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# Social responses to wind energy development in Ontario: The influence of health risk perceptions and associated concerns

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## HIGHLIGHTS

- We analyze health risk perception-based responses to wind energy development.
- Health risks concerns are a major driver of public resistance to wind energy.
- Perceptions of injustices strongly fuel resistance to wind energy on health grounds.
- Acceptance of turbines does not imply successful coexistence with turbines.
- Using financial benefits to promote social acceptance could be problematic.

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## ABSTRACT

This study documents and analyzes the role of health risk perceptions and other associated concerns of wind energy development (henceforth WED) in Ontario. Drawing on the risk society framework, we conduct a longitudinal media content analysis to document and analyze perceptions of and responses to WED over a nine year period. Attention is paid to temporal variations in responses relative to Ontario's Green Energy Act (2009) (henceforth GEA); legislation aimed at the rapid expansion of renewable energy. The study reveals that the most radical forms of resistance to WED on health grounds are driven by perceived injustices in the treatment of potential at-risk citizens and citizens with health concerns. The GEA is fuelling these perceptions of injustices in subtle and nuanced ways, particularly by acting as a major confounder to health risk concerns. Contrary to several existing studies, we problematize the use of financial incentives to foster the development of wind energy. We also provide policy recommendations which include the need for increased public engagement in the WED process, the importance of using third party health and environmental assessments to inform developments as well as the need for post-development strategies to address ongoing community concerns.

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## 1. Introduction

Renewable energy development is rapidly gaining attention in several jurisdictions. In 2009, the Province of Ontario passed the Green Energy and Green Economy Act (GEA), a policy driven by several goals including climate change mitigation, energy security and job creation (*A Green Energy Act for Ontario, 2009*). With a generation capacity of approximately 2043 MW (*Canadian Wind Energy Association, 2013*), Ontario is currently at the forefront of WED in Canada. Despite considerably high deployment levels, Ontarians continue to express mixed reactions towards the technology.

Amidst numerous concerns surrounding WED, health has become one of the most contentious policy issues in Canada (*Watson et al., 2012*). Two major publications have fuelled this debate: (1) an expert panel review sponsored by the American and Canadian Wind Energy Associations which suggested that turbines were safe and dismissed the need for further health studies (*Colby et al., 2009*) and (2) a book by a New York based physician (Nina Pierpont) who suggested that wind turbines are a threat to human health (*Pierpont, 2009*). Within the broader scientific community, clear cause-effect relationships have not been established – a standard nevertheless difficult to achieve in epidemiologic studies. Peer reviewed epidemiological evidence to date suggests that people living near turbines may experience annoyance and sleep disturbance (*Pedersen et al., 2007; Pedersen and Waye, 2004, 2007*).

Traditionally, research in the area of health, risk and the media has been interested in understanding how the media influence

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public perceptions of risks (e.g., Harrington et al., 2012; Frewer et al., 2002; Wakefield and Elliott, 2003). Deignan et al. (2013) for instance conducted a study of fright factors within media reports on the health effects of wind turbines in Ontario. The present study augments this body of work by utilizing media contents to document and analyse social responses to WED based on perceived health risks and other associated concerns.

The present study is theoretically rooted in the risk society framework which was developed in parallel by Beck (1992) and Giddens (1990). The theory is premised on the idea that the advent of modern risks resulting from technological advancements has compromised trust in science, policy makers and technology (Beck, 1994, p. 5). Under the risk society framework, four adaptive reactions were developed to conceptualise social responses to perceived risks: (1) *Radical Engagement*, which involves challenging various institutions perceived as responsible for risks; (2) *Sustained Optimism*, which is characterised by maintained trust in science and technology as long term solutions to perceived risks; (3) *Pragmatic Acceptance*, which involves coping with risks and enduring the psychosocial effects thereof (Giddens, 1990) and (4) *Cynical Pessimism*, which involves the use of humour to ward away deep seated risk concerns (Giddens, 1990). More detailed definitions of these reactions are provided in the analytical codebook (see Appendix A). These adaptive reactions have been used in community-based case studies to document diverse responses to risks and hazards (e.g., Wakefield and Elliott, 2003; Luginaah et al., 2002). Similarly, they are used in the present study for a novel documentation and analysis of perceptions of and responses to WED in Ontario.

Most existing studies on social responses to WED have been cross-sectional community case studies (Cowell et al., 2011; Bidwell, 2013; Slattery et al., 2012; Warren and McFadyen, 2010; Hill and Knott, 2010; Rogers et al., 2012). Contrary to such studies, the use of media content in this study is a window on the evolution of social conflicts over time (i.e., nine years) and in a large jurisdiction moving aggressively on WED. The study is driven by two key questions:

- (1) What is the role of health risk perceptions and other associated concerns surrounding WED in shaping community responses the technology in Ontario?
- (2) How have health risk perceptions and other associated concerns surrounding WED evolved over time relative to Ontario's GEA?

This study is a subset of a broader study which revealed that media coverage of the health effects of wind energy skyrocketed in Ontario after the GEA was passed into law (Songsore, 2011); hence, the present aims to understand temporal variations in public attitudes towards WED relative to the policy. We provide policy recommendations which include the need for increased public engagement, the importance of using third party scientific assessments to inform developments as well as the importance of post-development strategies to address ongoing community concerns.

## 2. Methods

Ten newspapers with the highest circulation levels in Ontario were utilised for the analysis. They include the Globe and Mail, Toronto Star, Toronto Sun, National Post, Ottawa Citizen, Hamilton Spectator, London Free Press, Windsor Star, Waterloo Regional Record and Ottawa Sun (Canadian Newspaper Association, 2009). These newspapers were selected because they cover issues of province-wide relevance. Articles were accessed through the academic Factiva and LexisNexis databases. News reports published between January 1, 2002 and the sampling day (September 16, 2010) were used for the study. The year 2002 was chosen as the start date for the sampling because the first commercial wind farm in Ontario was built in that year (Huron Wind, 2010), which coincides with a substantial peak in media coverage of WED (see Fig. 1). Articles were purposefully sampled to ensure they focused on WED and health. Fig. 2 presents a detailed summary of the sampling procedure. A total of 599 articles were analyzed.

Content analysis represents an objective, systematic and replicable research methodology which can be effectively used to study the content of communication (Krippendorff, 2004). Qualitative content analysis was utilised for the analysis, since the aim was to systematically code the latent content of the articles (see Krippendorff, 2004; Weber, 1990). An intercoder reliability test was performed among two coders using a sample of 20 articles. Scott's  $\pi$  test ( $1 \geq \pi \geq 0$ ) results ranged between 0.46 and 0.86 across all four adaptive reactions. Among the responses discussed in more detail below, radical engagement and cynical pessimism recorded the highest and lowest reliability scores respectively. The average intercoder reliability among the four response mechanisms was 0.63. Most discrepancies resulted from misunderstandings of the unit of analysis (e.g., the second coder coded

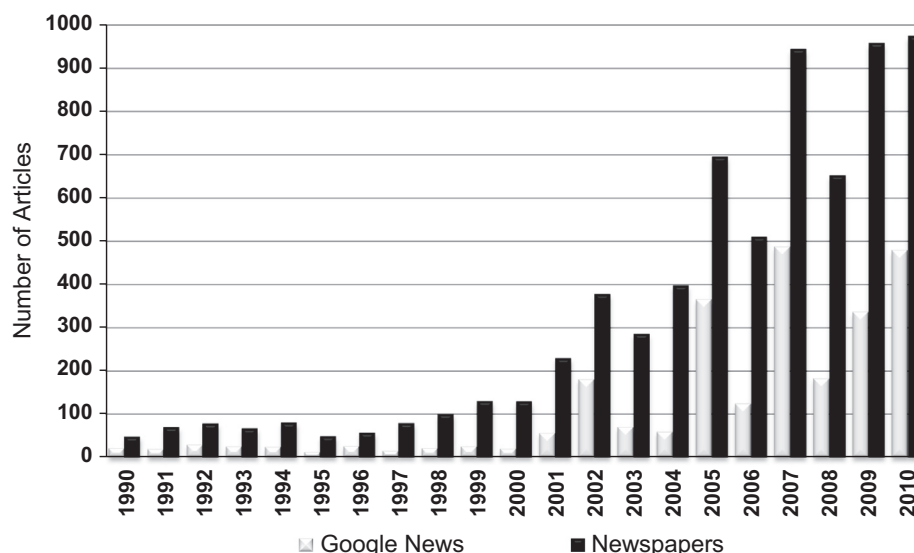


Fig. 1. Temporal trends in media reporting on wind energy development in Ontario.

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