emergency room visits and 620,000 visits to a doctor's office" (Suzuki, 2013). A dominant voice within these legitimations was that of the Chief Medical Officer of Ontario (Dr. David Colby), who was cited within several articles (i.e., ~60 times pre- and post-GEA). In one instance, for example, Dr. Colby was quoted as claiming that "Coal plants kill 250 people per year in Ontario and sicken thousands" (Robinet, 2011), while also claiming in another instance that out of 68,000 wind turbines installed over the last 25 years, "there are no injuries documented in Ontario" (Cleeve, 2008).

Within the framing of health benefits, media discourses also drew on health expert voices within Ontario to legitimize the idea that wind turbines were safe, e.g., Dr. Loren Knopper, an environment and health scientist based in Ontario was cited as follows: "The overwhelming state of evidence and findings from government agencies around the world is, when sited properly, wind turbines will not be related to adverse health effects" (Tremblay, 2012). Similarly, Dr. Colby was said to have claimed that if Ministry of Environment guidelines for siting turbines are followed "there will be negligible adverse health impacts (from wind turbines) on Chatham-Kent residents" (Robinet, 2008; Story, 2009). A final mechanism which was used to legitimate the health benefits of WED was the citing of reviews to justify the absence of negative health impacts from wind turbines. An expert panel review sponsored by the Canadian and American wind Energy Associations and an expert panel review conducted be Massachusetts Department of Environmental Protection were both cited as evidence of the safety of turbines (Suzuki, 2013). In the case of the latter, it was stated that the review "found no scientific evidence

to support….harm blamed on wind power such as pain and stiffness….tinnitus, hearing impairment, cardiovascular disease and headache/migraine" (Suzuki, 2013).

Health risks-based discourses before and after the GEA associated various negative health impacts (e.g., headaches, ringing ears, tinnitus, etc.) with wind turbines, while providing details on the mechanisms by which turbines negatively impact human health (e.g., noise emissions, vibrations and shadow flicker). In contrast to the framing of health benefits, the strategies used to legitimate health risk claims were diverse, including experiences of individuals who claimed to experience health problems from turbines, the voices of health expert around the world and both peer and none peer-reviewed research. Wind turbine health risks before and after the GEA were legitimized using the voices of various Ontarians who claimed to be experiencing negative health effects. For example, within a media report that claimed turbines were harmful, a resident was reported to wake up with "a headache, muscle pain and a ringing in her ears" (Vivian, 2009) every time turbines run. Similarly, another resident claimed to be struggling from "headaches, sleeping problems and sometimes nausea" (Andrews, 2011) due to the presence of turbines. Some families were reported to have abandoned their homes due to these negative health impacts (see Keller, 2006; Keller, 2007).

Similar to the framing of health benefits, the voices of various Ontario-based health experts were used to legitimize health risks before and after the GEA, e.g., an Ontario based doctors' (Dr. Robert McMurtry) claims that some people in Ontario were suffering from wind turbine health effects was used on several occasions to legitimate health risks (Artuso, 2009). Unique to the health risk frame, voices of medical experts from all over the world

were also employed in the legitimation of wind turbine health effects. This became more prevalent after the GEA was implemented. Dr. Nina Pierpont, a N.Y based doctor for instance was reported to have claimed that turbines were generating negative health impacts in various jurisdictions. These impacts included "headaches, ringing in the ears, dizziness, nausea, rapid heart rate, irritability and problems with concentration and memory" (Sher, 2010).

Unlike health benefits which were only legitimized via reports, health risks were legitimized via international peer and non-peer reviewed research. A peer reviewed study published in the journal of Noise and Health was for instance claimed to have linked "industrial wind turbine noise and vibration to serious health problems" (Goldstein, 2012), while a World Health Organization's peer review summary was claimed to have stated that sleep deprivation from WED could result in health impacts such as "poor work performance, memory disturbances…." (Desrocher, 2011). In an article which suggested that wind turbines caused health problems, the conclusions of a study by three health experts in the United States, Canada and the UK were cited as follows:

> ….we conclude that the noise emissions of iWts (industrial wind turbines) disturbed the sleep and caused daytime sleepiness and impaired mental health in residents living within 1.4 km of the two iWt installations studied. Industrial wind turbine noise is a further source of environmental noise, with the potential to harm human health (Goldstein, 2012).

In this case, the study was also used to challenge legislation permitting setbacks of 550m in Ontario. Similar to the quote above which challenged legislation in Ontario, several health risks-based discourses after the GEA highlighted various injustices in Ontario's GEA. For example, such discourses alluded to the "disregard for public health

concerns" by the government of Ontario (Golem, 2009) and the government of Ontario's neglect of "health complaints of rural Ontarians regarding industrial wind turbines" (Goldstein, 2012). The following quote from Dr. McMurty who claimed turbines were causing health problems demonstrates claims of injustices which were intertwined with the health risk-based discourse post-GEA:

> I know people are suffering. There is something seriously wrong when our provincial government, who we elect to govern the people, doesn't stand up for us and instead stands up for big business (Day, 2012).

Based on the mechanisms of framing and legitimation used to present health risks and benefits associated with WED, the media discourse provides several reasons to believe that turbines have more negative than positive health impacts. While expert voices and reports written within Ontario were used as dominant mechanisms for legitimating health benefits, these sources were drawn from Ontario and abroad within risk frames. While the former tells a story that health problems are non-existent only within Ontario, the latter tells a bigger story by making the case that health problems exist in Ontario and abroad. While concrete examples of individuals safely coexisting with turbines were absent within the framing of health benefits, the health risk frame provided several concrete examples of individuals having turbine-induced health problems. This adds great value to the health risk frame by creating a tangible impression about the existence of health risks from turbines.

While the legitimation mechanisms employed in the framing of benefits were similar before and after the GEA, there were some unique differences in mechanisms utilized within the risk frame within both time periods. The use of various peer reviewed sources only occurred within the health risk frame after the GEA was enacted. This

mechanism of legitimation deepened the health risk discourse by painting the picture that the scientific research community around the world had determined that turbines were harmful. Another noticeable thread which was unique to the post-GEA health risk frame was the interlacing of discourses concerning injustices in Ontario's energy policies with health risk-based discourses. Since most of these discourses were directed to various tenets of the GEA, it strongly suggests that the GEA triggered more negative health-based perceptions of WED. With health risks being the most prominent frame coded before and after the GEA respectively and health risks far outweighing health benefits within both time periods, health concerns are likely the most salient factor shaping social responses to WED in Ontario. This assertion is not only based on agenda setting, but also the fact that the framing and legitimation of health risks were more robust and holistic in comparison to health benefits.

3.5.2.2 Economic Frame

Economic risks and benefits were consistently among the top two most prominent reported frames before and after the GEA respectively. The frequency of reported economic benefits exceeded economic risks before the GEA; however, this trend was reversed after the policy was implemented. While these trends generally suggest that economics is very critical within public WED discourse in Ontario, they further suggest that the economic implications of WED were more positive within public discourses prior to the GEA. Within both time periods, the dominant risks which emerged included property value declines, the high cost of wind power, job losses and the idea that WED was a disinvestment. Pre- and post-GEA economic benefit discourses on the other hand focused on job creation from WED, the cheap and cost effective nature of WED, the absence of negative property value

impacts as well as the potential of wind to generate revenue for individuals, municipalities and government.

The implications economic benefits from WED for government was at the core of economic benefit frames before and after the GEA. Within these periods, the potential of WED to generate revenue and savings for Ontario was one of the key recurrent themes. Success stories from other jurisdictions were used to legitimize these claims, e.g., pre-GEA, Denmark was said to be saving $167million off their national electricity bills in 2005 due to WED (Spotton, 2007), while post-GEA, France was slated to attract $4.5 billion in energy developments (Macleod, 2013). Unique to the post-GEA period, Canadian-based studies were also used to legitimize the potential of WED to generate financial savings for government. A study by Pembina Institute was cited for claiming that $300million was spent on mitigating health impacts from coal generation in Alberta; hence, making a case for WED (Suzuki, 2013). Similar to the aforementioned economic benefit discourses, the framing of government-focused economic risks were legitimized via experiences from other jurisdictions. Pre-GEA, Ireland, Norway, Denmark and Germany were said to have been selling their wind power to other countries at reduced rates due to intermittency and variability associated with the technology (Sellery, 2006), while it was stated that Britain's electricity regulator wanted to scrap WED due to billions of costs and small and expensive emissions savings (Mattmer, 2007). After the GEA, several European countries were also cited as accruing economic costs due to WED (e.g., Stella, 2009; Gerrie, 2012; Travis, 2011). These legitimations were deepened with evidence of economic losses from WED in Ontario, e.g., after the GEA, Ontario was said to be selling "excess electricity to neighboring jurisdictions such as New York State…and sometimes paying "either Quebec

or New York to take its excess electricity" (Epp, 2013). Unique to the post-GEA period, information from reports were also used to legitimize financial losses due to WED. For example, a report authored by McKirick which stated that Ontario had lost $2 billion due to wind exported at a loss was cited to legitimize economic risks. Data from the Independent Electricity System Operator was also claimed to show "Ontario now loses, on average, $24,000 per operating hour on such sales, totaling $200 million annually" (Blizzard, 2013). Post-GEA, these discourses often challenged Ontario's GEA and the Feed In Tariff (FIT) program, which was often claimed to result in the payment of massive subsidies for inefficient, expensive and unwanted power (e.g., Bailey, 2012; Patterson, 2012; Gough, 2012; Gerrie, 2012; Goldstein, 2010).

The cost of WED was another major theme within the framing of economic risks and benefits pre- and post-GEA. Regarding economic benefits pre- and post-GEA, wind was often referred to as the most cost competitive renewable energy technology. To highlight the cost effectiveness of wind, it was often compared to other technologies, e.g., it was suggested that wind would become more important due to rising costs of oil based energy pre-GEA (Epp, 2008). While post-GEA, it was suggested that wind was cost-competitive with and cheaper than new nuclear energy (Patterson, 2012). While economic risk discourses pre- and post-GEA were similar, they were often backed by specific dollar values. A wind energy scouts claim about wind turbines costing up to $3million and profits taking as long as 10 to 12 years to accrue is an example of this occurrence pre-GEA (Epp, 2005). A similar instance after the GEA was the statement that underground lines for WED could cost between $1.9million and $2.6million (Tremblay, 2012). Unique to the period after the GEA, high costs associated with WED were legitimized using the experiences of

other jurisdictions, e.g., a Danish Member of Parliament was quoted as claiming that WED was an expensive disaster (Stelling, 2009). Before and after the GEA, it was also claimed that the burden of the high cost of wind power would rest on energy consumers through higher electricity bills. This claim was legitimized through experiences within Ontario and abroad, e.g., regarding the deployment of wind power, it was suggested that "Texas electric customers will bear the cost of construction over the next several years, paying about $3 or $4 more per month on their bills…."(Vertuno, 2008), while regarding a WED program in Britain, it was claimed that "Britain's gas and electricity regulator wants the program (wind power development program) scrapped because it has cost consumers billions" (Mattmer, 2007).

Discourses on local scale economic benefits from WED before and after the GEA were dominated by incomes to be earned by households and farmers hosting turbines as well as municipal income from various taxes and charges. A majority of discourses on household income from WED merely stated dollar values of earnings to be made, e.g., pre-GEA a 20-turbine project was projected to generate "between $80,000 and $120,000 a year for the host landowners" (Epp, 2005), while host farmers were projected to earn $20,000 with an extra $5000 split for neighbors in another case (Vivian, 2008). Similarly after the GEA, annual household payments between $25,000 and $50,000 were repeatedly stated (see. Jeffords, 2011; Crosby, 2011; Miner, 2012; Sloan, 2010). The ability of WED to generate income for municipalities before and after the GEA was also dominated by a breakdown of dollar values which would accrue to municipalities such as in the case of two projects which were stated as follows:

> The financial benefits to Saugeen Shores for the Arran project include approximately $24,000 in building permits; approximately $223,000 in the tax levy, with $43,000 being paid to Saugeen Shores….The North Bruce project will see approximately $77,000 in building permits; approximately $75,000 in taxes to be paid to Saugeen Shores (Sloan, 2011).

Unique to the period before the GEA, these municipal-scale economic benefits were legitimized via the experiences of other jurisdictions, e.g., it was stated that in Texas, "wind generating facilities deliver $13.3 million in annual tax revenue for the local counties and schools." (Spotton, 2007).

Before and after the GEA, another recurrent local economic benefit of WED was the fact that the technology does not impact property values negatively. While the absence of these impacts were mainly suggested prior to the GEA, these impacts were legitimized through local and international studies after the GEA. For instance, a property value study in Chatham-Kent Ontario was claimed to have "found no evidence that residential market value in Chatham-Kent has been affected by wind farms" (Gervais, 2010), while a study by Lawrence Berkeley National Laboratory in the US which used "eight different models to assess the sale of 7,500 homes around 24 different wind farms over an 11 year period in the United States" was claimed to have "found on average, there was no conclusive evidence of any widespread property value effects (positive or negative) resulting from the wind farms" (Hornung, 2010).

Contrary to claims about the nonexistence of property value impacts, the existence of these impacts was repeatedly attributed to WED before and after the implementation of the GEA. These negative impacts were mainly presented in the form of community claims and expected declines before the GEA. Following the implementation of the policy, these

impacts were legitimized through the voices of experts such as land brokers, realtors and real estate specialists within Ontario who claimed that buyers were walking away from properties close to turbines and alluded to decreases in property values. A Re/Max Land Exchange broker in Ontario for instance claimed that he had "seen buyers interested in properties....asked questions about wind power and then they walked away" (Pattersion, 2007). Similarly, a realtor within the vicinity of Flesherton, Ontario was also claimed to have stated that "there is a definite resistance on the part of buyers to buy property in areas where turbines" he was also said to have admitted that "there is indeed a drop in property values because of them (turbines), going ahead to claim that "such losses in values are felt up to two miles away" (Golem, 2011). Unique to the period after the GEA, property value dips of between 30% and 50% were stated repeatedly and legitimized via studies in some instances (Grigsby, 2012; Miner, 2012; QMI Agency, 2012; Crosby, 2011). A property value study in Ontario was for instance claimed to have found land values in the vicinity of turbines fall "on average more than 30% -and some by as much as 58%" (Miner, 2012). Unique to post-GEA frames, within discourses on negative property value impacts, injustices within Ontario's GEA were highlighted. In one instance where property value concerns were expressed, it was stated that the policy (i.e., Ontario's GEA)

> removes the ability of municipalities to determine for themselves, if they want to allow wind power development. This creates a powerless tier of government, the one closest to those affected (Foster & Foster, 2011).

Job creation was also framed as a potential risk and benefit of WED. Pre- and post-GEA benefits under this frame provided numerical projections of potential jobs from specific projects in Ontario, e.g., 300 jobs were projected in the case of one project pre-GEA (Lawler, 2006), while 770 jobs were projected in the case of a different project post-

GEA (Jeffords, 2012). Within both time periods, these discourses also drew from wind energy jobs which had been created in other jurisdictions to legitimize benefits through job creation, e.g., it was stated that as many as 80,000 people were employed in German wind energy construction (Cunningham, 2005). A majority of discourses which contrasted the aforementioned job prospects from wind power were advanced after the GEA. These discourses dwelt on the experiences of other jurisdictions and studies to delegitimize job creation via WED. Rooted in the experience of other jurisdictions, jobs from WED were portrayed as extremely expensive and temporal, e.g., in the case of Spain, it was stated that, "each new job in the wind industry has cost taxpayers one million Euros in subsidies and few of these jobs are permanent" (Stelling, 2009). Studies from Europe were also used to delegitimize the potential of jobs from WED. Drawing from European studies, it was for instance stated that approximately "four mainstream jobs are lost for every renewable energy job gained" (Gerrie, 2012). Research from the Fraser Institute in Canada was also used to legitimize job losses in Ontario due to rising energy prices which could be attributed to WED. In a similar vein, an auditor general's review of green policy was said to have revealed huge negative cost implications of wind turbine building jobs (Falk, 2013). The aforementioned frames were also used more directly to delegitimize promises of jobs under Ontario's GEA.

While the framing of economic risks and benefits was coupled with the use of diverse legitimation strategies, there are some common threads which were unique to various risk and benefit frames. Economic risks were generally framed as a shared burden. Property value impacts, increases in power prices and increases in taxpayer's burdens for jobs created via WED are examples of frames which suggested that the majority will suffer

from economic risks associated with WED. While research from various jurisdictions was used to legitimate these economic risks, these risks were also made tangible through the use of concrete examples drawn from Ontario and other jurisdictions. Contrary to the framing of economic risks, the sense of shared economic benefits among citizens was absent within a majority of economic benefit frames. These economic benefits were mainly framed around government and municipal revenue generation. Even in cases where benefits to communities were acknowledged, the scope of these benefits was often limited- mainly payments to landowners and farmers hosting turbines. In terms of job creation from WED, the discourse was centered on wind industry based jobs, while it was mostly acknowledged that majority of these jobs would be temporal.

3.5.2.3 Environmental & Wildlife Frame

While reported environmental benefits were greater in prominence in comparison to environmental risks prior to the implementation of the GEA, environmental risks after the GEA were almost twice more prominent than environmental benefits (see Figure 3.5). This suggests that environmental risk became remarkably more salient within public WED discourses in Ontario following the enactment of the GEA. Key themes which emerged under the environmental frame included climate change, direct wildlife impacts and the implications of WED for wildlife habitats.

Before and after the GEA, environmental benefits were framed around the potential of WED to mitigate climate change through greenhouse gas (GHG) emission reductions. A majority of the discourse on climate change mitigation merely stated GHG emission levels which would accrue from various wind energy projects in Ontario. Pre-GEA, specific

projects were projected to reduce carbon dioxide emissions by 3,000,000 tonnes (Shackleton, 2008) and 300,000 tonnes (Robinet, 2008) respectively. Similarly, GHG gas emissions of 14,000 tonnes and 350 tonnes (Johnson, 2012; Angel, 2012) represent a few instances of emission reductions which were cited after the GEA. The need for emission reductions was often based on climate change and legitimized through scientific evidence, e.g., pre-GEA, it was stated that

> the Arctic Ice Cap" had been "reduced in size by 23% over recent years". Similarly, after the GEA, it was stated that "fossil record shows mass extinctions of life on earth caused by climate change. The last one 65 million years ago when the dinosaurs became extinct….." (Stata, 2010).

Amidst these claims, wind was also justified as a means to reaching Canada's Kyoto target. For instance, it was stated that through WED, Ontario would reduce its share of greenhouse gas emissions by "10 per cent of the Kyoto target" (Mattmer, 2006).

The framing of environmental risks associated with WED pre- and post-GEA was characterized by discourses that challenged the ability of WED to contribute to GHG emission reduction and consequently, climate change. The core issues which were raised include the insignificance of GHG emission reduction from wind, emissions from turbine manufacture and deployment, and the need for unclean sources of power to supplement the variability of wind. These claims were legitimized through occurrences in various jurisdictions and various studies. Before the GEA, it was for instance reported that Britain's energy regulator wanted to scrap WED because "emissions savings delivered are small and almost unbelievably expensive" (Mattmer, 2007). After the GEA, a similar claim was made using Germanys experience as follows: "despite all the wind turbines in Germany (more than 20,000), German CO2 emissions haven't been reduced by even a single

gram"(Stelling, 2009). Regarding WED manufacturing and deployment resulting in increased GHG emissions, a study in Ontario pre-GEA was quoted as follows:

> …. recent study carried out by GE suggested Ontario's current grid infrastructure could handle 5,000 megawatts of wind-generated electricity. Using an average of 15.6 per cent capacity factor, we would need 32,050 turbines installed to come up with 5,000 MW. It would take approximately 224,350 'wide-load' tractor-trailers and their escorts to transport the towers, blades and nacelles to the build sites. The bases for the towers would require over 7,371,500 cubic metres of concrete. Certainly this is not as clean and emission-free (Thompson, 2006).

Similarly, after the GEA, mining of rare earth metals for wind turbine manufacture in China was said to have been "creating an environmental boondoggle of epic proportions" (Blizzard, 2011). After the GEA, it was commonly claimed that WED required polluting energy sources to thrive due to variability. For example, rooted in Denmark's experience, it was claimed that coal demand was increasing due to the "need to plug the gap left by underperforming wind farms"; hence, Danish carbon emissions were said to have risen by 36% in 2006 (Stelling, 2009). A similar claim was made in Ontario and legitimized through a report by Fraser institute which was said to have indicated that "Ontario's pursuit of wind power… might even lead to more smog" (Artuso, 2013).

A major component within the framing of the environment and wildlife implications of WED concerned the implications of WED for wildlife and their respective habitats. While horses, dogs, bees, earthworms and birds were mentioned, a majority of the framing focused on birds. Before and after the GEA, discourses around wildlife benefits did not explicitly deny negative impacts of WED for birds. Rather these impacts were stated as minimal and legitimized via the experience of other jurisdictions. For instance, before the GEA, it was stated that bird kills in the American west were "small to nonexistent in

relation to the millions of birds that are killed every year by cars or by flying into lit-up skyscrapers in large cities" (Reinhart, 2007), while in the Canadian context, it was stated that "each turbine kills an average of two birds a year, which is less than the average house cat" (The Canadian Press, 2007). The post-GEA period had a few instances of studies being used to legitimate these minimal impacts. Based on a study it was for instance noted that

> the number of birds killed in wind developments is substantially lower relative to estimated annual bird casualty rates from a variety of other anthropogenic factors including vehicles, buildings and windows, power transmission lines, communication towers, toxic chemicals including pesticides, and feral and domestic cats (Suzuki, 2011).

Similar to the above quote, a majority of the wildlife benefit discourses deferred to major causes of bird deaths as a mechanism for discursively minimizing the impacts of WED on birds.

The framing of wildlife risks pre- and post-GEA also focused on negative impacts of wind turbines on birds. Unlike wildlife benefits, these risks were explicitly legitimized via diverse forms of research, and the voices of various experts such as biologist, ornithologist and naturalists, experiences of jurisdictions (e.g., America, Europe) and concrete examples of bird deaths. For instance, a study at the University of Calgary was said to have alluded to bat deaths as follows:

> University of Calgary began the study in 2006 after the bats were found below turbines near Pincher Creek. About 90 per cent of the animals had severe respiratory injuries consistent with a sudden drop in air pressure that occurs when they get close to turbine blades. The change in blood pressure caused blood vessels to explode and fill the lungs with blood" (Pritchett, 2008).

Similarly, research from the University of Birmingham was said to have hinted at turbines potentially threatening birds (Suzuki, 2005). A survey of a 120-turbine

development in New York in 2006 was also stated as documenting 23 bird and 59 bat kills annually (Mihell, 2008), while a New York based ornithologist warned about potential irreversible harm to birds which could occur within a Prince Edward County wind power project in Ontario (Vandenbrink, 2013). In the context of Ontario, high levels of bird kills were also reported, e.g., in the case of Wolfe Island wind farm, 688 bird and bat deaths were reported (Gardiner, 2010), while in another report, bird kills were estimated at 1,207 (Schliesmann, 2011). Unique to instances coded after the GEA, negative impact of turbines on other forms of wildlife such as goats, horses and earth worms began to emerge (Henry, 2009).

The mechanisms of framing and legitimation employed within the environment and wildlife frame paint a more holistic and effective picture about risks in comparison to benefits. Regarding the framing of environmental issues in particular, the benefit frame focused on global environmental benefits (e.g., climate change, melting of Arctic ice, Kyoto protocol), which tended to minimize the immediacy of these environmental benefits. Risks on the other hand were framed using concrete examples to suggest that the use of WED to combat climate change mitigation had failed in several jurisdictions. Additionally, studies drawn upon to legitimize the inability of wind to mitigate climate change added some credibility to environmental risk claims. Concerning the wildlife impacts of turbines, the framing also provided a more comprehensive picture of risks in comparison to benefits. While studies and the experiences of several jurisdictions were adopted in the legitimation of wildlife risks, these sources did not explicitly deny the existence of wildlife risks, but rather claimed that these risks were minimal and negligible. Further frames which tended to deflect the focus towards other causes of bird kills tended to suggest that the sources

used to legitimize wildlife benefits were denial. By contrast, the framing of wildlife risks were more diverse, drawing from research, expert voices and examples of actual bird kills within Ontario and abroad. In contrast to wildlife benefit frames, claims that turbines were harmful to wildlife were also more explicit. The framing of wildlife risks therefore told a more holistic story that turbine deaths had been verified by research and various experts, while adding that these deaths were actually taking place with examples of occurrences.

While reported environment and wildlife benefits exceeded risks before the GEA, this trend was reversed after the policy was enacted. Additionally, environment and wildlife was of average salience in comparison to all other frames. While agenda setting reveals variations in the level of salience pre-and post-GEA, the overall framing of environment and wildlife risks and benefits suggests more strongly that public perceptions of these impacts are more likely to be negative than positive. In conjunction with agenda setting, this negativity was likely more prominent after the GEA was enacted.

3.5.2.4 Political Frame

With the exception of the political risk frame which was third most prominent among all risk frames after the GEA, the political frame was generally characterized by low levels of prominence. Political benefits in particular were consistently among the two least prominent frames before and after the GEA. This suggest that public discourses around political risks became very salient after the GEA, while political benefits pre- and post-GEA and political risk discourses pre-GEA were less salient. Despite these variations, an amalgamation of reported political risks and benefits pre- and post-GEA reveals that the political frame was of average salience. In general, the framing of political risks and

benefits concerned (in)justices in the WED process, public participation in the development process, the efficacy of renewable energy polices and community level conflicts.

The framing of political benefits pre- and post-GEA focused on the utility of a democratic process for the successful deployment of wind power. This was legitimized through highlights of instances where effective relationships and communication between developers, communities and sometimes, government was resulting in successful development. The municipality of Kincardine, Ontario was for instance commended by a developer who stated that the continuous quality communication, negotiation and the opportunity (for communities) to comment would facilitate successful WED (Crosby, 2007). Kruger energy was also said to have been enjoying its relationship with landowners who were given the opportunity to partake in the project planning (Epp, 2007). After the GEA, the importance of public engagement in the WED process was legitimized through experiences of other jurisdictions. This is exemplified by the following quote concerning the success of WED in Denmark: "one of the key elements that has made Denmark such as success in this development is co-operation among all levels of government and citizens" (Radojkovic, 2011). Similarly, Ontario's GEA was commended as a policy which requires companies to "consult and engage with municipalities" (Toronto Syndication Services, 2013), while newer development rules were said to make it "very, very difficult for a developer to have a contract approved without a significant engagement with the municipality" (Tremblay, 2013).

Opposite to the framing of political benefits, political risk frames before and after the GEA alluded to a variety of injustices in Ontario's WED process and GEA. Specific

issues which emerged included poor public consultation, the ignoring of public concerns, the lack of sufficient information for communities and various community conflicts which were triggered by WED. Before the GEA, ten municipal councils in Ontario were said to have been seeking moratoriums on development partly because "rather than listen to concerned citizens, the Government of Ontario" had "instead chosen to consider a Green Energy Act, which will remove planning authority for energy projects from municipalities" (Di Cocco & Di Cocco, 2009). There were also complaints about transparency in the development process, e.g, it was stated that "Chatham-Kent residents deserve to see a map that specifically shows the location of each proposed turbine" (Koop, 2008). With the introduction of Ontario's GEA, the framing of political risk deepened. For instance, it was stated that

> before the Green Energy Act came into effect last year, municipalities had the final say over which projects it would approve and had some input into issues such as setbacks. However, the new act shifted control to the province" (Robinet, 2010).

In another instance it was stated that "the Green Energy Act took virtually all the rights of anyone away to have significant and meaningful input" (Toronto Syndication Services, 2013). The issue of Ontarians feeling like they had been kept in the dark regarding WED was also recurrent after the GEA (e.g., Mazur, 2010; Dobrovnik, 2010).

Another major political risk which emerged before and after the GEA was the occurrence of community conflicts due to the nature of the WED process, e.g., pre-GEA, the WED process was for instance said to be "pitting landowners against one another" (Paterson, 2007; Crosby, 2006). These conflicts seemed to deepen after the GEA, when development process was also portrayed as "community splitter", polarizer of rural

communities, adversely affecting neighbors' tranquility and tearing the social fabric into shreds (Schliesmann, 2011; Dakin, 2012). The Ontario Federation of Agriculture demanded moratoriums on developments, claiming that "wind turbines are creating an "untenable" situation by polarizing rural communities. If you get a rent cheque (for a wind turbine), it's pretty good. If you live next door, it's not as good…." (Armstrong, 2012).

One characteristic of the political frame that sets it apart from all the other frames was the fact that the framing of political risks was strongly tied with broader risks under all the frames. This trend became especially evident after the GEA was passed into law, and involved the policy deepening risks within various frames. In one instance, a resident who claimed her family was experiencing health problems from wind turbines was said to have been mounting a legal battle against the wind energy company. Claiming that no one would buy her home, she went ahead to claim that "we are refugees of the Green Energy Act" (Wright, 2012). The mayor of North Bay, Ontario was also reported to have claimed that the GEA was a misleading policy that used the label 'green' to avoid opposition. Premised on these claims, he made the following statement: "You've got a perfect storm for procedural abuses, failed fiscal oversight and gross misuse of taxpayer dollars" (Bailey, 2012). Other examples of these occurrences can be found under each frame.

The political frame possessed some unique characteristics, most notable of which was the fact that the voices of various experts were almost completely missing. While the framing of political benefits often cited the wind industry (e.g., developers and wind energy companies), political risk frames were often hinged on local community perspectives (e.g., individuals, municipal councils, mayors, local farmer groups etc.). Thus, while the former

created the impression that the political appropriateness of WED in Ontario was favouring developers, the latter created the impression that political risks were having negative impacts on individuals and municipalities. In cases where political benefit discourses cited examples in other jurisdictions, e.g., Denmark succeeding because of quality community engagement, the examples did not necessarily speak to Ontario's context. Post-GEA, the integration of political risk discourses with risks under the six frames also made political risks more potent by painting a picture that the GEA was deepening risks under other frames. Coupled with the high prominence of political risks after the GEA, political risks deepened substantially following the implementation of the policy.

3.5.2.5 Technical Frame

Technical risks and benefits were consistently fourth or fifth in prominence among all reported risk and benefit frames coded before and after the GEA respectively. This suggests that the technical details of wind power are not a very salient aspect of public discourses on wind power. While technical benefits exceeded technical risks before the GEA, the trend was reversed after the policy was implemented, suggesting that negative perceptions about wind power within the public sphere in Ontario increased after the GEA was passed into law.

Technical benefit discourses before and after the GEA were similar in nature, highlighting the generation potential of wind power. To legitimize the ability of wind energy to generate power, the articles utilized examples which merely stated projected wind generation levels which would accrue from various projects. These output values were often drawn from the voices of developers and sometimes included claims about by the

number of houses expected to be powered by projects. Pre-GEA, a 121 turbines project which was to be erected in a 20,000-hectare area between Port Elgin and Tiverton was said to "have the potential to produce enough electricity for up to 70,000 homes" (Algie, 2006). Similarly, a project by Suncor was projected to produce "up to 76-megawatts, or the equivalent of 24,000 homes" (Patterson, 2008). Similarly after the GEA, a couple of contracts signed under Ontario's Feed in Tariff (FIT) program were expected to generate over "2,500 megawatts - enough electricity to power 600,000 homes" (Chatham This Week, 2010), while more broadly, the Canadian Wind Energy Association claimed that 2,800MW of installed wind energy in Ontario, could power over 800,000 homes" (Bellerose, 2009).

The framing of technical risks focused on low power generation from WED, grid integration problems and storage problems. These frames were coupled with the utilization of a variety of legitimation mechanisms before and after the GEA. The mechanisms which were used to legitimize these risks included the use of concrete examples from various projects, studies, and voices of experts in Ontario and abroad. Regarding low generation capacity of turbines, the following examples were utilized before the GEA:

> For the five Ontario wind farms that are in operation, the average power output from August 2007 to July 2008 (November to July for the Ripley wind farm) was….29.5 per cent of the nameplate power output. This compares favourably with Germany, which rarely reaches an annual average of 20 per cent" (Stella, 2008).

A report in Denmark was also claimed to have stated that "only three per cent of the wind power was used because of its unreliability" (Robinson, 2007).

After the GEA, it was stated that “two independent German studies are within 2% of each other when they state that the entire wind turbine industry's electrical out-put was less than 25%, a further report from the largest single wind farm in Europe, (140 Wind Turbines) located in Scotland, just across the English border, also produced less than 25% total output for the entire year (Hawkridge, 2010). An engineer representing a wind energy company in Ontario was said to have claimed that “it's unrealistic to expect that wind energy will ever satisfy more than 30% of Ontario's electricity demands”. Further the engineer claimed that “wind energy is not a panacea for North America's energy challenges, and will never solve all of the continent's energy problems” (Epp, 2008). Due to fluctuations in wind power, a report by the Fraser Institute was said to have claimed that Ontario’s “grid requires additional backup power from natural gas plants” (Artuso, 2013). Germany and the U.K were also cited as increasing gas consumption to backup wind due to efficiency problems (Stelling, 2009).

Another technical demerit which recurred before and after the GEA was the fact that the technology faces grid integration problems. This theme was legitimized using experiences from other jurisdictions pre- and post-GEA, e.g., drawing from the experiences of various jurisdictions, the following assertions were made:

> China just closed down 1,400 turbines that could not be integrated into the grid. Texas and California, early promoters, have turned against them and even Denmark, where the folly started and the jobs actually materialized, has a full-blown rural revolt on its hands. So does England (Den, 2011).

Challenges pertaining to grid integration were also acknowledged in Ontario as follows:

> Ontario Power Authority last week raised concerns about the ability of transmission lines in southwestern Ontario especially to meet the demands of transmitting new and existing power (including wind energy) (McNichol, 2006).

While there were other claims about technical demerits of wind power, another major challenge which stood out was the fact that wind could not be stored. This claim became more prevalent after the GEA was implemented, and was legitimized via experiences of other jurisdictions. In the case of "the experience in Germany, which has many wind turbines", it was claimed that "coal-fired generators are still required to be on standby to match peak demands" (Koop, 2008). In Ontario's context, it was also stated that due to the absence of storage for wind power, gas generators have to be built to synchronize the variations in wind output with the ups and downs of electricity demand".....increasing the provinces' "reliance on fossil fuels" (Cleveland, 2011). While it was also claimed that technical solutions such as energy storage from wind had to be deployed before further development of wind energy (Miner, 2012).

Clear distinctions exist between the framing and legitimation of technical risks and benefits. While technical benefits were presented as snapshots of expected generation from various projects in Ontario, the framing of technical weaknesses associated with WED drew from various studies, expert perspectives and the experiences of various jurisdictions to make the case that wind power had numerous technical flaws. These risks were also a lot more diverse. The framing of benefits was legitimated with weaker forms of evidence in the form of projected generation from various projects. By contrast, the framing of risks tell a more holistic story, through expert voices and evidence from studies. By complementing these with concrete examples of technological failures, the framing of these risks seem more tangible. Based on these mechanisms of framing readers are given more

concrete reasons to believe that WED possesses more technical flaws than benefits. This suggests that public perceptions of technical demerits are more likely to be pronounced than perceptions of technical merits. Since technical risks became more prominent in comparison with technical risks after the GEA, which was not the case before the policies enactment, it is very likely that public perceptions about the technical demerits of WED increased after the GEA was passed into law.

3.5.2.6 Aesthetic Frame

While aesthetic benefits were among the two least prominent frames among all benefit frames coded before and after the GEA respectively, aesthetic risks coded before and after the GEA were fourth and fifth in prominence among all risk frames coded within both respective time periods. Notably, aesthetic risks far outweighed aesthetic benefits pre- and post-GEA. This suggests that within the context of Ontario, negative perception of the aesthetic impacts of wind turbines have dominated public perspectives both before and after the GEA. Consistently low coverage of aesthetic issues nonetheless suggests that aesthetics are of less salience compared to the other frames.

Within the framing of aesthetic benefits associated with wind power, turbines were portrayed as beautiful, while visual intrusion was deemed mitigatable through activities such as tree planting. Discourse on the beauty of turbines often compared turbines to other less desirable visual elements. For example, a resident made the following claims: “Visually I myself would rather see a row of wind turbines than a brown haze from a huge power plant” (Hoover, 2007), while in another instance, a resident living within the view of turbines made the following claims:

> as I look out my windows or work in my garden, I find the gentle, constant turning of the blades to be restful, giving a feeling of serene movement to this otherwise pretty flat and boring landscape (Herring, 2009).

Aesthetic risks pertaining to WED before and after the GEA were by contrast legitimized through the experiences of other jurisdictions, studies and voices of various experts. These discourses reflected on individual and community attachments to landscapes based on their aesthetic characteristics and cultural heritage significance. Regarding the use of studies to legitimize negative aesthetic impacts, a survey in New Zealand was said to have revealed that "80 per cent of people living within 3km of turbines find them intrusive" (Stephens, 2007). Aesthetic risks were also legitimized using the perspective of a landscape architecture Professor at the University of Guelph. He was quoted as claiming that "almost half of Grey Highlands is unsuitable for wind energy development" due to negative aesthetic impacts which could result from development (Crosby, 2006).

Pre- and post-GEA discourses under the aesthetic risk frame also justified resistance to WED by highlighting deep connections between individuals and the natural environment; e.g., a WED project in a First Nations community received the following response from a Chief:

> Number one is always the environment….We feel we have a special relationship with Mother Earth and Mother Earth has to be protected but at the same time there are certain developments taking place within our territories" (Algie, 2007).

Regarding a development near the great lakes, the following assertion was made by a resident of the north shore of Lake Superior:

> Over the course of modern history, poets and storytellers have written about the greatest of the great lakes. Its landscapes have been immortalized in the canvasses of the Group of Seven. Canadian musician, Gordon Lightfoot's legendary ballad

> about the Wreck of the Edmund Fitzgerald reminds us that the lake is in charge, and we are merely guests on her shores (Garrett, 2010).

A common theme which also emerged within both time frames was the idea that rural Ontario would be industrialized through the deployment of turbines, e.g, in a specific case WED was referred to as "disastrous industrialization" (Cassidy, 2006). Specifically after the GEA, the aesthetic of flashing red lights from turbines were often problematized.

While aesthetics is likely to be highly subjective, the framing of aesthetics within the media discourses which were analysed painted a more negative picture about the aesthetic impact of turbines, suggesting that public discourses surrounding the aesthetics of WED are more likely to be negative. The framing of aesthetic benefits was backed by statements which asserted that turbines are more beautiful when compared to other environmental factors (e.g., power plant emissions) and claims that aesthetic impacts could be mitigated through activities such as tree planting. With the exception of explicit claims about wind turbines looking beautiful on some landscapes, a majority of the aesthetic benefit frames did not explicitly deny the occurrence of negative aesthetic impacts. Rather, these frames were built around the relative beauty of turbines and opportunities to mitigate negative aesthetic impacts. Additionally, these minimal impacts were not legitimized with research or the perspectives of experts. Aesthetic risks on the other hand were legitimized via studies, and expert perspectives as well as concrete examples. Additionally, these risk claims were rooted in deep seated emotional human-nature connections. This was evident in instances where the discourse was around place attachment, i.e., deep ties between individuals or communities and the environment and the idea that these landscapes were being industrialized via WED. Based on the dominance of reported aesthetic risks over

aesthetic benefits pre- and post-GEA respectively, the workings of agenda setting and framing together suggest the dominance of negative aesthetic impacts of WED in Ontario.

3.6 Discussion

The discussion focuses on the dominant reported risks and benefits which emerged under each of the six frames. To enhance the reliability of the study findings, this section drew on literature which addresses ways in which the emerging issues shape social responses to WED to help make sense of the results. In cases where literature on the social implications of emerging issues does not exist, we reviewed the nature of evidence pertaining to the issues in question. Based on the geographical focus of the study, attention was also paid to studies which have been conducted within Ontario.

The health implications of WED remains one of the most contested aspects of the technology. Discourses and research on the health impacts of wind turbines have generally focused on noise (e.g., low frequency, audible and infrasound from turbines), electromagnetic fields, ice throw from blades and shadow flicker (Knopper *et al*, 2014), with noise receiving a majority of the attention. While a lot of scientific research has been conducted to understand the impacts of turbine noise on health, a systematic review of 252 peer reviewed articles showed that clear evidence of turbines causing health problems have not been established (Schmidt & Klokker, 2014). Nonetheless, most studies consistently conclude that sleep disturbances and annoyance are the main impacts of turbine noise (Bolin *et al*, 2014; Pedersen and Waye 2004; Pedersen & Pedersen & Waye, 2008). Based on the controversial nature of wind turbine health effects, a Health Canada study was conducted to assess the problem. The study found no significant relationships between

increasing wind turbine noise and general quality of life, sleep disorders, sleep disturbance and other health conditions (e.g., tinnitus, dizziness, asthma, diabetes) (Michaud, 2015). Nonetheless, it was concluded that there was a significant relationship between increasing noise levels and annoyance.

Among all the six frames, health had the highest frequency of coded instances (889 coded instances pre- and post-GEA). Reported health risks were also by far the most prominent frame coded before and after the GEA respectively, while the extent to which risks exceeded benefits were greatest within the health frame before and after the GEA respectively. In addition to these trends, the mechanisms of framing and legitimation around health risks told a more holistic and comprehensive story about the existence of negative health impacts from turbines in comparison to the health benefit frame. It is noteworthy that agenda setting and framing of these health risks further intensified following the enactment of the GEA. Based on the workings of agenda setting and framing, health is likely the most salient issue within public WED discourses in Ontario. Further, these perceptions of wind turbine health effects are more likely to be dominated by negative rather than positive perspectives.

Within studies of media coverage of wind turbine health effects within Ontario, similar conclusions have been drawn, e.g., in a study which focused on the negative and positive tone of newspaper coverage on the health impacts of WED (Deignan and Hoffman-Goetz, 2015), it was concluded that community newspapers were more likely to publish negative than positive news, especially after the GEA. Similarly, Deignan *et al* (2013) in a study of fright factors about wing turbines and health within Ontario newspapers concluded

that the existence of fright factors were prevalent in community newspapers, and increased after the GEA was enacted. Within the present study, the deepening of agenda setting and framing within the health risk frame after the GEA was enacted as well as the interlacing of health risks based discourse with complaints about injustices within Ontario's GEA collectively indicate that that the GEA triggered heightened negativity around wind turbine health effects. While the acknowledged studies focused on fright factors and the tone of newspaper coverage, the present study adopted an agenda setting, framing and legitimation lens and came to similar conclusions about local media coverage of wind turbines and health in Ontario. Thus, the present study adds to existing knowledge on alternative mechanisms of media coverage which potentially heighten public perceptions of wind turbine risks, further revealing that weaknesses in the framing and legitimation of health benefits are also likely to heighten public cognisance of health risks surrounding WED.

Within community based studies in Ontario (e.g., Baxter *et al*, 2013, Walker *et al*, 2014), health has been found to be a major predictor of turbine support/resistance. Baxter *et al* (2013) note that this trend differs from studies in other jurisdictions, where issues such as aesthetics have often emerged as a stronger predictor of support/resistance to WED. Based on research in the US and Netherlands for instance, Wolsink (2000; 51) concluded that perceptions of the aesthetics of wind turbines (e.g., perceived impact on scenery and visual intrusion of landscape) have "the strongest impact on attitudes" towards wind power. Inferring from the findings of the present study, agenda setting and the framing of wind turbine health effects within Ontario's local newspapers suggests that health is the most pressing issue within public discourses on WED. This aligns with case study research

within the province (see Baxter *et al*, 2013). Further, this study's findings suggest that health risks are likely to dominate health benefits within public discourses on wind power.

The economic frame was second in prominence with a total 747 instances coded risks and benefits before and after the GEA. In comparison to the third most prominent frame (Environment & Wildlife), the economic frame had 300 more coded instances. Based on agenda setting, it is likely that economic issues are the second most salient issue after health within public WED discourse in Ontario. It is no surprise that Baxter *et al* (2013) in a case control study of social acceptance of WED within two Ontario communities concluded among other things that economic benefits were a consistent predictor of turbine support. While reported economic benefits outweighed economic risks before the GEA within the present study, the trend was reversed after the policy was implemented, suggesting that economic risks became far more salient after the GEA was implemented. The delegitimation of various promises under Ontario's GEA (e.g., promises of jobs which were framed as temporal and an unreasonable cost to tax payers) within economic risk discourses after the GEA also suggests that the policy resulted in more negative framing of the economic implications of WED.

The development of WED presents several economic benefits which stem from income generation for individuals employed during construction and planning, payments to landowners who host turbines on their properties, site managers who monitor and maintain established projects as well as broader economic benefits to communities which are offered in some project-specific cases (Phimister & Roberts, 2012). Existing studies have established strong links between economic benefits and social acceptance, with

literature generally suggesting that economic benefits provided for host communities foster development by promoting social acceptance (e.g., Munday *et al*, 2011; Dinica, 2008). The scope of economic risks and benefits was one unique aspect of the framing and legitimation of economic issues pertaining to WED within the media analysis. Specifically, the framing and legitimation mechanisms used in reporting economic risks tended to create a greater sense of shared burdens among communities (e.g., property value declines, increases in energy bills); while conversely, economic benefits were framed in a ways that suggested they were narrow in scope (e.g., landowner payments, temporal construction jobs). Based on the nature of framing and legitimation around economic benefits and suggestions within literature that economic benefits foster social acceptance, it is likely that communities in Ontario perceive economic benefits to be limited.

There have also been controversies surrounding property value impacts and the likelihood of wind power to disrupt economies that thrive on tourism. While some studies have found some negative property value impacts within specific sites (e.g., Heintzelman & Tuttle, 2012; Sims & Dent, 2007; Sunak & Madlener, 2012), others conclude that these impacts are either minimal or almost non-existent (Sims *et al*, 2008; Vyn & McCullough, 2014). Similar to property value studies, studies on the effects of WED on tourism and consequently, local economies, have also generated a varying outcomes (e.g., Riddington *et al*, 2010; Westerberg *et al*, 2013; Lilley *et al*, 2010; de Sousa *et al*, 2015). These conflicting studies suggest that property value and tourism impacts of WED likely depend on place specificity. Within the present study, majority of the framing of economic risks focused on negative property value impacts of turbines. Conversely, the framing of aesthetic risks was rarely linked to economic impacts. Despite contrasting accounts of the

property value impacts of WED, effective framing and legitimation of negative property value impacts within the media contents analysed suggest that negative property value impact of turbines are a dominant aspect of public discourses on WED in Ontario. Since negative economic discourses increased substantially after the GEA, it is also likely that these negative perceptions of property value impacts further intensified after the policy was passed into law.

With 447 coded instances of reported risks and benefits pre- and post-GEA, the environment and wildlife frame was the third most prominent frame before and after the GEA. This was extremely lower than the prominence of the health and economic frames which were most salient and nonetheless appreciably higher than the aesthetic and technical frames which were by far the least salient. This suggest that environment & wildlife issues are likely of average salience within public perceptions of WED in Ontario. The environment and wildlife frame was characterized by the 'green on green' controversy. This concept was developed by Warren *et al* (2005; 854), who put forward the idea that wind power is characterized by strong dichotomous 'green' arguments—arguments in support of the wind power because of its clean credentials and arguments against the technology based on perceived negative environmental impacts.

The environmental benefits of wind power are often cited as basic rationale for its adoption in various jurisdictional contexts. Among these environmental benefits, the technology has been poised to positively contribute to GHG emission reduction and climate change (see. Allison *et al*, 2014; Yiridoe, 2014). Nonetheless, studies have shown that wind energy is not exactly 'emission free'; e.g, a review of 41 peer-reviewed lifecycle studies on

solar and wind power concluded that wind was in no way ‘emission free’, though acknowledging that wind power could be considered ‘low carbon’ (Nugent & Sovacool, 2014). Emissions from WED were closely tied to the cultivation and fabrication of turbines, construction, operation and decommissioning. While studies dedicated to understanding how these aforementioned environmental factors shape social responses to WED could not be found, the literature merely suggests that these environmental factors shape social responses to varying degrees (Groth and Vogt, 2014).

Within the media analysis of the present study, environmental benefits were framed around climate change and greenhouse gas emissions and legitimized using global events such as the KYOTO protocol and Arctic ice cup depletion. By contrast, these claims were delegitimized through studies and concrete examples around the world which were used to support the idea that WED would contribute little to GHG emission reductions. Additionally, emissions from turbine manufacturing and deployment were cited and legitimized with examples from around the world. Based on the strength of framing and legitimation around environmental risks associated with WED, the present study suggests that public discourse on the environmental implications of WED in Ontario is likely to be characterized by high levels of negativity. While environmental benefits exceeded risks pre-GEA, the trend was reversed after the policy was implemented, suggesting that the GEA might have triggered more negative discourses on the environmental implications of WED.

A major theme within the framing of environment and wildlife risks concerned the impact of turbines on wildlife. While dedicated studies have not been conducted to

understand how public perceptions of wildlife impacts shape social responses to WED, existing literature gives us reasons to believe that perceptions of wildlife impacts could play a major role in shaping social responses within some jurisdictions, e.g., in an analysis of 700 objection letters which were submitted against a WED project in rural Scotland, ornithology emerged as one of the most dominant issues, occurring within 2,228 of the comments (Aitken *et al*, 2008). Regarding actual studies of turbine impacts on birds and bats, the mortality of bats due to wind turbines has been documented globally (Rydell *et al*. 2010). In US and Canada alone, approximately half a million annual deaths have been documented (Hayes, 2013; Arnett and Baerwald, 2013), suggesting that "bat mortality is arguably the most significant environmental impact of industrial wind power" (Jameson & Willis, 2014; 145). Considering the strength of wildlife risk framing within the present study and relative weaknesses in the framing of wildlife benefits associated with WED, this study predicts that community discourses around the wildlife implications of WED in Ontario are likely to be more negative than positive. Based on more negative environment and wildlife impacts reported after the GEA, it is likely that perceptions of negative wildlife impacts deepened following the enactment of Ontario's GEA.

Central themes within the political frame included public engagement, (in) justices in the WED process and community relationships. Overall, the political frame was fourth in prominence among all reported risks and benefits coded under each of the six frames before and after the GEA. What is most striking about this frame is the large extent to which reported risks exceeded benefits after the GEA (i.e., risks were 7 times more prominent than benefits). Based on the agenda setting theory, political issues are likely of average salience within public perceptions of WED in Ontario. Further, while these perceptions

were more negative than positive within both time periods, it is likely that negative political perspectives intensified following the implementation of the GEA.

Literature on social responses to WED sheds a lot of light on the role of the development process for successful deployment. Existing literature for instance demonstrates that public participation in the WED process is critical to social acceptance (Ellis *et al*, 2009; Loring, 2007, Breukers and Wolsink, 2007; Wolsink, 2000; Songsore and Buzzelli, 2014a). Specific to the case of Ontario, studies indicate that inadequacies in communication and public engagement have emerged as major contributors to controversies around WED (Hill & Knott, 2010). While discourses within the political benefit frame of the current study provided few snapshots to suggest that the development process in Ontario was fair, these were overshadowed by political risk discourse which were a lot more prominent, providing numerous examples of injustices in Ontario's WED process. Additionally, political benefit discourses were mainly advanced by the wind industry, while political risks were advanced by individuals, communities and municipal officials. This further paints the picture that political conditions are more favourable for developers in comparison to communities. The implementation of the GEA resulted in the emergence of discourses on injustices and unfairness in the development process. These discourses confounded and deepened risk based discourse under all six frames. These workings of agenda setting and framing together therefore suggest that perceptions of injustices in the WED process are a salient component of public discourse surrounding the technology.

While reported technical risks exceeded technical benefits before the GEA, this trend was reversed after the policy was enacted. The technical frame was however unique in the sense that differences between risks and benefits before and after the GEA were negligible. The technical frame recorded the second least total coded instances (279). This suggest that the technical aspects of WED are not of great salience within community level WED discourses in Ontario. The mechanisms of framing within the technical frame suggest that public discourses surrounding the technicalities of wind power are likely to be negative. By providing details of expected power output from various wind energy projects and the number of houses expected to be powered by these projects, the technical benefit discourse basically reiterated the basic rationale for WED, which is to generate electricity. By contrast technical risks were framed around various technical viability concerns which included viability, grid integration problems, and low generation from WED. These were legitimized through the experiences of other jurisdictions as well as studies and expert perspectives. Within literature on social responses to WED, public knowledge of technical details and the implications of this knowledge for acceptance/ rejection has not been probed. Nonetheless, extensive research exists on the technical aspects of wind power.

The adequacy of electricity grids and grid based infrastructure has for instance been found to be a major determinant of successful wind energy deployment (Steinbach, 2013; Eleftheriadis & Anagnostopoulou, 2015). The reliance of wind power on nature also results in the technology producing varying amounts of power which are dependent on changing wind speeds (Whitehouse *et al*, 2014). Though beneficial in some respects, wind power is not devoid of technical challenges. The focus of framing on these technical challenges and

the effectiveness of legitimization strategies employed to highlight them suggests that these technical risks are likely to be a dominant part of community discourses on WED.

Within the media discourses which were analysed, there were varying aesthetic risks and benefits associated with WED. The aesthetic frame was however the least prominent frame with a total of 256 coded instances before and after the GEA, suggesting that aesthetics are one of the least salient issues within public discourse on WED in Ontario. Numerous studies have considered the impact(s) of aesthetics on social acceptance of WED (e.g., Haggett and Toke, 2006; Solli, 2010; Eltham *et al*., 2008). Though there have been varying accounts of the role of aesthetics in shaping social responses to WED, a majority of these studies suggest that aesthetics plays a major role in shaping social responses to WED. Wolsink (2000) for instance suggested that aesthetics is the best predictor of social responses to WED. This perspective has been endorsed by other researchers (e.g., Warren *et al*, 2005).

While most of the aforementioned studies on the aesthetic impacts of WED have focused on the way(s) turbines disrupt landscape views, others have provided more complex insights on aesthetic impacts, e.g., Jessup (2010) suggests that a loss of the symbolic value of landscapes likely triggers most of the opposition on aesthetic grounds. Within the present study, aesthetic benefits were framed around the beauty of turbines and the idea that aesthetic impacts could be minimized. Nonetheless, potential negative aesthetic impacts associated with WED were often subtly acknowledged within these dominant benefit frames. By contrast, aesthetic risks were more explicitly framed around negative visual impacts of turbines and place attachment. These perspectives were

legitimized through expert opinions, studies and various examples on the ground. Additionally, these risk frames highlighted deep seated emotional and symbolic values of various landscapes which would be lost to WED. The prominence of reported aesthetic risks far outweighed aesthetic benefits before and after the GEA. While the aesthetics impacts of WED is very subjective, agenda setting, framing and legitimation of aesthetic risks and benefits within local newspapers in Ontario suggests that the aesthetic discourses pertaining to WED in Ontario are more likely to be negative.

Conclusions

Decades of research on the social aspects of WED show that social responses to the technology are complex and multifaceted in nature (Hammami *et al*, 2014; Brownlee *et al*, 2015; Frantal, 2014); hence, triggering more recent calls for studies which utilize multi-dimensional approaches to understand the social aspects of WED (Richards *et al*, 2012). Nonetheless, literature on the social aspects of wind power is dominated by community case studies of specific issues or few issues perceived to play a major role in shaping social responses to a technology. By utilizing Luhmann's (1989) theory of ecological communication in a retrospective eight-year content and frame analysis of local newspapers circulated within the province of Ontario, the present study contributes to limited but growing research which seeks to understand WED through a multidimensional lens.

Based on the agenda setting theory, the present study concludes that health and economics are likely the most salient factors within public wind energy discourse in Ontario, while environment & wildlife and political issues are likely next in salience.

Finally, aesthetics and technical factors are likely to be least salient within public WED discourses.

The mechanisms of framing and legitimation which were used to present risks under the six frames were generally more comprehensive in comparison to benefits. These risk claims were usually legitimized through the voices of experts, studies and concrete examples which suggested they were actually occurring. However, this was not the case for the framing of benefits. The media discourses analysed therefore generally provided better justifications for the negative implications of WED under all the six frames than it did for positive implications. Hence, the powerful nature of risk based discourses within the media is not only rooted in framing and legitimation, but also agenda setting. Overall, these trends suggest that public discourses around WED in Ontario are likely to be negative.

While the political frame was of average prominence in comparison to all other risk and benefit frames, it possessed some unique characteristics. Particularly, political risks were immensely more prominent than political benefits. This was especially evident after the enactment of the GEA. Within the political risk frame, perceptions of injustices in Ontario's GEA confounded and depend risk-based discourses under the six frames. Similar findings in a media content analysis of national newspapers circulated in Ontario led Songsore and Buzzelli (2014a) to conclude that social conflicts surrounding WED were more rooted in the development process (i.e., energy policies) than the products (physical presence of turbines) of WED. The current study provides evidence to support the idea that the development process (i.e., Ontario's GEA) plays a major role in triggering negative WED discourses, especially following the enactment of the GEA. It is noteworthy that the

province of Ontario experienced an unprecedented growth in the number of resistance groups battling WED following the enactment of the GEA (see. Songsore and Buzzelli, 2014a). Hence, the findings of this study that suggest that public WED discourses became more risk-centered after the GEA correspond with occurrences on the ground.

This study reveals economic, environment & wildlife, technical, political, aesthetic and health issues (i.e., risks and benefits) at the core of WED discourses in Ontario. Within the discussion, it is clear that research on the aforementioned issues is often characterized by conflicting outcomes. Literature on the social aspects of WED also reveals that the aforementioned issues tend to have different degrees of significance in shaping social responses to the technology within different jurisdictional contexts. Nonetheless, each community faced with a WED project has to grapple with these broad range of issues. This highlights the importance of community engagement in the development process. However, the streamlining of the development process through Ontario's GEA does not allow deep levels of community engagement which could help developers and communities work together to address cherished community values which could be affected by developments. Based on the complexity of issues which communities have to deal with, such deep levels of engagement could help foster better WED in the case of Ontario. In the absence of proper community engagement, conflicts around the development of wind power within the province will likely persist.

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CHAPTER 4

Wind Energy Development in Ontario: Understanding Developer Perspectives and Experiences

4. Abstract

The province of Ontario has shown significant support for wind energy development. This is evident in the Green Energy Act of Ontario (2009) and Ontario's Long Term Energy Plan (2013), both aimed at speeding up the deployment of renewable energy and particularly, wind power. Through interviews with developers, this study asks whether and to what extent the success and/or failure of wind energy developers is hindered or promoted by Ontario's policy environment and other factors such as developer relations with communities. The study concludes that, while feed-in tariffs under the GEA have arguably been the strongest driver of developer success, attempts to reduce delays faced by developers have introduced their own problems in the development process. This is particularly true of community engagement processes. The study concludes with some recommendations for creating a better policy environment for developers, which includes the need for policy specificity around community engagement and potentially, community ownership of projects.

4.1 Introduction and Policy Context

To varying degrees, all Canadian provinces are pursuing renewable energy development. At a broad level, this paradigm shift towards renewables has been driven by energy insecurity, climate change and concerns about pollution from energy generation

(Environment Canada, 2015). Wind energy is currently the fastest growing renewable energy technology in the world. Its merits include cost effectiveness (Makridis, 2013), its ability to be deployed quickly (Volkwein *et al*, 2015), low lifecycle emissions (Jacobson, 2009) and the long lifespan of wind farms (Lalitha et al, 2014). The technology has its limitations as well but these merits help us to understand why wind energy is receiving widespread attention.

Within Canada, Ontario arguably has the most ambitious targets for renewable energy development. In 2009, the province enacted the Green Energy and Green Economy Act (henceforth, GEA) with the aim of becoming a world leader in renewable energy deployment and related job creation among other goals (Ontario Ministry of Energy, 2008, 2015). Based on the abundance of wind energy potential in Ontario, the GEA has resulted in ongoing massive deployment of wind power across the province. Ontario currently leads all Canadian provinces in wind energy development (henceforth, WED) with a generation capacity of 3,927MW, representing approximately 40% of Canada's total installed capacity. Ontario also boasts of becoming the first North American province to phase out energy generation from coal, akin to the successful deployment of wind power (Canadian Wind Energy Association, 2015).

The most significant aspects of the GEA included the establishment of feed-in tariffs (henceforth, FITs) and the amendment of various policies with the aim of eliminating bureaucratic red tape which could hinder WED. FITs created an attractive market for renewable investments by providing 20-year long fixed prices for energy generated from renewable sources. Wind energy was for instance offered a fixed rate of 13.5cents/kWh over a 20 year period (Independent Electricity System Operator, 2009). It is noteworthy

that Ontario was the first jurisdiction in North America to establish FITs. The policies amended under the GEA included the Energy Efficiency Act, Environmental Protection Act), Co-operative corporations Act, Building Code Act and a host of others. More significantly, municipal powers over the planning, location and approval of wind energy projects were revoked by the policy (Hill & Knott, 2010). The GEA provided opportunities for public hearings under two conditions: (1) in cases with proof of "serious harm to human health or serious and (2) based on "proven irreversible harm to plant life, animal life and the natural environment" (Bill 150, 2009, p.48), while decisions of the tribunal were also limited to these parameters.

The most significant changes to the GEA to date were introduced under Ontario's Long Term Energy Plan (2013), which amended FITs and the general protocol for developing wind energy. The most noteworthy aspects of these changes were the introduction of a competitive procurement process aimed at awarding contracts based on cost-effectiveness and the ability of developers to demonstrate quality engagement with communities designated for projects. The aforementioned conditions apply to projects greater than 500kilowatts in capacity (Ontario Long Term Energy Plan, 2013). Even with these amendments to the GEA, Ontario remains strongly committed to the development of renewable energy. For example, the province expects 200MW of new wind energy in 2015 alone (Ontario's Long Term Energy Plan, 2013).

In the quest to understand WED, there has been a tremendous growth in literature on the social aspects of WED and specifically, social acceptance (Swofford & Slattery, 2010). The growth of such literature dates back to the 1990's (Batel *et al*, 2013). In contrast, relatively few studies have been conducted to understand the factors that

promote or hinder deployment among developers (e.g., O'keeffe & Haggett, 2012; Schaefer *et al*, 2012; Friebe *et al*, 2014). In spite of the relative novelty of WED in Ontario compared to other jurisdictions (e.g., Europe), there have been a substantial number studies that have sought to understand the social aspects of wind power (e.g., Baxter *et al*, 2013; Shepherd *et al*, 2011; Walker *et al*, 2014) and the nature of media coverage on WED (Deignan *et al*, 2013; Songsore and Buzzelli, 2014a). Nonetheless, little is known about the challenges faced by wind energy developers and the nature of developer-community relationships following the commissioning of projects.

Through in-depth semi-structured interviews with wind energy developers in Ontario, this paper asks how economic, political, environment & wildlife, health, aesthetics and technical factors foster or hamper the deployment of wind power. As well, the paper seeks to understand how developers interact with communities when the aforementioned issues arise pre- and post-development. By doing so, the study will provide insights on the efficacy of renewable energy policies in Ontario.

4.2 Overview of literature and theory

This section reviews the two major clusters of literature that have sought to understand WED and policy outcomes. These include literatures on the ways developers and communities impact the deployment of the technology respectively. Building on the literature review, the theoretical framework that will guide the current study is then presented.

It is widely accepted that community acceptance is a key determinant of successful WED (Howard, 2015). Hence, substantial research has been conducted to

understand how community-level factors affect social acceptance and consequently, deployment and policy outcomes. Studies on the social aspects of WED are diverse, focusing on the role of economic factors such as community benefits and ownership in facilitating social acceptance (See. Cowell *et al*, 2011; Munday *et al*, 2011; Slee, 2015), the role of health concerns in triggering the (un)acceptance of projects (see. Songsore and Buzzelli, 2014b), the role of aesthetic in shaping social responses to developments (Pasqualetti, 2011; Bell *et al*, 2005) and a host of other factors.

Though social acceptance plays a major role in fostering the success of WED, it might not always be the most significant roadblock to deployment. For example, a comparison of major issues that arose within public opposition to issues within "the official report of the planning appeals process" for a development in rural Scotland revealed that resistance had a negligible impact on eventual rulings (Aitken *et al*, 2008; 777). This finding alerts us to possibility that challenges to WED could result from the activities of other stakeholders such as developers and policy makers. For example, Wolsink (1996; 1079) revealed that ineffective policies such as "relying on large-scale applications by utilities…and aloofness in the process of obtaining sites" hindered the success of WED in Denmark. Likewise, it could be assumed that the activities of developers who are at the center of WED could impact developments.

Relative to literature on the social aspects of WED, there is limited but growing research seeking to uncover successes and hindrances faced by wind energy developers. Many of these studies have considered the impact of technical factors on the success of WED. Specifically, grid integration and the intermittency of wind power have received substantial attention (Georgilakis, 2008; O'keeffe & Haggett, 2012). The impact of

economic factors on the success of wind energy developers has also received some attention, with studies suggesting that sufficient financial support (e.g., developers' ability to finance projects, financial risk reduction mechanisms and FITs) attract developers and contribute to their success (Luthi & Prassler, 2011; Friebe *et al*, 2014; Lam *et al*, 2013). Finally, policy environments that are supportive of WED have been found to promote developer success (Friebe *et al*, 2014).

As is evident from the review of literature above, the study of developers has been centered on economic, technical and policy factors to the neglect of other issues. While acknowledging research on various determinants of WED from the perspective and experiences of developers, Richards *et al* (2012; 691) identified the "need for multidimensional analyses of these barriers and identification of the most significant underlying barriers if viable solutions are to be developed". The same complexity was identified by Devine-Wright (2005) several years ago. Luhmann (1989) provided a structure for gaining an integrated understanding of environmental issues. According to Luhmann (1989), western societies respond to environmental disturbances through a set of functional social subsystems (i.e., religion, science, economy, politics, education and law). Communication across these subsystems then constitute the mechanism for responding to environmental disturbances. Adopting Luhmann's theory, Stephens *et al* (2009) developed six discreet risk and benefit frames central to WED (i.e., economics, aesthetics, environment & wildlife, political, technical and health). These frames embody the key themes at the center of research on WED as seen by developers and communities alike. Further, Stephens *et al* (2008) developed the socio-political evaluation of energy deployment (SPEED) framework to facilitate the multidimensional understanding of

renewable energy deployment. The framework advocates the analysis of multiple determinants of energy development (e.g., economic, technical, political and a host of other factors) and encourages the use of multiple methodological approaches (e.g., policy review analysis, media analysis and stakeholder interviews).

A combination of the SPEED framework and the adoption of Luhmann's (1989) theory as encouraged by Stephens *et al* (2009) has been used to gain a holistic and integrated understanding of state level variations in energy deployment (Stephens *et al*, 2009; Fischlein *et al*, 2010) as well as social responses to WED (Songsore and Buzzelli, 2014a). In interviews with various policy stakeholders (including members of the wind industry), Fischliein *et al* (2010) for instance gained insights on varying trajectories which contributed to variations in deployment outcomes within multiple U.S. states.

Integrating the above approaches, the current study seeks to gain an integrated understand the factors that promote or hinder WED from the perspective of wind energy developers in Ontario. As little is known about the way developers negotiate and maintain relationships with host communities or even conceptualize host communities (e.g., Burningham, 2015), this study also seeks to understand how issues pertaining to the six discrete frames impact developer relationships with host communities.

4.3 Methods

This study is part of a broader research project that seeks to understand the factors that promote or hamper WED Ontario. Since the goal of the current study is to understand the perspectives and experiences of developers, a catalogue of existing wind energy companies (n=~14) with projects in Ontario was first gathered from Ontario's

Ministry of Environment (2015) website. A total of 31 emails were sent to both general company websites and individuals whose contacts were available on company websites. These were followed up with phone calls. A total of 8 participants were recruited for the study, each having an average of seven years' experience in the renewable energy sector (i.e., experiences before and after the implementation of Ontario's GEA). This represents a 25 percent response rate. Ethics approval was granted by the Non-medical Research Ethics Board of Western Universities (See. Appendix). Though the letter of information assured developers of confidentiality, the difficulty in recruiting participants and the refusal to participate in some cases likely resulted from insecurities concerning the disclosure of confidential company information. In a study that sought to understand the major drivers of wind energy investments in China, for instance, Lam *et al* (2013) reported that no wind energy developer or manufacturer agreed to participate in their survey. They therefore conducted surveys among global researchers in the area of WED.

For the purposes of the present study, developers were given the opportunity to choose the most convenient mode of communication for interviews (i.e., Skype, face to face or telephone). While one interview was conducted face to face, all other interviews were conducted by telephone. On average, interviews spanned 80 minutes. All interviews were recorded, transcribed verbatim, edited and analysed with NVivo 10, a qualitative text data analysis software program.

Semi-structured interviews were used because they allow for a combination of closed-ended questions. This makes it easy to compare perspectives and open ended questions, which allow for an in-depth exploration of individual stories and experiences (Sankar *et al*, 2008; Schensul *et al*, 1999; Gordon *et al*, 2012). The semi-structured

interview instrument was developed based on an eight-year longitudinal media content analysis that was conducted to document and analyse major risks and benefits associated with WED in Ontario as well as major themes within literature on WED (as presented in Chapters 1 through 4). Local newspapers circulated within communities hosting wind energy projects in Ontario were used for the content analysis. Interviews were structured around the six major frames adopted for the media analysis (see Stephens *et al*, 2009). For example, based on the diversity of risks and benefits associated with the GEA within media discourse, developers were asked about their general perceptions on the merits and demerits of the policy. As well, turbine impacts on birds and bats was a recurrent theme within media discourse; hence, developers were asked about how turbines were impacting avian species. The goal was to understand how the activities of developers are either promoted or hindered by economic, environment & wildlife, technical, political (policy), health and aesthetic factors which arise in the context of WED. The way developers resolve conflicts with communities around the aforementioned themes were also explored during interviews.

4.4 Results

This section presents results of key themes that emerged within interviews with developers. The results are presented according to the six discrete theoretical frames (i.e., economic, political, health, environment & wildlife, aesthetic and technical). For the purposes of anonymity, participants are identified with pseudonyms ranging from interviewee one (I1) to interviewee 8 (I8). For the same purposes, geographical locations in Ontario which were mentioned during interviews are not identified. All other identifiers, direct or implicit, are also screened out of the discussion.

4.4.1 Impacts of politics and policy on developer experiences

Within the political frame, questions concerned the GEA, community engagement, Ontario's wind energy resistance movement and developer relationships with host communities. As a general opening question, developers were asked to highlight the general merits and demerits of the GEA that stood out to them. Regarding the merits of the policy, there was general consensus that it acted as an effective enabler of WED by providing a secure environment for investments in the technology, especially through FITs. For example, one interviewee stated that that the policy "provided certainty that if you spend all the time and effort to develop a project…you would have a buyer for the electricity" [I6], while two other developers described the policy as "a bold initiative to start the energy transition here in Ontario" [I4] and as "instrumental in allowing wind energy to grow at the rate that it did" [I2].

Despite commending the GEA for being a kick-starter of WED, all developers felt that it was poorly implemented for various reasons and to varying degrees. The most prominent of these reasons was the fact that the policy alienated communities and municipalities from the development process. Developers did not only perceive 'engagement' as the ability of communities to have a say in the development process, but also, the ability of communities to actively develop wind power:

> "it [the GEA] was never setup to enable communities to develop renewable energy, and countries that have been most successful in gaining a social license for wind in particular have been countries whose policy was very much geared towards communities starting projects on their own…I think that there is very little room for community members and people closest to projects to have meaningful input into projects. They are engaged to varying degrees, but usually at a point in time where most of what they have to say can't make much of an impact…..best case scenario we would have a situation where the policy had been trying to get communities to drive renewable energy projects but that is not what we have. [I5]

Other themes that emerged as hindrances to the quality engagement of communities under the GEA were complexities within the development process and the lack of incentives for community engagement. Concerning the former, a few developers were of the view that that the breadth (i.e., large volume) and depth (i.e., complexity) of various assessments and approval documents automatically alienated communities from the development process. Reflecting on this problem, one developer complained about environmental review documents being over 3000 pages long, claiming that it would be difficult for the average citizen to digest such material fully and actually hold developers accountable. Similarly, in reference to the development process, another developer reiterated that *"*…it is a very complex application process….for the laymen it's really difficult to follow" [I8].

Regarding the lack of incentives for community engagement, some developers mentioned the bureaucratic nature of the WED process, claiming that assessments and approvals involve approximately 2-4 years of hefty financial investments. Hence, they felt unmotivated to welcome changes after approvals, since that would almost require going through the whole approval process from scratch. Deducing from these insights, the fear/ unwillingness of developers to engage with communities or integrate community perspectives could result from their quest to protect their investments (i.e., time and financial resources spent obtaining approvals). This is exemplified in the following quote that highlights the difficulty in making changes to projects:

> ….What they say [i.e., what Ministries say when projects require amendments] is you have to resubmit from the beginning, we will consider it in due time.….as a developer, we just went through two years waiting for them to get to a decision, and they say you have to start over. So where is the incentive for the developer to go over to the community member and say, you know what, you are right, that works?....you do all your reports and you get everything located. Now you've spent

> all your money….in the second public meeting people start complaining about it…..okay, well it took me two years to get here [I1]

Another disincentive to public engagement which developers identified was the fact that all projects, irrespective of their scale (i.e., small scale or large scale) and/or orientation (i.e., community or commercial) were being offered the same rate under the FIT program. One developer suggested that community projects, which are likely to be small scale, would potentially find it difficult to stand on their own feet, while bigger projects generally find it easy to succeed. The lack of stronger financial support for smaller 'community scale' projects was therefore perceived as a disincentive to community engagement specifically in the form of ownership.

Developers were asked specifically about the extent to which they felt the GEA allowed for community engagement in the WED process. While some of the themes that emerged were similar to those discussed above, some new issues emerged. Most noteworthy was the idea that community engagement required under the GEA was insufficient; one developer, for instance, stated that he supported claims by the anti-wind community that "real community engagement" [I1] was nonexistent under the GEA. Similarly, others stressed that 'sufficient' community engagement could only be achieved by going beyond the regulatory requirements. Siting experiences, they provided various mechanisms through which regulatory requirements could be transcended to achieve sufficient community engagement (e.g., belonging to the community, holding more meetings and consultations than required under the GEA, sending multiple communications via media, delivering flyers, organizing social events within host communities, etc.). The following quotes demonstrate dissatisfactions with regulatory requirements for community engagement and the felt need to transcend them:

> ……not all companies will reach out to communities to the extent that they could. They will do what they are mandated to do under the legislation and they won't go beyond that…we got involved the organizations that were sort of the leading organizations in the community….We walked up and down the streets, all of these roads and we talked to people continually, over two years….[I5]
>
> I think, you know, being part of the community allows you to sort of keep a pulse on what's happening and I think ongoing communication with the municipality is important. Showing up to municipal meetings is also important. You know, we still fund projects that are part of the community after we've become operational. [I8]

Similar to developers' views on the distribution of economic benefits to communities, which is discussed in an upcoming section, some developers struggled with delineating communities spatially when deciding who to involve or exclude when conducting engagement. Rooted in similar struggles, others questioned what 'community' should mean spatially. For example, one developer after questioning the definition of community stated that landowners, neighbours and "the people in sort of the immediate vicinity of the wind turbine or the wind turbines will be more involved. We have some people who think they should be consulted when they live 30KM away…. [I6]. Another major issue that was mentioned by one developer was the fact that project proponents are not fair to communities when they refuse to be present at public consultations and rely on third party consultants who come from overseas in some cases [I5]. In this context, the developer argued that quality engagement can only occur when proponents of projects are present during consultations with communities and take on the responsibility to sufficiently engage and provide in-depth answers to questions asked by communities.

One of the most noteworthy activities surrounding WED in Ontario has been the emergence of the resistance movement. Developers were therefore asked about their perceptions of the wind energy resistant movement (both positive and negative) and the impacts of the movement on their respective projects. Some developers noted that

opposition was in itself not wrong; hence, the need to distinguish between two types of opposition: (1) opposition from resistance groups seeking to stop projects at all cost and (2) opposition from individuals within host communities who have genuine concerns. In the case of the former, most developers found it distractive with no opportunities for dialogue as it took radical forms; conversely, they found the latter easier to address, as it was usually self-controlled and created better opportunities for discussions and the collective for solutions.

Two developers perceived the resistance movement as very well organized and having some positive impacts on WED. The first respondent stated that the resistance movement has increased accountability from developers and *"*in some cases secured other benefits for the community that would not have been there otherwise. So there are some positive aspects*"* [I4]. The second interviewee acknowledged benefiting from detailed resources that resistance groups published on their websites:

> …they have time to put together all kinds of statistics and maps and they actually create resources that I have used …so I look at their resources all the time. You know, a lot of their stuff isn't necessarily accurate …But there are some things that are just facts that they have put together that are much better resources than anything I have seen ….. [I5]

While some developers claimed that they had not faced any opposition from resistance groups, these groups were collectively framed as a 'vocal minority' and a 'destructive influence' which usually emerged from outside host communities. As such developers did not feel threatened by their activities, as most of them were confident that there existed a "silent majority" [I2] in support of their projects. As such, most developers felt the need to point to cordial relationships that they enjoy with host communities. A developer made the flowing statements regarding the activities of the resistance movement and

specifically Wind Concerns Ontario (WCO) which acts as a mother group for smaller resistance groups across Ontario:

> They are people who live in the town beside us that are trying to fight the project….but it is not really reflective of the project…so I will say that there is a lot of outside influence coming into these communities and trying to force issues where there wouldn't otherwise be any. I think that is hugely distractive, hugely distractive....while we were trying to negotiate and figure things out, WCO came into town….and tried to stir up the neighborhood. That WCO force right, stirred up a place where there was no issue and now that they are gone, there is no issue again….that project hasn't had a single complaint since it's been up and running …no one has had any issue with it whatsoever….[I1]

Developers acknowledged that the activities of the resistant movement have had varying degrees of impact on their respective projects. These impacts mainly included slowing down various projects which some interviewees felt is a major tactic of the movement, painting developers with a negative brush, distracting community consultation sessions through rowdy activities and misinforming communities about wind power and the wind industry in general. Most notable among these impacts was the fact that resistance group activities resulted in developers incurring higher costs mainly through delaying tactics:

> Akin to some of the negative impacts we've seen from opposition groups is delay tactics. So you will see that the motivation for a lot of this opposition is to frustrate the regulatory and approval process…..while they have like I said no true credible basis, they often have very legitimate concerns. The form in which they choose to exercise those concerns is often through the approval process. So you will see frequent delays in project approvals in their construction and commissioning of the projects, and that adds significant costs to developers. [I2]

Developers were asked which aspects of the GEA could be amended to improve the WED process in Ontario. The most recurrent theme in their responses was the need for better community engagement in the development process. This was not surprising, since throughout interviews, some developers expressed the viewpoint that current forms

of engagement required under the GEA were inadequate. In reference to consultations required under the GEA, one developer for instance made the following claims:

> I still think that what is considered a consultation process…you know people hear that word and they don't recognize that it's bureaucratic language. They think somebody is actually going to care what they have to say, right. That their input is in some way equal….and it's not. It's very difficult. I mean something like a wind project is extremely expensive….and you know, it's not like you can involve people in what turbine you are going to use, how tall it's gonna be or where its going to be sited. [I5]

As evident in the quote above, some developers also struggled with the extent to which communities could be engaged. Other issues which came up as necessary policy amendments to the GEA included the need for policy instruments to empower communities to develop wind energy, own projects participate more effectively in the development process. As well, developers pointed out the need to involve communities earlier on in the development process to enable them understand the deployment process and its associated decisions. Some developers also pointed to the new renewable energy procurement system that challenges developers to demonstrate community engagement as part of the requirements for securing a project. Despite these calls for greater community engagement, interviewees were also of the view that municipalities and communities need to put in work to enable effective developer-community cooperation:

> I think one of the most negative things that came out of the GEA was the taking away of the municipality's rights to participate. That to me was big bit red flag so if they could reverse that policy…but municipalities also have to learn how to play as well. They have to be able to be cooperative……if municipalities and people can educate themselves and maybe learn to work with developers, then I think we should roll that back into the GEA [I7]

Developers also felt the minimization of bureaucracies, delays and upfront risks in the development process would help facilitate better WED by giving them the opportunity to engage communities more deeply. Concerning the minimization of upfront risks, one

developer complained about the GEA requiring developers to make huge investments prior to receiving approvals and facing appeals. This resulted in developers having to "fight to the death" [I3] with all their money at stake, consequently resulting in a system where developers have become unwilling to incorporate changes post approval. Rather, the developer suggested returning to the old Ontario Municipal Board process where upfront costs were minimal; hence, maximizing developers' willingness to be flexible to the idea of incorporating changes:

> Now the OMB process was planning approval…and someone will appeal it, you've just put in your plan, someone has appealed it, you have not invested all that money…you also have the opportunity that if there is an issue with the plan, you can make an adjustment there, right, and then it's an adjusted plan moving forward that incorporates the needs of the community and then you move forward….and then you spend all your money and the project gets built better.[I1]

4.4.2 Impacts of economics on developer experiences

Economic issues that were discussed with developers included financial roadblocks to WED, the attractiveness of Ontario's renewable energy market, perceptions about property value impacts of turbines and the role of economic benefits in fostering social acceptance. In general, developers were of the view that the introduction of FITs under the GEA created an economically healthy environment for WED and investments. Some developers compared pre- and post- GEA conditions for WED to better highlight the attractiveness of FIT regime. For example, referring to rates offered under the GEA, a developer of a pre-GEA project stated that "13.5 cents per kwh is quite a healthy amount. That's rich. I wish I was getting 13.5 cents/kwh to be quite frank" (I7). Reflecting on the new competitive bid process introduced under Ontario's new Long-Term Energy Plan, another developer felt that "Ontario went from having probably the most progressive

regimes to one of the worst…..during the FIT time frame, it [Ontario] was a very good environment" (I6). On the whole, developers did not identify any glaring financial roadblocks to WED, though one developer mentioned that the cost of developing wind energy in Ontario was significantly higher than in other jurisdictions. The high cost of building projects in Ontario were attributed to the cost of crane services, concrete and steel. These higher prices were consequently linked to failed partnerships with developers in Europe.

Questions pertaining to the provision of community level economic benefits arguably generated the most intriguing set of responses. In general developers were significantly confident that providing economic benefits to host communities fosters social acceptance. In this context, one developer claimed that economic benefits "will neutralize some of the opposition if you had some payments to neighbours" [I6]. Although economic benefits within WED literature has been dominantly framed as direct payments to individuals within the vicinity of turbines, developers framed economic benefits more broadly. These included supporting organizations and charities in the communities, organizing events to support education, health and other good causes, organizing educational events and site tours for community members and contributing to the renovation and building of various facilities within host communities. In general, developers perceived the aforementioned benefits as a demonstration of 'good cooperate citizenship' rather than outright payments geared towards making communities accept developments. For instance a developer stated that their company has "voluntarily donated to local charities and so on" (I5). Developers also alluded to providing financial

support in response to requests by communities and various community-based organizations:

> …every single day…the office manager is gonna walk in here with a stack of papers [i.e., requests for support]…..and we don't even know a hundredth of stuff that comes across our desk saying will you like to support this hockey team, this community development project, and I have been in there just signing, signing, signing, here's $3000, $5000, $2000, $500 [I1]

Interviewees struggled with the idea of making direct payments to host communities and/or municipalities for several reasons, the most common of which was the idea that payments would be perceived as bribes. Few developers agreed strongly with the idea that payments to communities and municipalities represent bribe. The ability to negotiate payments with municipalities and communities without painting a picture of bribery was also attributed to the GEA creating disconnects between developers and their host communities. For example, one developer stated that "under the GEA municipalities had no power and started to see any ideas of community benefits packages that would flow through the municipality as bribe" (I5). Even in cases where developers had strong support for the idea of making payments to communities and municipalities, they still struggled with the idea of bribery. For example while claiming that it was necessary to compensate communities, one developer made the following disclaimer:

> I am not saying grease the palms…I am just saying provide something that the community needs other than wind turbines. Give them something they need. …..Its barter system back and forth and again that was taken away from the GEA, I do believe so. [I7]

Another developer claimed that in discussions with municipal counsellors about payments, councillors were "so concerned that it would look like they were being bribed so they won't ask for anything but they will accept what they are given and I understand that" (I2).

In terms of making payments to communities, developers also struggled to define an appropriate 'spatial scope' within which to distribute economic benefits. In this context the major concern was with creating a fair spatial matrix for distributing these benefits:

> When we looked at the possibility of doing money to community members within a certain distance of the project, we saw that there would be problems for us, because if it goes to everybody within a kilometer, what happens to the person that is 1.05 kilometers away? [I8]

In addition to defining the spatial scope for making payments to communities, a few developers felt that it would be difficult to define rates to pay individuals based on their relative distances to turbines. One developer also cautioned that making varying payments could compromise relationships within communities as a result of greed emerging from some individuals feeling cheated. Placing himself in the shoes of community members, he made the following assertions: "I got $200. It's really nice. The next day you go, my neighbour who is a little close is getting $400…and $200, I spent that already, all of a sudden it just doesn't become enough" [I7].

Due to mixed perspectives around the provision of financial benefits to communities, interviewees were asked to suggest potential mechanisms for providing economic benefits to communities. This resulted in two major suggestions which developers felt would be more comfortable: (1) creating opportunities for community ownership or investments in projects and (2) creating a general fund with different representatives (i.e., landowners, municipal and community representatives, various prominent community groups) who would collectively decide how to utilize funds. Some interviewees felt that community ownership would have a ripple effect of making communities feel connected to projects:

> …if we can figure out how to make it work [i.e., community ownership], it should be actual community participation projects where everybody there has the opportunity to invest, be involved and to make a good rate of return on their money… It says those are my turbines, and that is what I think the structure should be. I am not saying it should only be for the people who can afford to invest $10,000…some people can invest $5000, some people can invest….even just be members that are you know invested $10 or something….get some sort of divided off it and get to feel like they are a part of it, right [I1]

Another interviewee felt more strongly that local ownership should have been woven into renewable energy policies within Ontario, claiming that "…the real benefit is where a community owns a portion of a project either as investors or as partners on a project. I think there should have always been some requirement for ownership locally" [I4].

Considering seemingly overwhelming support for community ownership, developers were asked if they tried partnering with communities on projects. While some developers took steps to do so, others did not because they felt that the mechanisms were just not in place to support such partnerships. Even in the case of the latter, interviewees often expressed willingness to partner with communities. The variety of reasons provided for failed partnerships or the decision not to partner were strongly tied to a perceived unsuitable policy environment. While claiming that rural communities had very little experiences partnering on projects, developers felt that the complexity of some aspects of the development process such as contract documents would alienate communities. Hence, the need for roadmaps, guidelines, templates and frameworks to help communities get up to speed was identified as a bridge to successful developer-community partnerships. As well developers felt that it would be necessary to simplify various procedures to avoid overwhelming communities and municipalities:

> …there is very little experience that particularly with rural communities and what partnering really means. So it's too complex and there needs to be simpler ways to present the framework within which municipalities and communities can work to partner…but right now they've got the financial side of it, the joint venture the special entities, the legal side of it is intimidating for communities to get in the conversation [I4]

Two other roadblocks to developer-community partnerships were the lack of incentives and the fact that having too many investors would result in more bureaucratic procedures throughout the deployment process. In the case of the former, one developer pointed out that standard prices offered for all kinds of projects (i.e., big or small) under FITs have created an unfair playing field where "smaller projects are barely making it, and… the bigger projects are making huge amounts of money off it [WED]" [I1]. Hence, providing higher rates for smaller projects was seen as a means of potentially encouraging community scale partnerships, since such projects would likely be smaller. In terms of problems with having too many investors, another developer stated that having a certain threshold of partners could result in more bureaucracies and complicate the development process; hence, discouraging partnerships with communities:

> If you try to go to more than 50 investors, then you start running into the Ontario securities laws and you have to write a prospectus and get lawyers involved …It can get quite expensive and very time consuming...with less than 50 investors so you … pay out money and do whatever your plan was for them, right. [I6]

In terms of failed attempts to partner with community, major reasons which were given by interviewees included difficulties in working out financial details, the expensive nature of WED, the fact that development occurs over very long periods of time and cooperatives not being ready and willing to commit to wind power. A few developers had conducted extensive research on cooperatives within Ontario. The aforementioned challenges faced by communities and cooperatives were also attributed to the unsuitability of Ontario's policy environment (i.e., the GEA):

> So some Co-ops [cooperatives] have kind of come up in the last couple of years that are gaining traction…but in general they are in solar, they are not behind wind, and I will like to see some Co-ops that come up around wind. It's the perfect thing for a farmers Co-op. If you could get a few farmers together to do that, would be awesome…the policy doesn't really support that. …some more tools to help communities actually do this will be great [I5]

A major issue that comes up within the discourse on WED is the ability, or not, of the technology to provide jobs. As stated in the introduction, the implementation of the GEA partially driven by Ontario governments' pursuit of green jobs to boost the economy. Developers were therefore asked about the nature of jobs created by their respective projects. Within this question, interviewees were prompted to focus on the distribution (e.g., jobs for locals or foreigners), tenure (long term or short term) and orientation of jobs (e.g., administrative, technical). Most responses alluded to the fact that a bulk of the jobs provided were short term construction work. Concerning the location of workers, the interviewer was often questioned as to what he meant by 'local jobs'. In general, developers claimed that specialized individuals had to be brought in from outside to supervise the construction, since crucial technical details could not be compromised. However, all developers interviewed made it a priority to employ individuals living as close to their respective host communities as possible. As well, they were sure to utilize services closest to host communities (e.g., printing logistics). While the total number of individuals who were employed was in some cases as many as 400, the number of permanent jobs were as low as 10. Developer responses to the nature of jobs are captured in the following quotes:

> Well other than specialized crew, like specialized crane companies that had to be brought in…like general labour truck drivers, forming people….construction workers, we had them all local. We hired everybody in the community who wanted to work. We probably had say a couple of hundred people working for us….We use local talent as much as we can. In fact we have a mandate for myself and companies: "don't bring anybody out of town, you have to use what you've got in

> the area", and I've got a great pool of resource men in the area so I am good to go…. [I7]
>
> I have always had local people involved particularly on road building because it tends to be local road builders and aggregate suppliers in almost every area. They've been involved in foundation excavation at least, the building of the foundations I have had local concrete people, but they tend to work under the supervision of people who've done it for wind turbines because you need to have your foundation done right, and so those would be the truly local…but I guess it depends on what you call local….err…..its within 100km's. [I6]

Developers generally felt that the jobs they were providing were having a positive economic impacts on host communities by providing opportunities which wouldn't have existed in the absence of WED.

4.4.3 Impacts of environment and wildlife factors on developer experiences

Under the environment and wildlife theoretical frame, questions were asked about environmental risks and benefits associated with WED. Specific to the former, developers were also asked about impacts of turbines on birds and bats and the steps they have taken to curb them if any. Additionally, developers were asked about the efficacy of environment and wildlife assessments.

In response to an open ended question on the environmental impacts of WED, developers came up with both positive and negative impacts of the technology. In general the major benefits of wind energy that emerged were climate change mitigation and low emissions generations. In terms of climate change mitigation, some developers cautioned that wind was not an 'ultimate solution', but rather, a contributor to GHG emissions reductions. The major environmental challenges identified included the decommissioning of projects (specifically, the non-recyclability of blades), the relatively short lifespan of projects and bird kills. Some developers noted that towers could be recycled. While acknowledging the complexities of environmental discourses surrounding WED, some

developers felt the urgent need for societies to have discussions on the merits and demerits of various energy generation technologies and make collective decisions on the best direction(s) to take. This is noteworthy because, although developers were not explicitly asked about public discourse around energy, they felt that these discourses often treated wind power unjustly:

> At some point society has to make a decision. They have to say how we are going to get our power because it's not a question of wind or nothing. Its wind or something else….would you like wind or no wind or we will do it all with natural gas okay so you are okay with fracking right, you are okay with doing some fracking in your backyard okay…have we figured out what to do with the nuclear waste yet, are we sure that terrorists can never get their hands on that stuff? The people of Fukushima might have a very different viewpoint right? Are we okay with burning coal, do we not think climate change is a big issue? [I6]

Interviewees were also asked about their thoughts on the rigour and effectiveness of environmental assessments prior to developments. Overall, they felt it was a rigorous process spanning between two and four years, involving procedures such as migratory assessments for birds, archeological studies and a host of other assessments. Nonetheless, some interviewees were of the view that wildlife assessments in particular were either bureaucratic, unnecessary or a result of governments' lack of understanding about wind energy. One developer retorted that the cumbersome assessment process was likely established due to the negative hysteria around the impacts of turbines on birds and bats. While stating that turbines had minimal impacts on birds and bats, multiple developers felt that hefty resources invested in post-development assessments (i.e., counting avian mortality) could be used to sponsor research aimed at better understanding bird and bat behaviours and minimizing the impacts of turbines on avian species:

> In my view, our money will be much better spent doing much better studies that are organized by universities and other places…..I would rather have them [researchers] go out there and figure out the nuances of when they [birds & bats] get killed, where they killed, how they get killed so we can reduce it as an industry.

> You know what the solution is, if we find that we are killing more birds, more studies, so we hire someone on for another three years to keep counting. I will rather find solutions, rather than just counting problems [i.e., post development counts of bird mortality which developers have to pay for]. You know. [I8]

In response to questions about the impacts of turbines on wildlife, most developers acknowledged the occurrence of bat mortality on their development sites. Others expressed concern about wildlife impacts being trivialized by the anti-wind community and media outlets in Ontario. For example, they claimed these groups referred to turbines as "slicing dicers" [I3] and mulcher of birds as well as claiming "wind turbines send vibrations to the ground that affect earth worms populations" [I1], which one developer felt was very unreasonable. Overall developers were of the view that turbines were having minimal impacts on birds and bats. This claim was usually supported with research, the fact that avian mortality was far below Ontario Ministry of Environments' thresholds for bird and bat kills per turbine and the idea that other environmental sources of bird mortality were far worse than the damage done by turbines. Developers acknowledged that the mortality of birds is closely monitored by the Ministry of Environment. As a first response to the problem of avian mortality, most developers deferred to research suggesting that turbines had minimal impacts on birds: "when it comes to birds, a lot of time, what I like to rely on is scientific data.…it really speaks to the fact that wind energy is not having any significant effects on birds" [I3]. Specific studies cited included a report from Environment Canada [e.g., I2, I1].

Developers felt that wind turbines are one of the least sources of bird and bat mortality when compared with other risk factors such as accidents with cars and buildings and diseases (e.g., white nose syndrome in the case of bats). This seems like a discursive attempt to minimize impacts of turbines on avian species. They also felt confident about

minimal impacts of turbines on birds and bats because in all cases, they were far below regulatory threshold of permitted bird and bat kills:

> ….we have a 93m diameter rotor spinning 260 feet up in the air about 16 RPM….we are going to hit things, of course we are. I'd be a blunt liar if I told you we weren't. But the ministry watches us very closely.…Our ministry watches the mortality rate, we've had environmental companies come to our site an arm's length away from us and they've gone through the site three years after every day….every month we ask how we are doing…are we good? The ministry came back and said you guys are so far below the limits… [I7]

A suggested mechanism for mitigating wildlife impacts was to shut turbines down during critical time periods such as migratory periods of the year and during times of the day when massive numbers of birds fly through wind parks. Some developers acknowledged utilizing these practices within their sites.

4.4.4 Impacts of turbine health impacts on developer experiences

The wind turbines and health theme is a highly charged issue in the sector. Developers were asked about their perceptions of wind turbine health effects, the way they handle health complaints and the extent to which they feel health complaints are legitimate.

Most developers first acknowledged that they were not health experts. Hence, their decision to rely on peer reviewed scientific literature on the subject. To varying degrees, all developers possessed an appreciable depth of knowledge on scientific studies addressing the health effects of wind turbines. They were therefore confident that wind turbines were not negatively impacting the health of host communities. Studies conducted by Health Canada, Massachusetts Institute of Technology (MIT) and diverse studies conducted in U.S, Japan and Australia are among numerous examples that developers drew from:

> We had our federal government obviously hearing those concerns [health concerns] and taking it upon themselves to do a very significant study … and found that there is not significant impact to health…Even more recent than the health Canada study results was the world's most extensive literature review that was conducted by MIT [The Massachusetts Institute of Technology].…they had their findings peer reviewed that showed that there is not data out there that demonstrates negative impacts on human health. …we can say with a very high level of confidence that individuals are not impacted by wind energy turbines from a health perspective. We will continue to take a look at that research as it comes out and take the concerns seriously [I2]

Despite developers being confident about turbines being safe based on scientific literature as demonstrated in the previous quote, others felt the need to keep a close eye on continually emerging studies, since new evidence proving that current standards are not safe would require going back to make significant changes to existing projects. Hence, reliance on studies and existing standards were in a few cases deemed as a risk developers take. Others further noted that health is a complex phenomenon; hence, acknowledging that the idea of outliers (specifically, a small subset of individuals with pre-existing health conditions) experiencing negative health effects from turbines could not be ruled out:

> So again I acknowledge that just like people who are walking beside a road, they may be impacted by exhaust, and some people might be more sensitive to that because of some kind of congenital conditions they may have with breathing and that. So they may be people in areas where turbines are located that might be particularly sensitive to some aspects of it. But the percentage of the population is so minuscule ….but their concerns need to be addressed, but not to a point where the project has to stop. [I4]

> Nothing is impossible, I am sure somebody out there in the masses has a problem with differential air pressure or maybe some type of motion problem when they watch things spin. You know, I just haven't seen it. I just have not had people coma around and complain. I have never had any health complaints, zero, zero complaints in my experience [I7]

As evident in the previous quote, some developers had never been confronted with health complaints within host communities. However, others were confronted by some residents with health complaints and/or concerns. There was consensus among developers

that health complaints should always be perceived and treated as legitimate. For instance one developer stated that "I will never say that turbines don't impact some people in some ways that are negative. I absolutely wouldn't say that, right. Sound pressure exists and sound exists" [I5], while regarding another project, another developer stated that feedback around safety was always promptly addressed during the development phase, claiming that their company "had ongoing discussions with the municipality and addressed their concerns [specifically, pertaining to health]. So I think it led to a better project for sure" [I8].

Despite the consensus that health concerns should be treated as legitimate, one developer provided an example of an instance where he felt health concerns were invalid. After checking his records, he recalled that two neighbours were responsible for all but two out of approximately 50 health complaints within the host community. Previously community members informed the developer that those two neighbours had been circulating flyers asking individuals to call in with health complaints. After several discussions with one of the two neighbours, she explicitly stated that she would do anything to stop the project. Regarding this occurrence, the interviewee made the following statement:

> Do I consider those valid complains? No, I don't. When I hear from somebody else, we do everything we can to try to mitigate their concerns, but the fact is we are not getting complaints from everyone else, even though people are getting flyers in their mailbox saying these things [turbines] are horrible, here is all the bad things going on and here is the number to call, I still don't get calls. [I1]

Some interviewees were of the view that negative messages around wind turbine health effects from neighbours who opposed developments and the wind energy resistant movement in Ontario were actually making people sick. Within these discussion, health

impacts were generally framed as an initial psychological impact, which could result in pathological manifestations of poor health:

> ....so I had a woman who was several KM away [from turbines], and she was being told that she was gonna have all these issues, and I could tell she was genuinely worried about it...I looked at where her house was, I looked outside and I said to her, even if you go to the anti-wind person, you are outside of the 2km setback that they suggested, so even if you don't take my word for it, take the word of the person who hates us that you are outside of this, you can feel safe….. I never heard from her again, never another call never another word…..never another comment……[I4]

Based on controversies and uncertainties surrounding wind turbine health effects developers provided multiple examples of individuals demanding diverse resources following health complaints. Though developers did not frame such events as extortion, insights provided into these occurrences suggests that such individuals were trying to take advantage of developers by claiming their health was being compromised. More generally, one developer stated that there have been multiple instances where some individuals have seen turbines in their community and assumed that developers have money, resulting in such individuals making up health effects with the aim of obtaining money from developers [I7]. Two developers provided concrete examples of such occurrences within their respective projects. In the first case, a family who lived approximately 1.5KM from a turbine complained that one of their members' health was being affected negatively. After discussions with the developer, the family demanded a bed costing $1,700, claiming that will solve the health problem. After probing if the developer made the purchase, the response was "No! We ended up saying no we are not going to buy a bed" [I6]. In the second case, a developer voluntarily offered to conduct minor renovations on a house for a family that complained of noise from turbines. After demanding an invoice for the maintenance work, the household returned with a $30,000

bill which included numerous and major renovations that hadn't been previously discussed [I5].

4.4.5 Impact of technical factors on developer experiences

Technical questions focused on grid integration, issues with turbine technology and the way wind power compares with other energy generating technologies. The ability of wind to replace traditional energy generation sources (e.g., coal) and satisfy Ontario's present and future energy security needs was also probed.

As a segway into questions about the technical aspects of wind power, developers were asked to reflect on how wind power compares with other renewables. Despite being technically oriented, this question in most cases resulted in the in-depth discussion of the cost effectiveness of wind relative to other energy generation technologies. Amidst these discussions, developers were concerned about the unfair comparison of wind to other generation technologies such as nuclear, which they claimed were usually characteristic of public and media energy discourses. One major area of concern was the comparison of energy deployed in different eras:

> …wind is one of the most competitive forms of new electricity you can get today. Again we are comparing new to new, a lot of people will say oh well, in Ontario nuclear fleets can produce electricity at costs of less than 6cents/kwh. It is an unfair comparison because it will be an equivalent of you comparing the cost of running your grandfathers hand me down Cadillac that he gave to you when you were 16 and the cost of you going out and leasing or financing a brand new Honda civic. You can't compare them because one was bought and purchased and paid off years ago, whereas the other is something that is a new investment [I3]

In the few cases where more technical details were discussed, developers focused on the complementary nature of different renewable energy technologies instead of

making explicit comparisons. Specifically, they highlighted the efficacy of combining wind, solar and hydro power.

Developers were then asked questions about technical barriers faced in the deployment of wind. Regarding wind turbines, developers acknowledged that there were earlier issues with reliability, efficiency, performance, design and generation capacities. Nonetheless, there was consensus that these were issues of the past that have been ameliorated by technological evolution and hands-on experiences building wind farms:

> Ya, I think actually we have learnt from our mistakes. So if you build one or two wind farms, the first one is always the best guess, the second one is usually better from the first …It [wind turbines] is like a new iPhone or something. Every year something new comes out, better performance, less noise reduction, slow rom of the blades, more output with less noise…there are so many different things coming out [I7]

> … I think a lot of the technical issues have been solved. So what's been happening is that the turbines have been scaling up, the towers are going up…you know it's not uncommon to have 100m towers now…when I started in the business they were 80m, and when you go to 100m, you are into better winds so you have better output per turbine [I6]

Technical barriers were discussed in relation to deficiencies in grid and transmission infrastructure needed for wind power to thrive. Thus, rather than technological barriers associated with wind turbines, respondents felt that the biggest technical problems they faced were infrastructural in nature. Rather than objective technical obstacles, these infrastructural deficiencies were further linked to administrative problems that resulted from adamant grid management and transmission bottlenecks:

> When I look at technological barriers, they are actually structural barriers, in that when I want to deal with renewable energy integration, load shifting whatever else, I have to integrate it into an existing grid, there is an existing context that it has to be integrated into, and that context is very set in its ways. It is designed around a centralized generation source……and what you end up with is that the grid is very very slow to change [I1]

> Denmark is reaping the benefits of a very very strong transmission system that allows them to move power around when they need it…because if you have sufficient transmission, you are able to move that power without constraints, and we were facing in North America some bottle necks around transmission. [I3]

Since the variability of wind has often emerged as an argument against the technology, developers were asked if it represents a challenge. Although there were no explicit acknowledgements that variability poses a challenge, few discourses subtly suggested so. In this context, one developer asserted that "it's not a challenge. It's exactly what it is, every technology has its challenges…spent fuel rods for nuclear. Ours is what it is so it's the wind" [I7], while another asserted that "It's not a problem so long as you have the right tools in your toolbox to deal with it" [I6]. Another common thread was the idea that variability is not a current problem because wind energy only contributes a small percentage of Ontario's total energy supply. Developers therefore suggested that "once we get into the higher levels of penetration" [I1], variability could become an issue depending on that nature of infrastructure:

> …..the arguments about the intermittency are valid if we were trying to get 50 or75% of our power from wind. They are largely invalid at the percentages we are getting from wind today. [I6]

Two interviewees were of the opinion that variability has always been a characteristic of the energy system, with one referring to the fact that "the [electricity] system already has reserves and all sorts of different reserves to account for times when supply and demand are not equally matched…spinning reserves existed long before wind energy…" [I3]. Developers provided in-depth insights on the mechanisms through which intermittency could be embraced. These included integrating wind with other technologies such as dams or natural gas such that "when the wind isn't blowing you either let the water through the dam. If you don't have any water in the dam, then you

burn natural gas" [I6]. Multiple interviewees were confident that the advent of storage would positively impact the way variability is handled. One interviewee for instance expressed excitement about the government of Ontario putting up requests for 35MW of storage power [I4], evident in the Province's long term energy plan. Another suggested mechanism for handling variably wind supply was through the use of wind forecasting and major upgrades to grid and transmission infrastructure. This perspective further affirms developers' perspective that challenges faced in WED are more rooted in the structure of Ontario's energy system rather than the technology itself:

> Texas is a great example where in fact it was the transmission that was causing their system operator to actually reduce wind output because they couldn't move it. The other tool they brought into the mix was forecasting [wind speeds]….this notion of saying what is the wind gonna be like the next hour and how accurate am I with that forecast, and as time has evolved, they've become much more confident and much more accurate in their forecasts so they could manage the system with knowledge of what is coming up around the corner. They did a few other things as well. [I3]

Developers were generally satisfied with the capacity factors of their respective projects, which generally ranged between 32% and 35% [I6, I7, I2].

4.4.6 Impacts of aesthetics on developer experiences

Questions on aesthetics probed developers' perceptions about the look of turbines and impressions about the legitimacy of aesthetic concerns. While acknowledging that aesthetics is very subjective, most developers felt that turbines themselves were not visually appalling, with some noting that they received positive feedback from some individuals within their respective project communities regarding the attractive look of turbines. Within most developer discourses, aesthetics transcended the physical look of turbines and embodied the value turbines add to society (e.g., climate change mitigation). For example, one respondent stated that "a wind turbine is a symbol of hope, it

contributes to hope for the future of the planet" [I3]. Similarly, another respondent stated that turbines "are very beautiful, especially when you understand that the immense resource that each single one turbine can produce…it creates electricity without emissions" [I2]. A few developers felt that while aesthetics rarely comes up as a major community concern or usually gets lumped with other concerns such as health, it could be an underlying motivation for resistance, which is not vocalized because "it doesn't give people a very strong argument" [I1] or because it is not regarded as a "winning argument" [I6].

Developers generally agreed that aesthetic concerns are a valid kind of concern. For instance, one developer acknowledged the fact that communities may find it difficult to accept turbines due to place attachment, stating that

> ….change is hard. For someone to have an issue with something in their backyard is valid, right, it's where you live, it's where you grew up. It's a place you picked because it looks and acts a certain way" [I1].

While there were variations in perspectives about the look and visual impacts of turbines, there were three major negative aesthetic impacts and impact mitigation strategies that were discussed by interviewees. These issues were centered around scale (i.e., number of turbines), the nature of landscapes chosen for developments and the features of turbines (look, color, flashing lights, etc).

Concerning the scale of developments, some respondents were of the view that some individual communities tend to have too many turbines. This cluster of respondents sympathized with individuals who may be overwhelmed by the massive scale of some developments. Within these discourses, there were calls for smaller projects across several communities instead of having numerous turbines in individual communities.

Since slight changes in rotor sizes could result in very significant increases in the power generated per turbine, one developer suggested that turbines with bigger rotors be used, since that would result in more power being generated with less turbines. Concerns about the scale of development are exemplified in the quotes below:

> They [communities] haven't liked it [turbines], I think that is the main issue, just the fact that it is not community scale. …..When you have hundreds of turbines that are spinning in the wind in the horizon, I think like anything else it's kind of like the war of the worlds. Ever see the movie with the kind of alien structures…they are marching across the landscape. That is kind of what it feels like sometimes. So no wonder you have residents and communities locally reacting to stuff. So it needs to be things that are much more community scale you know…20MW of something which will be 10 turbines in places across the province…not hundreds of them located in one area which is what is happening. [I4]

> I think part of the issue is how big our projects are. Lots of projects are just too big ….why do you need to do 60 or 50 or 40 [turbines]. Can we cap out in some areas can we save in the number of turbines. In just about everything I can think of "let's do absolutely everything we can to capitalize on this is generally not the road to sustainability. How do you measure sustainability? Part of that is what you do in communities. [I5]

A number of developers felt that some landscapes may possess aesthetic values that make them unsuitable for WED. For example, one respondent expounded that "there are certain mountain ranges that maybe should be left alone, certain special spots that should be left alone. I do agree with that…." [I7]. While developers largely acknowledged that they could do nothing to satisfy individuals who complain that they don't simply like the look of turbines, they suggest ways to make turbines more visually appealing. For instance, it was suggested that turbine tower and blade colors could be altered to "be more responsive to the environment they are going into" [I1]. Others felt that mechanisms were currently being put in place to ensure that turbines blend well with host landscapes. Of note is their expressed preference for certain type of turbines (i.e., the feet, color, blades and hub structure).

Other major aesthetic concerns that emerged included beeping red lights from turbines and the importance of a good maintenance culture to ensure turbines look visually appealing. Concerning the former, one developer stated that he personally found the beeping lights very irritating, likening them to a "strobing heartbeat" [I2]. Nonetheless, he acknowledged that the wind industry has no control over the lights, since they are part of the regulatory requirement. A few other developers expressed similar sentiments about the beeping lights. In terms of maintenance culture, one developer mentioned that it is very important to keep turbines clean, stating that sometimes "the blades get dirty, then instead of that pearl white look it looks dirty and unkempt"; hence, sites look more visually appealing when developers "keep the towers clean, don't allow all that grease to go down the tower and keep the blades clean" [I7]. As mentioned in the previous quote, the importance of keeping turbines clean was mentioned by a few other developers.

4.4.7 Other key factors which impact developers (post development and media coverage)

Within existing literature on the social aspects of WED, studies on the way developers relate with communities post- development are nonexistent. Developers were therefore asked if they utilize any post-development strategies to understand the way communities coexist with wind energy projects. None of the developers interviewed had strategies for actively reaching out to communities to find out how they were coexisting with turbines. Nonetheless, they all alluded to constantly keeping their doors open to receive community concerns and complaints. After probing further to understand why they utilized more passive forms of community engagement (i.e., waiting to be approached with concerns) rather than actively reaching out to communities, some felt it

would seem like looking for trouble, while others were of the view that the presence of complaints would result in the need to satisfy various bureaucracies. Both responses are captured in this quote from one of the respondents:

> In the post construction phase, in the commissioning, in the operational phase you are not going out and talking to people because that starts to look like going out and looking for trouble. So one of the things that I thought about during the week we were commissioned was to go out and talk to people along the road and say, so how is it going for you? Then I realized that any negative comment would trigger a report to the MOE, that I would have to make a report to the MOE, and that we would have to follow up on it and that it would take hours of administration work, because it would also involve looking at lots of information and collecting greater details and back and forth for a conversation that will ultimately end in what?… [I5]

While a few developers felt a post development strategy for monitoring community coexistence with turbines was unnecessary, a number of developers felt that such a strategy would be beneficial to both developers and the wind industry. One developer suggested that it could be woven into the policy requirements.

Since themes from a longitudinal media content analysis were used to design interview questionnaires, we were interested in understanding developers' perspectives on media coverage of WED in Ontario. Developers were therefore asked about their perspectives on media coverage of WED in Ontario. With the exception of one developer who felt that media coverage within their host community of operation had been 'mostly factual' and 'fairly balanced' [I8], all other developers expressed extreme frustration with media coverage on WED. It is also noteworthy that these frustrations were a recurring theme throughout the interviews.

Regarding negative media effects, developers were concerned about the media creating a backlash through inaccurate messages on the technology and the economics of

wind power in general (e.g., prices offered under FIT's, the cost of the technology, property value impacts), creating a negative impression about developers, sensitizing the issue of wind turbine health effects. One developer for instance referred to the media coverage as "propagandistic and disgusting" [I6] while another developer referred to the media as "incredibly anti wind" [I5]. A few developers were of the view that the media is one of the biggest challenges in the way of the wind industry, while others stressed that they have taken steps to even hide positive events within their host communities from the media. The aforementioned concerns and frustrations with the nature of media coverage are demonstrated in these quotes:

> I have read some stories in there I still remember just seeing the front page one time and they were talking about how the allegation that wind energy is too expensive. And they were saying that wind energy was being paid 80.2 cents/KWh. Which at the time was the price for small solar installations on your roof top. So wind energy…I mean I will tell ya, if you make 80.2 cents/kwh I can do very well in the wind business (laugh). You and I could be having this conversation on our yachts in the Caribbean… [I6]

> You know baboons come to mind, morons, people who can't listen properly. You know, if they got their butts out of controversy and brought some good news once a while, they might actually have more things to write about. We hear things like "turbine catches on fire or something like that" which of course is news worthy too…but let's have some good stuff, let's get some accurate reporting in place, let's get…I've dealt with the media ….oh my God, I get headaches after they leave…..I can't even think of one positive media interview I have had that I have actually enjoyed reading the results. I have to think about that for a bit…so it will be nice to look at the good side once a while… [I7]

As a closing question, informants were asked to reflect on the future of wind energy in Ontario. Overall, most developers felt that the rate of deployment would slow in the near term compared to the period since the GEA was enacted. Yet a number of developers also mentioned that the advent of energy storage in Ontario would open doors for more projects to be developed. Some developers were confident that greater social acceptance would come around with time. Reflecting on the more distant future, some developers

suggested that wind could eventually become a baseload; hence, creating a dominant renewable energy regime.

4.5 Discussion

The discussion highlights key findings that emerged within developer interviews as they relate to existing literature which seeks to understand WED through the lens of developers, communities and the examination of other independent issues such as technical and environmental factors.

Findings within the political frame reveal that Ontario's GEA has created both opportunities and challenges for wind energy developers. While FITs were successful in attracting developers and making them successful, the elimination of community and municipal control over projects created several challenges for developers. The role of public participation in fostering social acceptance and consequently, the success of WED, is a recurring theme in the literature (e.g., Gross, 2007; Devine-Wright 2005, Loring, 2007; Haggett, 2008). The present study here indicates that public participation is key to the success of developers.

The GEA's elimination of municipal and public participation in the development process has created major disconnects between developers and communities hosting wind energy projects. Some developers have therefore had to transcend regulatory requirements for community engagement, which they perceive as insufficient. As identified by developers, another roadblock to community engagement is the general lack of incentives for public engagement in the development process and/or ownership. There is an obvious need to revise regulatory requirements around community engagement to

ensure that communities engage more deeply with developers. Additionally, this engagement should occur earlier in the development process prior to hefty investments by developers to ensure that developers are not focused on protecting their investments instead of engaging communities to the full extent possible.

By reducing risks for the wind industry, FITs have been found to provide energy developers with longstanding financial stability (Sijm, 2002) and "the kind of certainty investors crave" (Davies & Allen, 2014; 938). This is consistent with several studies that have sought to understand drivers of successful WED among developers (Luthi & Prassler, 2011; Friebe *et al*, 2014; Lam *et al*, 2013). Based on the findings of the current study, the same can be said of FITs under Ontario's GEA. Literature indicates that community (co-)ownership of WED fosters social acceptance (Warren and McFadyen, 2010; Dinica, 2008). Interviews conducted within the current study reveal that financial incentives such as FITs could be used as an incentive for developers to engage communities in the part ownership of projects. On a more practical level, this could be achieved by either providing more attractive FIT contracts for community owned projects or reducing FIT rates for developer owned projects. Additionally, the simplification of the application and assessment process for community owned projects could encourage developers to engage in partnerships with communities, as developers feel that the complexity of these processes could potentially overwhelm and alienate communities. To help make community owned projects a more attractive venture, simplified procedures and fast-tracked approval processes could be made exclusively available to community based projects.

Several studies have suggested or hinted that the provision of economic benefits for communities hosting projects fosters social acceptance (Toke *et al*. 2008, Aitken, 2010; Cowell *et al*, 2011). However a few studies have further highlighted the complexity of providing economic benefits, e.g., in a study of multiple renewable energy stakeholders, Cass *et al* (2010) indicated that there were concerns about the provision of economic benefits being perceived as 'bribery' or even dividing host communities. Further, Songsore and Buzzelli (2014b) have also highlighted that economic benefits may result in communities internalizing negative experiences with turbines. Within the current study, developers were similarly concerned that economic benefits would come across to communities as bribes or act as a community splitter. They also alluded to municipal authorities feeling economic benefits would be perceived as a bribe. Developers struggled with spatially delineating who is compensated and by how much. Nonetheless, developers took the initiative to support their respective communities in diverse ways (e.g., donating to local charities, supporting events, hosting fundraisers for health and education) as well as ensuring that individuals within host communities were the first to be employed. These forms of economic benefits to host communities were general framed as corporate citizenship, and should continue to be encouraged.

As suggested by informants, the best remedy to controversies around economic benefits might be putting structures in place for communities to be part owners of projects through investments. Considering complexities generated by the idea of providing benefits through direct payments, this seems like a more effective mechanism of ensuring communities not only benefit from projects, but also develop a sense of attachment to developments. With such a model, the level of individual investments will determine the

value of returns. This could consequently eliminate the perception of bribery, help avoid conflicts that could stem from unfair payments to different neighbours and also help avoid the challenge of defining a fair spatial scale within which to make payments. Additionally, developers should continue to be encouraged to act as corporate citizens by sharing in their successes with host communities. These remedies will require transcending the simplistic view of economic benefits as direct payments to host communities. As suggested by developers, the availability of tools for communities to engage in part ownership is also critical. As literature suggests, the presence of strong policy support for WED motivates wind energy investors and contributes to the success of developers (Friebe *et al*, 2014). Based on interview responses, clear policy instruments for community ownership and the minimizations of bureaucracies (e.g., overload of paper work when multiple investors are involved in projects) are also needed to encourage community engagement in the form of ownership.

Regarding environment and wildlife impacts of turbines, developers acknowledged that turbines were responsible for a few bird and bat deaths. Nonetheless, they felt the impacts of turbines on birds and bats was minimal, since mortality from other sources (e.g., diseases and birds flying into buildings and cars) far outweighed impacts form turbines. Within ecological based literature, mortality caused by wind turbines has been documented in several jurisdictions such as Belgium (Everaert & Stienen, 2007), US (Evans, 2014), Canada (Baerwald *et al*, 2014). Within North America in particular, which encapsulates the current study region, avian mortality from turbines is most prominent among bats (Cryan *et al*, 2012). Arnett and Baerwald (2013) for instance noted that

approximately half a million instances of bat mortality have been documented in the US and Canada alone.

To help mitigate bat mortality, various jurisdictions have set thresholds for kills per turbine. Arnett *et al* (2013) have stressed that most of these fixed thresholds are not rooted in scientific evidence, citing Ontario and Pennsylvania's respective mean annual thresholds of 10 and 28 bats per turbine. While developers acknowledged staying below Ontario's thresholds, the expansion of wind energy will imply greater impacts on avian species. As suggested by developers interviewed, merely counting and monitoring mortality does nothing to minimize the impacts of turbines on birds and bats. Hence, funds used for such activities could be channeled towards studies to better understand the behavior of avian species around turbines and device ways to minimize impacts. A suggested mechanism for effectively mitigating avian mortality is to shut down turbines (Caruso *et al*, 2013). For example, in a Pennsylvanian wind farm, shutting down turbines between July and October in 2008 and 2009 during periods when wind speeds were below 6.5 meters per second resulted in the reduction of bat deaths "by 44 to 93 percent, with less than 1 percent annual power loss" (Drouin, 2014; 29). While similar strategies could be employed in Ontario, more studies are needed to understand the intricacies of avian mortality and gain insights into potential mitigation strategies. Thus, despite low levels of avian mortality relative to other causes of bird and bat deaths, this problem should be treated with urgency, as Ontario looks to continue to expand wind energy production.

Health concerns remain a major determinant of wind turbine support in Ontario. Baxter *et al* (2013) have, for instance, identified health risk perceptions as a key predictor

of turbine support in Ontario. Despite the presence of a strong wind energy resistance movement in Ontario battling turbines partly because of health concerns (Songsore & Buzzelli, 2014b), some developers interviewed in the current study were not confronted with health complaints within their host communities. While a direct cause-effect relationship between turbines and human health, there is general consensus that wind turbines may cause annoyance and sleep disturbance in some cases (Pedersen and Waye, 2007; Bakker *et al*, 2012; Onakpoya *et al*, 2015).

Furthermore, a major finding that emerged within the health frame is the fact that some individuals, through health complaints, made various types of compensation demands of developers (mainly in the form of resources that require developers to incur economic costs). Although these 'health complaints' backed by financial demands cannot be dismissed, they partially reinforce the importance of community ownership, since they may be rooted in communities feeling like they are not benefiting from developments. Developers interviewed did not rule out the possibility that some individuals with pre-existing health conditions could be negatively impacted by turbines. This highlights the importance for post-development policies and practices to guide developers in the handling of such concerns, as existing policies mainly focus on processes up to and including development. All developers interviewed acknowledged having an open door post- development policy, nonetheless, none of the interviewees engaged in active post development strategies for listening to and addressing community issues.

While developers were not of the view that the intermittency of wind power is problematic, several studies have found intermittency to be a roadblock to wind energy development and investments (Richards *et al*, 2012; O'Keeffe & Haggett, 2012). Further,

Dedrick *et al* (2014; 63) suggest that "intermittency of wind imposes costs on the utility companies that distribute wind energy because they must ensure the availability of adequate alternative sources of supply for times when the wind doesn't blow". Specific to the current study, developers identified grid integration as a challenge. Nonetheless, the roadblock identified in this context were more linked to administrative challenges around grid management. Based on existing literature that suggested that utilities face higher costs when integrating wind power into existing grids, the administrative barriers that developers identified could be potentially triggered by the high cost of upgrading grid-based infrastructure rather than objective failures in grid management and administration.

Several studies have found aesthetics to be a major predictor of wind turbine support within communities hosting projects (Lothian, 2008; Lange & Hehl-Lange, 2008). For example, Wolsink (2000; 51) asserted that attitudes towards wind turbines were most impacted by "the perceived impact on scenery, visual intrusion of the landscape as well as positive judgments". Developers generally did not find turbines to be visually unappealing in themselves. However, some developers were of the view that some landscapes of aesthetic value should be avoided, while others contended that projects with too many turbines compromised the aesthetics of landscapes. Further, some felt that some turbine brands were more visually appealing than others. Similar perspectives on the aesthetics of wind turbines have emerged within studies of community responses. For example, Lothian (2008) revealed that individuals preferred certain colors of turbines, further revealing that it is also important to avoid landscapes of aesthetic value. Thus, developers are not very different from communities in the way they think about the aesthetic impacts of turbines.

Findings within the aesthetic frame further reinforce the importance of community engagement in the development process to help avoid areas of scenic value and ensure that the aesthetic preferences of communities are incorporated into the development process as much as possible. One mechanism that has been successful in ensuring that the aesthetic preferences of communities are integrated into the development process is Geographic Information Systems (GIS) based visualization and planning (see Aydin *et al*, 2010; Van Haaren & Fthenakis, 2011).

Developers interviewed in the current study felt that the media in Ontario was doing them damage by corrupting the public with negative and inaccurate information about wind energy companies as well as turbines and their impacts. This perspective is supported by earlier media analyses. Songsore and Buzzelli (2014a; 11) for instance have found that post-GEA media discourse in Ontario "highlighted the potential impact of the GEA in fuelling negative health, and aesthetic, environmental and wildlife, political, economic, and technical impacts of wind power". Through media analysis, Deignan *et al* (2013) similarly concluded that Ontario newspapers contained fright factors about the health impacts of turbines which could trigger fear among readers. As wind energy development possesses both merits and demerits, there needs to be more balance in media coverage on the technology in Ontario.

While the results presented here reveal a variety of roadblocks and successes encountered by wind energy developers in Ontario, existing policies and regulations around the deployment of wind power seems to be the greatest barrier faced by developers. The GEA and its associated regulations have created a landscape

characterized by poor community engagement, the absence of community ownership, infrastructural roadblocks and a system that is riddled with bureaucracies.

In addition to unearthing the complex nature of wind energy developer experiences in Ontario, the current study highlights the need for improved policy approaches. Ontario's Long Term Energy Plan (2013; 4) seeks to "balance the following five principles: cost-effectiveness, reliability, clean energy, community engagement…." The developers rightly identified the need for tools to help communities engage effectively in the development process and even hold developers accountable for their actions. For example, the concept of 'community' emerged as a contested concept within the economic and political frames. Additionally, engagement was discussed in different contexts including the collectiveness of decision making and community ownership. Policies guiding developers therefore need to provide detail and clarity regarding what constitutes 'community' and sufficient 'engagement' as well as other key guiding principles within policy instruments. In the absence of such clarity, policies will remain vague instruments that create confusion for developers and compromise their relationships with host communities.

4.6 Conclusions

The current study opened up by reviewing literature on the factors that impact WED and policy outcomes. The literature review revealed the dearth of research on the factors that promote or hinder the success of wind energy developers, especially when compared to literature on the social aspects of wind power. Regarding the former, the focus has predominantly been on understanding how developer success is impacted by

political (i.e., policies), economic and technical factors. The present study addresses this with an integrated social theoretical framework to understand how a multiplicity of interdependent factors shape WED and policy outcomes in Ontario.

The study highlights the utility of integrated frameworks and more holistic approaches for understanding roadblocks and hindrances faced by wind energy developers. Specifically, the current study finds that multiple aspects of WED work in complex and multifaceted ways to determine deployment and policy outcomes. For example, the findings reveal that a remedy to a political problem such as public participation and ownership potentially lies in an economic solution such as restructuring FITs to make community based projects more attractive. As well, findings show that technical roadblocks (i.e., grid based problems) are seen to be rooted in political problems (i.e., grid based management and administration), while wind turbine health effects are shown to generate economic responses in the form of some individuals making compensatory demands of developers. Thus issues imbued in the WED process often transcend the six theoretical frames used here to analyse Ontario's experience. As well, the study highlights the utility of longitudinal content analysis in interview questionnaire design, as the questions resonated strongly with developers and resulted in the unearthing of major roadblock and successes faced by developers.

Finally, the study highlights the need for better community engagement in the wind energy development process and potentially the ownership of projects. It also highlights the need for detailed and clear policy instruments to guide both developers and communities and enable them engage each other more effectively. Administratively, the management of transmission infrastructure and grid related issues needs to be less rigid

and more forward-thinking in order to create opportunities for the effective integration of wind power. Finally, measures should be taken towards the practical minimization of avian mortality and the implementation of post development strategies for monitoring community wellbeing post-development.

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CHAPTER FIVE

Summary and Conclusions

This chapter presents a summary of major findings from this dissertation. It also discusses the theoretical and methodological contributions of the dissertation to our understanding of wind energy deployment and policy. The implications of the study findings for policy and practice are also discussed. The chapter then concludes with an acknowledgement of various study limitations and some suggested directions for future research.

5.1 Introduction

This research sought to explain wind energy deployment and policy outcomes in Ontario by examining the role of the media in influencing public perceptions of wind power and roadblocks and successes frequently faced by wind energy developers. In addition, the dissertation provided three methodological roadmaps for assessing WED through media analysis. Research within the social sciences and a host of other disciplines has exposed the depth and breadth of factors that impact wind energy deployment in different jurisdictional contexts. Nonetheless these individual clusters of literature have often focused on one of two major wind energy stakeholders: communities hosting developments or developers deploying wind power.

As outlined in the introduction, community-based studies generally focus on explaining social responses to WED by examining the way specific factors impact social acceptance at the local scale. These studies have enriched our understanding of WED by

providing explanations for public support or resistance. For example, through these studies, we have come to understand that fairness and effective community engagement in the development process (Gorss, 2007; Lorig, 2007; Zoellner *et al*, 2008) and community ownership and/or economic benefits (Warren & McFadyen, 2010; Musall & Kuik, 2011; Rogers *et al*, 2008; Bidwell, 2013) act as catalyst for social support. On the contrary, perceptions of negative health impacts from WED (Baxter *et al*, 2013; Songsore and Buzzelli, 2014), perceived negative impacts of projects on aesthetics and place attachment (Devine-Wright & Howes, 2010; Devine-Wright, 2009) have been found to trigger resistance to projects. The aforementioned studies reflect a subset of findings which have emerged from research seeking to explain wind energy deployment from the perspective of community responses.

The second major cluster of studies which are relatively newer and growing generally aim to understand wind energy deployment patterns through the examination of roadblocks to deployment from the perspective of developers. Some of these studies have considered the perspective of other stakeholders such as conservation officials and organizations, technical experts and various local authorities within communities hosting or earmarked for projects (e.g., Fischlein *et al*, 2010). The bulk of these studies tend to focus on economic, technical and political factors and their respective implications for the success of developers. These studies have therefore deepened our understanding of WED by unearthing various constraints faced by developers. For example, they have shown that developers are significantly motivated by economic incentives such as FITs and other financial incentives (Friebe *et al*, 2014) and discouraged by unfavorable economic conditions such as the high costs (O'keeffe & Haggett, 2012). Regarding the technical

aspects of WED, grid integration constraints and the intermittent nature of wind power have emerged as stumbling blocks to the success of developers (Richards *et al*, 2012). Finally, good political environments have also been suggested as conduits for developer success (Friebe *et al*, 2014). These aforementioned findings are a subset of insights which have emerged from this cluster of studies.

While the clusters of studies acknowledged in the preceding paragraphs have individually highlighted the role of specific factors in shaping community responses to wind power or determining the success of developers, few studies have demonstrated how a multiplicity of factors impact WED and policy outcomes (e.g., Stephens *et al*, 2009; Wilson & Stephens, 2009; Songsore & Buzzelli, 2014). Additionally, the spatial and temporal scope of most studies are usually limited. Spatially, they tend to focus on individual communities, while temporally, they are usually cross-sectional in design. In view of the nature and structure of the existing literature on WED, this study was driven by the following broad objectives:

1. To provide multiple methodological roadmaps for the utilization of media analysis to better understand wind energy deployment and policy outcomes.
2. To understand the potential impacts of media coverage on public perceptions of and responses to wind energy development in Ontario before and after the implementation of the Green Energy Act.
3. To understand major opportunities and roadblocks faced by wind energy developers in Ontario.

5.2 Summary of Findings

5.2.1 Objectives 1 and 2 (Manuscript 2 and 3 respectively): To provide methodological roadmaps for media content analysis of WED and understand the potential impacts of media coverage on public perceptions of WED in Ontario.

The first goal of the study was to provide methodological guidelines for using media content analysis to understand WED and policy outcomes. As acknowledged in previous sections of the thesis (e.g., Chapters 1 and 2), media analysis has proven to be an effective mechanism for understanding public discourses on WED (Songsore and Buzzelli, 2014; Deignan *et al*, 2013) and, in some cases, variations in deployment outcomes across multiple jurisdictions (Stephens *et al*, 2009). While theories and frameworks such as Luhmann's (1989) ecological communication theory and the SPEED framework (Stephens *et al*, 2008) have been successfully applied in the context of WED, clear methodological protocols for their utilization have not been articulated in the literature. Additionally, other potential applications of these theories remain unexplored.

In the first manuscript of the thesis, I provide methodological guidelines for the utilization of media content analysis in tandem with the SPEED framework and Luhmann's theory to (1) tease out major risks and benefits associated with WED within specific jurisdictional contexts, (2) evaluate multiple stakeholder conflicts around WED and (3) understand risk perception based responses to WED on the community scale. While the first and third applications have already been undertaken by existing studies, the second application is a novel contribution. This application is important because studies on multiple stakeholder conflicts at the interface of WED are rare. Nonetheless, literature strongly suggests that disagreements among multiple wind energy stakeholders

is possibly one of the most significant determinants of successful deployment (Ellis *et al*, 2007; McClymont & O'Hare, 2008).

The second manuscript (Chapter 3) applied the first strand of media content analysis demonstrated in the first manuscript (Chapter 2) to understand key risk and benefit frames associated with WED in Ontario and, consequently, discern public perceptions of the technology. This study examined the evolution of risk and benefit frames relative to Ontario's GEA which spearheaded renewable energy development. With regard to the media analysis conducted in the context of Ontario, findings show that health and economic issues are likely the most salient drivers of social responses to WED. Political, environment and wildlife factors seemed to be of average salience, while aesthetic and technical factors seemed least salient.

Chapter 3 also revealed that media coverage of WED risks were far more prominent than benefits after the GEA was enacted. This trend was evident across all six frames (i.e., health, economic, aesthetic, environment & wildlife, political and technical). Of note is the finding that risk based discourses after the GEA were predominantly driven by the policy itself, suggesting that it triggered negativity around WED. Another striking trend was that discursive strategies of normalization and authorization were more likely to be employed within media coverage of risks in comparison to benefits. Thus, under all six frames, the risk based discourses tended to be more credible and tangible. For example, risk based discourses within the technical frame utilized evidence from research, expert perspectives and technological failures within various jurisdictions to legitimate risks associated with WED. Conversely, the technical benefits of the technology were merely dominated by estimated energy generation from various Ontario-based projects. Similar

trends were evident in the wildlife frame, where risk-based discourses were legitimized via research, expert perspectives and examples of bird and bat kills in various jurisdictions. The framing of wildlife benefits on the other hand did not make an explicit case for the nonexistence of negative impacts. Rather, these benefit discourses tried to minimize negative impact turbines on wildlife.

Based on agenda setting (i.e., the relative prominence of various risk and benefit frames) and the mechanisms of normalization and authorization which dominated risk and benefit based discourses, I found that negative perspectives likely dominate public wind energy discourses in Ontario. The GEA likely resulted in the escalation of these negative discourses by acting as a confounder to pre-existing health, aesthetic, economic, political, technical, environmental and wildlife concerns.

5.2.2 Objective 3 (Manuscript 4): To understand major opportunities and roadblocks faced by wind energy developers in Ontario.

The goal of this manuscript (Chapter 4) was to document and analyse the major challenges and opportunities that confront wind energy developers in Ontario and understand how developers negotiate their relationships with host communities. Through in-depth interviews with developers across Ontario, the study found that the most significant challenges developers deal with pertain to the 'politics' and 'economics' of WED. Regarding the former, developers interviewed were of the view that the lack of community and municipal participation, which resulted from the GEA, created major developer-community disconnects. This disconnect likely explains developers adopting passive approaches in their post-development relations with host communities in the form

of keeping an open door instead of actively approaching communities to inquire about their coexistence with turbines. Developers also felt that the development process in Ontario and its associated policies automatically alienates communities due to complexities. Most Developers who participated in the interviews found some requirements bureaucratic and unnecessary, e.g., a number of developers interviewed felt that funds spent on recording bird and bat deaths could be put towards research aimed at developing practical strategies for mitigating avian mortality around turbines. Rather than objective technical roadblocks, Ontario's political climate (i.e., grid management and administration) were also deemed responsible for grid integration problems.

In terms of economic challenges, the most difficult hurdle developers identified was the provision of benefits to host communities. While they perceived economic benefits as a bridge to social acceptance, they were discouraged from providing these benefits for two major reasons: (1) because they would be perceived as 'greasing of palms' and (2) because it was challenging to define an appropriate spatial scope for the distribution of benefits or the compensation rates to distribute to relevant parties. Nonetheless, it is noteworthy that developers provided economic benefits in response to requests for support by various community organization. They framed these forms of financial benefits as corporate citizenship. The existence of this form of economic benefits challenges exiting literature that tends to frame 'economic benefits' merely as direct payments to communities and individuals living close to turbines. Demands for various benefits by some individuals based on complaints about negative health impacts is likely testament to communities' desire to benefit financially from projects.

In view of these two major roadblocks to developer success, I concluded with suggestions for community-based developments, where individuals will be able to invest diverse amounts into projects. Such a strategy could potentially solve multiple problems by giving communities a sense of attachment to projects as their collective property and create opportunities for communities to reap economic benefits from developments. Additionally, the deep engagement of communities in ownership could create opportunities for community engagement in other controversial decisions such as site planning and turbine distribution. Beyond community engagement, this study also identified the urgent need for detailed tools to guide developers and communities in their engagement with each other.

5.3 Contributions of the study:

5.3.1 Theoretical Contributions

The major goals of this study were to uncover major roadblocks to wind energy deployment both from the perspective of communities who host projects and developers who are responsible for deployment. The study demonstrates the efficacy of Luhmann's (1989) ecological communication theory for understanding WED discourses and roadblocks faced by wind energy developers. Peterson, Peterson & Grant (2004) have noted that the theory provides a useful structure for uncovering major risks and benefits associated with environmental issues. As an extension to Luhmann's theory of ecological communication (which identified law, economy, science, politics, religion, and education as the most crucial channels of communication), Stephens *et al* (2009) developed six discrete frames for capturing risks and benefits pertaining to WED (economic, political, aesthetic, environment & wildlife, health and technical). Theoretically, this study

demonstrates the contextual relevance of these frames for not only capturing and effectively organizing discourses on WED but also revealing mechanisms through which multiple factor interact to determine deployment outcomes and social acceptance. For example, the GEA was found to act as a major confounder to risks under all frames, while health complaints on the community scale were strongly tied to demands for economic benefits, signalling interactions between the health and economic frames. This was especially relevant in the context of this study because of the broad range of discourses that could potentially emerge from the media contents analysed.

Since Luhmann's theory provides a structure for discretely categorizing various risk- and benefit-based discourses pertaining to WED, it is easy to fall in the trap of documenting, analysing and treating various frames as independent. The SPEED framework (Stephens *et al*, 2008) provides much needed theoretical guidance by drawing attention to the integrated workings of multiple factors that impact deployment and decisions around climate change mitigation technologies. Thus, despite adopting the six discrete frames developed by Stephens *et al* (2009) for the study of renewable energy deployment and policy outcomes, the current thesis maintained awareness of how the interplay of multiple frames impact public and developer perspectives and experiences. Important findings from this lens included the fact that anti-GEA discourses acted as confounders to risk-based discourses under all six frames, which was evident in the media discourse. Interviews with developers revealed links between economics and health.

Going forward, the aforementioned theory and framework together reveal the importance of maintaining awareness of other discourses that may emerge within studies on the role of specific factors triggering social responses to WED or impacting the

success of developers. This is particularly important because certain issues which may seem problematic on the surface could likely be driven by more salient underlying factors that could elude researchers. For example, one of these questions that could be asked based on the media analysis of this thesis is whether health concerns are driven by objective concerns about turbine impacts on human health or the desire for economic benefits from developments.

5.3.2 Empirical and Methodological Contributions

This thesis makes valuable methodological contributions by combining two unique qualitative research methodologies, namely, qualitative media content analysis and semistructured interviews. The longitudinal media content analysis of WED in Ontario was used to develop interview questionnaires for use with wind energy developers. Based on the relative novelty of WED in Ontario compared to other jurisdictions, there was no contextual foundation for developing interview questions. However, the media analysis revealed dominant discourses of support and opposition that have been at the core of WED within the province; hence, providing key themes for developing the interview questionnaire instrument. Some of the findings of the media content analysis affirm some already existing research on WED in the context of Ontario. For example, similar to the current study, Baxter *et al* (2013) and Walker *et al* (2014) have found that economic and health concerns are a major determinant of social acceptance in Ontario. Further, the contextual relevance of the media analysis was confirmed by the fact that interview questions resonated with developers who were interviewed. For instance, developers often acknowledged that questions asked were very relevant as follows: “I am sure most developers will tell you that this is a problem we

struggle with…", "That's a great question, it's a great consideration….", "uh-huh…so this is very interesting". Additionally, interview questions often generated long conversations, which often had to be cut short to avoid exceeding interview time limits.

By utilizing an eight-year media content analysis for the first manuscript (Chapter 3), the current study demonstrates the value of longitudinal studies in understanding the context and evolution of WED. The longitudinal analysis was conducted to highlight changes in WED discourses with respect to a major landmark event (i.e., Ontario's Green Energy Act). Indeed the study demonstrates significant shifts in WED discourses after the GEA was implemented. Specifically, negative discourses became more pronounced due to the policy acting as a major confounder to already existing concerns about wind power.

Methodologically, the operationalization of the media analysis and interviews conducted in this thesis adds a broader spatial dimension to existing literature, since most studies tend to be at the community scale. Thus, in comparison to community case studies, relatively few studies have sought to understand WED and policy outcomes on broader spatial scales such as the state level (Stephens *et al*, 2009) or national scale (Liu & Kokko, 2010). The ability of the current study to conduct an analysis on a provincial scale (i.e., within Ontario) is partly facilitated by the application of the media content analysis methodology.

Within the second manuscript of this thesis (Chapter 2), the current thesis makes an original methodological contribution by presenting guidelines for the systematic utilization of media content analysis to understand WED and policy outcomes. As Stephens *et al* (2009) have demonstrated, the utilization of Luhmann's (1989) ecological

communication framework in tandem with the SPEED framework present a strong theoretical foundation for understanding WED through media analysis. This is evident in other studies that have utilized these theoretical perspectives (e.g., Songsore & Buzzelli, 2014). Nonetheless, to date, clear methodological guidelines for utilizing these theories in media content analysis are nonexistent. This thesis therefore addresses this gap and introduces a new potential media analytic approach that could be used to tease out stakeholder conflicts pertaining to WED (see Chapter 2).

5.3.3 Implications for Policy & Practice

A major goal of this thesis was to contribute to existing wind energy policies and the practice of wind energy development in Ontario. Firstly, the media content analysis (Chapter 3) unearthed key factors which are likely key drivers of public support and opposition to wind energy development. Based on the broad breadth and depth of emerging issues, one can easily see the risk of communities being overwhelmed by the technology, especially in a society like Ontario where the development of wind power is relatively novel. This highlights the need for deeper community engagement in the development process - - a process often perceived to be (rather ironically) limited by the GEA. This need for deeper engagement was one of the key recurrent themes during interviews with wind energy developers in Ontario (Chapter 4). Developers identified the lack of engagement as a roadblock to their success. The incorporation of quality public engagement in policies and the practice of WED in Ontario will therefore benefit not just communities, but also other wind energy stakeholders such as developers.

There is substantial evidence within existing literature that points to the fact that community ownership of wind energy projects promotes social acceptance (e.g., Warren

& McFadyen, 2010). Nonetheless, unlike other jurisdiction, opportunities for community engagement in the form of ownership remain limited in Ontario. Tools to empower communities to own projects are also nonexistent. As discussed in the third manuscript of this thesis (Chapter 4), developers expressed confidence that the provision of benefits in the form of payments to communities could promote social acceptance. Nonetheless, various complexities with the provision of benefits similar to findings within existing literature were apparent. For example, developers felt that benefits would be perceived as bribes (see. Aitken, 2010 for similar discussion) or compensation for negative impacts (see Cowell *et al*, 2011 for similar discussion). A possible remedy to this problem seems to be community ownership, not just as a mechanism for fostering acceptance, but also as a means of promoting deeper forms of engagement by host communities. In addition, community ownership could potentially change the way communities perceive wind turbines by encouraging the idea that turbines are communities own property instead of intrusive objects.

A major highlight of this study is the need for policy specificity and simplification to guide both developer and communities, especially regarding their engagement with each other. Through interviews with developers (Chapter 4), it became evident that despite having similar perspectives, developers were conflicted on certain crucial issues. One of these was the spatial definition of community, which tended to raise questions about who should be engaged in the development process and who should be compensated if economic benefits are to be provided. Developers strongly felt that policy and procedural complexities were also responsible for alienating communities from engaging or even holding developers responsible for their actions. These emerging issues

are testament to the need for detailed, specific and simplified policy instruments for WED in Ontario. As a by-product of simplifying policy instruments and the development process, communities could potentially engage better in the development process even in ownership.

While the GEA sought to minimize bureaucracies and delays in the development of wind energy projects, delays remained a long-standing challenge for wind energy developers across Ontario. Developers interviewed in this study indicated that it takes between two and four years to go through all the required processes required to start developing a project. A specific concern was with the fact that errors sometimes result in a full resubmission process, leading to avoidable delays. While this thesis recommends an increase in public participation in the development process, it seems logical to expect that this will result in more delays in the development process as consensus building takes time. Hence, the need to ameliorate some already existing delays to accommodate for complications that could result from public participation in the process and possibly, the ownership of projects.

5.3.4 Study Limitations

Despite making substantial contributions to scholarship on WED and the development of the technology within Ontario, this thesis is not without its limitations. First, the study utilizes media contents to decipher public discourse and perceptions of WED in Ontario. While media discourse has been found to provide insights on public discourses pertaining to WED, media discourses may not always accurately translate into public perceptions, as a host of processes define community perceptions and responses to the technology. These could range from the cultural values of a community to the ways

developers execute their projects within communities, e.g., the third manuscript of this thesis (Chapter 4) shows that developers may not necessarily agree with each other regarding how developments should be undertaken to promote fairness.

This dissertation focuses on a broad spatial scale (i.e., the Province of Ontario). However, it is fair to expect nuanced or significant spatial variations in social responses to WED across multiple municipalities and towns within the province, as values and perspectives are likely to differ spatially. For example, anecdotally, the websites of various resistance groups within Ontario seem to place varying amounts of emphasis on factors triggering resistant attitudes (see. Wind Concerns Ontario, 2015). Nonetheless the current study does not account for these subtle or significant variations. In this regard, future studies could apply the theories and frameworks employed in this study in a comparison of social response across multiple proposed or existing developments.

5.3.5 Directions for future research

This study attempts to provide insights on WED and policy outcomes in Ontario based on public perceptions of the technology and the experiences of wind energy developers within the province. The approaches used in the current dissertation and the study findings provide insights on potential future studies. First, this study demonstrates that there is great value in conducting longitudinal studies on social responses to WED, especially with respect to significant landmark events such as policy changes. While a couple of studies have been conducted to understand the evolution of community attitudes before and after the construction of wind farms (e.g., Krohn & Damborg, 1999; Walker *et al*, 2005), few studies have considered changes in attitudes before and after major landmark events such as policy changes. In such cases, media analysis has been the

dominant approach used (e.g., Songsore and Buzzelli, 2014; Deignan *et al*, 2013). Despite the challenge of recall bias, conducting such longitudinal studies on the ground could provide useful insights on both community and developer experiences and perspectives.

Secondly, while some studies have considered the voices of multiple wind energy stakeholders (e.g., Fischlein *et al*, 2010), I could not find any existing study that singlehandedly sought to understand conflicts between communities, developers and policy makers. Nonetheless literature recognizes conflicting voices as a major determinant of (un)successful WED (e.g., see Ellis *et al*, 2007). Although this study provides a methodological roadmap for filling this gap through media analysis, future studies could also consider studying these stakeholders in person. Such an approach will be similar to the approach provided in this thesis (see. Chapter 2).

As noted earlier, studies that seek to understand how a multiplicity of factors impact social responses to WED are extremely limited. Currently, a combination of Luhmann's theory and the SPEED framework have not been applied in a community context. While this study utilizes the aforementioned theories for media analysis and an interview questionnaire, future studies could consider developing surveys from the media analysis for use with communities hosting projects. This could be specifically useful in jurisdictions where the development of the technology is relatively novel and where there is limited understanding of how and why societies respond to developments in specific ways.

As demonstrated within this study and other existing studies (e.g., Stephens *et al*, 2009), the media play important roles in defining the breadth and depth of wind energy

discourses within various jurisdictions. However, to date, very little is known about the construction of the news specifically from the perspective of journalists and journalistic practices. Future studies on the construction of news around wind energy development could be beneficial to the journalistic community by providing insights on the impacts of coverage and encouraging greater balance on the way the technology is covered.

Finally, while resistance movement emerged as a significant force in impacting the activities of wind energy developers (see Chapter 4) and the general practice of WED, studies have not been conducted to understand the motivations and drivers behind these groups as well as their aims and objectives. This gap presents an opportunity for further work.

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APPENDICES

APPENDIX A: Definition of Frames

Definition of six discrete risk and benefit frames

Frame & Frame Definition	Merits	Demerits
Economic: This frame encompasses issues pertaining to the micro and macro economy. Issues which could emerge within this frame include, but are not limited to taxes, subsidies, jobs, costs, profits, losses, property values, economic benefits and financial compensation.	**Economic benefits of WED:** Job creation, profits, financial benefits (e.g., farmers revenues, household revenues, community revenues), boost to the economy, long term savings, creating fertile grounds for foreign and/ or local investors, cheapness or cost effectiveness of wind power, opening up of manufacturing industry, revive economy, international trade opportunities, community investment opportunities, quick recovery of costs incurred.	**Economic demerits of WED:** Property value declines, waste of tax dollars, too much subsidies needed, temporal jobs, losses to Ontario's economy, expensive technology, tax dollar misuse, power prices will rise, temporal jobs, job losses in traditional energy sector, more important sectors of economy urgently need funds being invested in wind, eventual blow to Ontario's economy, negative effect on other sectors (e.g., fisheries, tourism).
Environment & Wildlife: This frame covers issues pertaining to the physical and natural environments (i.e., flora, fauna and air quality). Specific issue which could emerge under this frame include environmental pollution/cleaning, wildlife (e.g., birds, bats, bees, farm animals and various household pets), plants (e.g., trees, grasses) and farmland, climate change issues.	**Environmental & wildlife benefits of WED:** Environmental friendly technology, no emissions, no pollution, protect wildlife by saving environment, climate change mitigation, physical environment suitable for development(s) due to abundance of wind resources	**Environmental & wildlife risks of WED:** Insignificant GHG emission reduction, not feasible for environmental protection, risk of species extinction, kills birds, bees, bats and other forms of wildlife, destroys plant and animal habitats, destroys ecological sensitive landscape.
Political: The political frame is concerned with issues pertaining to the principles, policies and politics surrounding wind energy development. Specific political issues of interest include bylaws, policies and policy amendments, planning, public engagement, decision making, social movements and their activities and authorities, government authorities in positions of power or opposition, parliamentary debates or discussions.	**Political merits of WED:** Government owes citizens clean energy, wind energy is governments responsibility, important for meeting international GHG emission targets (e.g., Kyoto), Canada trying to be leader in environmental stewardship, government feeling pressured by other jurisdiction engaging in clean energy generation, Ontario aiming to be leading jurisdiction in renewable energy, Green Energy Act (aggressive policy, will speed up developments, etc), community engagement in renewable energy production, government trying to set a good example for other jurisdictions around the world.	**Political demerits of WED:** Unfair development process, lack or public engagement, ignoring public concerns, overriding local level and municipal planning, government not being accountable to public, WED is a mere show-off by government, government engaging in wishful thinking, Green Energy Act or other renewables policies (bad planning, rush by politicians, no straightforward answers to citizens by government, infeasible policy, government not prioritizing the protection of citizens based on policy), deception by government, divisiveness among citizens and communities.
Health: The health frame focuses specifically on the human health implications of WED. Specific health issues include respiratory health and various symptoms (dizziness, headaches, vertigo, sleepless nights, noise emissions, high blood pressure, fainting, swoosh sounds). All health related discourses by (non-)medical experts are also included in this frame.	**Health benefits of WED:** Healthy generation technology which ameliorates need for unhealthy generation sources such as coal, wind energy is totally safe and pollution free, no health effects.	**Health risks of WED:** Several health related symptoms (headache, stress, tinnitus, dizziness, ringing ears, high blood pressure, sleeplessness, etc), health effects of turbines greater than effects of coal, sound cannot be measures, devastation conditions which cannot be explained, turbines make noise (swoosh), shadow flicker problem from turbines, flickering light from turbines causing health problems.

Aesthetic & Cultural: This frame pertains to visual perceptions of wind turbines (i.e., size, shape and color) and landscapes with turbine installations. It also pertains to historical, emotional and cultural attachments to various environments and their respective natural features. Issues under this frame include the beauty of landscapes and the environment, the physical size of wind turbines, cultures and traditions associated with certain environments, emotional attachments to natural features.	**Aesthetic benefits of WED:** Turbines promote tourism, turbines add beauty to landscape (color, shape, size…etc), look of turbines remind people of the importance of sustainability.	**Aesthetic risks of WED:** Negative impact on tourism due to the destruction of landscape aesthetic value, visual pollution, recreational fishing could be destroyed, too may turbines, turbines are ugly, destroys recreational value of landscape, gigantic size, turbines industrial size aesthetically unpleasing.
Technical: The technical frame is concerned with all technological aspects of wind energy development. These include issues such as generation capacity, transmission, maintenance, repairs, efficiency, viability, reliability and other related technical issues associated with the technology.	**Technological benefits:** Technology uses wind which is free and readily available, high output prospects, the technical aspects of wind power are getting better by the day.	**Technological risks:** Wind not reliable, generation capacity sometimes low, unreliability of grid to promote wind, wind power not efficient enough to meet our energy needs, lack of energy transmission facilities, wind not consistent, maintenance of technology a problem, energy produced cannot be stored

APPENDIX B: Research Ethics Approval

Western Research

Research Ethics

Western University Health Science Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Michael Buzzelli
Department & Institution: Social Science\Geography,Western University

NMREB File Number: 105348
Study Title: Wind Energy Development in Ontario: Understanding the Experiences of Development Organizations
Sponsor:

NMREB Initial Approval Date: May 26, 2014
NMREB Expiry Date: December 31, 2016

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Recruitment Items	Recruitment_Email	2014/05/10
Recruitment Items	Telephone_Script	2014/05/10
Instruments	Developer Interview Guide	2014/05/10
Letter of Information & Consent	Letter of information and consent in PDF	2014/05/25
Response to Board Recommendations	Ethics recommendations form.	2014/05/25
Revised Western University Protocol	Amendments to the Western Protocol (application form PDF)-clean copy of the entire revised Western Protocol	2014/05/25

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the HSREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of HSREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Erika Basile	Grace Kelly	Mina Mekhail	Vikki Tran

This is an official document. Please retain the original in your files.

APPENDIX C: Checklist for In-Depth Interviews

Social Responses to Wind Energy Development in Ontario: Developer Interview Guide

Preliminary Questions

- Could you briefly tell me about the vision(s), scope and objectives of your organization in relation to wind energy?
    - How long has your organization been in existence (globally and in Canada)?
    - Why did you choose Ontario?
    - How many projects?
    - How satisfied are you with your progress so far?
- What will you say are the major challenges your institution has faced while developing wind energy in Ontario? How do these compare with your experiences in other jurisdictions if any?

Political:

- What is your general perception of Ontario's Green Energy Act (i.e., merits & demerits)?
    - Which aspects of the policy do you feel need to be amended if any?
    - Do you feel the policy allows for the sufficient and fair engagement of communities in the wind energy development process? Please elaborate.
    - Could anything be done differently to better enhance the deployment of the technology within the province?
- How do you feel about the proposal and approval process for wind energy projects?
    - Do you feel all companies that thunder in applications are given equal opportunities to win contracts?
    - Have you encountered any challenges pertaining to project approvals? Please elaborate.

- Considering the projects you have been involved in, do you think there has been sufficient community engagement in the wind energy development process?
    - How has your company gone about informing local communities about projects?
    - At which stage of the planning/development process have communities generally been involved?
    - On average how many meetings do you hold with communities for each development?

    - How has the attendance and atmosphere (calm confusion…etc) at community meetings been?
    - Which aspects of the planning process did communities contribute to? How were communities encouraged to express their concerns?
    - How were community concerns factored into the development process?
    - With the exception of meetings, what other mediums have you used to access community perspectives?
- Several resistant groups opposed to wind energy development have emerged within the province of Ontario. What is your general perception about the wind energy resistance movement?
    - Have resistant groups had any form of influence on any of your projects? Please provide further insights.

Economic:

- Has your organization been confronted by any major financial and economic roadblocks? Please elaborate.
- One common argument often advanced against wind power is the fact that it is expensive, what is your perspective on that?
    - How important are subsidies for the success of WED?
        - How long do you think it will take the technology to stand on its own feet financially?
- Are you aware of wind turbines affecting property values anywhere or within your host communities? Has your organization been confronted with property value complaints?
- Compared with other jurisdictions, how attractive are the investment opportunities in Ontario? Did that impact your choice of Ontario?
- How important are economic benefits to the social acceptance of WED? Please elaborate.
    - What in your opinion constitutes the fair distribution of economic benefits (i.e., broad community or individuals hosting turbines on their lands)? Why?
    - Is your company compensating host communities financially or providing other forms of incentives in host communities?
        - What are these other incentives if any?
        - On what scale are they being distributed (individual/community)?
        - What is the main purpose for providing these incentives?
    - Are there any cases where you are partnering with community members or local investors within communities? If no, why? If yes, how did that come about?

- Approximately how many local jobs have been provided by your existing projects (per project)? What is the general nature of these jobs (temporal/permanent, technical/common knowledge based….etc.)
- Have lands for your projects been predominantly purchased or leased? Why so?

Aesthetic

- What is your perception about the look of turbines and their aesthetic impacts on host landscapes (i.e., positive or negative)?
  - Do you think community claims about the negative aesthetic impacts of turbines are valid? If yes, how has your organization gone about ensuring that aesthetic concerns are addressed? If no, why?
  - Have you previously considered the aesthetic and cultural values communities attach to landscapes during siting decision? If yes, how have these been factored into the development process? If no, why?
  - Do you think aesthetic concerns are rooted in NIMBY attitudes?

Environment and Wildlife

- What do you deem as the most important environmental benefit of WED? Do you think the technology possesses any environmental risks? Please elaborate.
  - What in your opinion is the contribution of WED to GHG emissions and consequently, climate change?
- I know there has been lots of media coverage on turbines negatively affecting birds, bats and other forms of wildlife. Are you aware of any such negative impacts?
  - Have they occurred on your development sites?
  - If yes, how have you addressed them so far?
  - Did this possibility of negative impacts of turbines on wildlife emerge in the environmental assessment process? How did it influence the orchestration of the development?
  - Do you think environment and health assessments should be the duty of developers or government? Why?
  - What measures have you put in place to ensure that environmental assessments are rigorous?

Technical

- How does wind compare with other renewable energy technologies? Do you think any renewable energy technology possesses greater or similar prospects as wind? Has your organization considered other renewable energy generation technologies? Technically speaking, why wind energy?
- What have been some of the major technical/technological barriers you have faced in the deployment of wind energy? How have these barriers influenced deployment?
- Approximately what percentage of peak generations do turbines on your developed sites produce daily?
    - One of the negative factors often associated with wind energy development is the issue of viability. Does that represent a challenge you are facing? Do fluctuating wind speeds pose a challenge to the developments you have established?
    - Do you think wind power can replace traditional generation methods such as coal and nuclear energy? If yes, how far do you think Ontario is from achieving this goal?
- To what extent do you think wind energy can be an answer to Ontario's present and future energy security needs?

Health

- There have been several complaints about negative health effects of wind turbines. Do you believe that turbines could be causing health problems? Could some of the complaints be legitimate?
    - Have you had any complaints about health problems in any of the sites you have developed? If yes, how have you gone about responding to them?
    - Prior to development(s), how did you carry out health assessments? Do you deem the assessment process rigorous enough to detect possible negative health effects?
    - Who do you think the onus of health assessments should be place on? Why?
- Do you have any post-development strategies in place for monitoring community coexistence with turbines? If yes what are the strategies currently in place? If no, do you deem such strategies as necessary?

Media

- What is your overall sense of media coverage of wind energy development in Ontario and its implications for development organizations?

APPENDIX D: Curriculum Vitae

NAME: EMMANUEL SONGSORE

Education

Doctor of Philosophy, Geography with Environment and Sustainability, University of Western Ontario, London, Ontario 2011-2015

- Thesis title: Wind Energy Development in Ontario: Factors Influencing Deployment and Policy Outcomes

Master of Arts, Geography, University of Western Ontario, London, Ontario 2009-2011

- Thesis title: Community Resistance to Wind Energy Development in Ontario

Bachelor of Arts, Geography Major with Philosophy, University of Ghana, Accra, Ghana 2003-2007

- Undergraduate Dissertation: The Effectiveness and Quality of Basic Education in Legon, Accra.

Awards, Distinctions and Fellowships

- Michael J. Troughton Graduate Student Award, Department of Geography, University of Western Ontario 2014 ($1,500)
- Allen K. Philbrick Scholarship Award, Department of Geography, University of Western Ontario 2013 ($1000)
- Western Graduate Research Scholarship for Doctor of Philosophy in Geography, Western University 2011-2015 ($30,200/year)
- Western Graduate Research Scholarship for Master of Arts, Western University 2009-2011 ($25,200/year)
- Graduate Thesis Research Award, Western University- $750 (2011)
- Western Graduate Teaching Assistant Award Nominee (2009)

Publications

- Songsore, E., & Buzzelli, M. (2014). Wind energy development in Ontario: a process/product paradox. *Local Environment*, (ahead-of-print), 1-24.
- *Municipal incentives for affordable housing in Ontario*, Report prepared for Ontario's Ministry of Municipal Affairs and housing (May, 2013, 20 pages)

Presentations

- Community Responses to Wind Energy Development in Ontario, Association of American Geographers Annual Meeting, New York (February 24, 2012-February 28, 2012)

- Wind Energy Development in Ontario: The Process/ Product Dichotomy, Canadian Association of Geographers Conference, Wilfrid Laurier University & University of Waterloo (May 28, 2012-June 2, 2012)

- Community Resistance to Wind Energy Development in Ontario, Canadian Association of Geographers Conference, University of Calgary (June 1, 2011-June 4, 2011)

Research Experiences

Research Assistant, Western University Department of Statistics and Actuarial Science, Ontario June 2015 to date

- Assessing the quality and effectiveness of students learning of basic statistics
- Analysing qualitative data collected from students in an introductory statistics course

Research Assistant, Western University Teaching Support Center, Ontario July 2015 to date

- Conducting interviews and focus group discussions aimed at evaluating Western Universities Lead TA program

Research Assistant, Canadian Policy Network Housing Internship and Scholar Program, Ontario 2013

- Worked as primary researcher for Ontario's Ministry of Municipal Affairs and Housing.
- Consulted and interviewed planners, housing developers and other housing experts within three municipalities in Ontario
- Computed dollar values of savings which could be made by housing providers via affordable housing incentives available within Ontario using sample housing projects
- Wrote a report entitled "Municipal Incentives for Affordable Housing in Ontario".

Research Assistant, Health Canada Air Pollution Study, University of Western Ontario, summer 2010

- Mounted air pollution monitors within designated geographical locations in the city of London, Ontario
- Ensured that rationale for the study was explained to individuals within neighborhoods where monitors were mounted

Research Assistant, Auran II Health Risk/ Hazard Assessment Research, University of Ghana, December 2008-August 2009

- Handled administrative duties pertaining to project, e.g., letter writing, writing of meeting minutes, organizing multidisciplinary research team for meetings and providing the necessary logistics
- Conducted interviews and focus group discussions with individuals, chiefs and various city health officials
- Worked in the field with a group of researchers

Teaching Experience

Guest Lecturer: Health Geography (Geo 2430), Department of Geography, University of Western Ontario, London, Ontario 2014

- Delivered lecture on Knowledge translation in the context of wind energy development and Health in Ontario

Teaching Assistant: Geography of Health and Health Care, Public Health and Environment, Geography of Hazards, Fundamentals of Geography, Geography of Tourism, Space Exploration

- Teaching assistant for the aforementioned courses from 2009 to date
- Duties have included running tutorial sessions, grading all exams and assignments, holding one-on-one sessions for students who need additional help understanding course material.

Professional Development

Teaching in the Canadian Classroom Seminar, Teaching Support Center, University of Western Ontario, fall 2013

Teaching Mentor Program, Teaching Support Center, University of Western Ontario, January 2014

Teaching Master Class for Graduate Students, Teaching Support Center, University of Western Ontario, March, 2014

Future Professor Workshop Series, Teaching Support Center, University of Western Ontario, July, 2014

Full credit course on The Theory and Practice of University Teaching, Teaching Support Center, University of Western Ontario, January 2015 to April 2015