

Winds of Change: A Study of the Acceptability of Renewable Energy in Regional Australia

Professor Lynne Eagle, Dr Breda McCarthy & Professor David Low

Professor of Marketing¹, James Cook University, College of Business, Law and Governance,
Townsville, QLD 4811, Australia, lynne.Eagle@jcu.edu.au, +61 7 478 15717

Senior Lecturer, James Cook University, College of Business, Law and Governance,
Townsville, QLD 4811, Australia, breda.mccarthy@jcu.edu.au

Dean, Dean, James Cook University, College of Business, Law and Governance,
Townsville, QLD 4811, Australia, david.low@jcu.edu.au +61 7 478 14239

Introduction and Background

Electricity is predominantly generated from fossil fuels in Australia (Djerf-Pierre et al., 2015), but concerns about climate change are driving a debate on how to bring about a transition to renewable energy (RE) (Nelson, 2016). Widespread public support is needed when developing large-scale energy infrastructures, such as wind farms (Batel & Devine- Wright, 2015), but the drivers of social acceptance have not received adequate attention (Friedl & Reichl, 2016). Renewable energy has become a top priority for the state government in Queensland (Queensland Government, n.d), but a transition away from coal- fired electricity in Australia has been hampered due to obstacles rooted in politics (Cheung & Davies, 2017; Muenstermann, 2012). High levels of localized resistance – particularly to wind power - are predicted to significantly hamper renewable energy targets set by the Australian federal, state and territory governments (Hall et al., 2015). Community opposition to siting decisions, has been somewhat dismissively classified as NIMBYISM ('Not in My Back Yard'), and the term has been used uncritically in both policy and academic

¹ Professor Lynne Eagle is a Professor in Marketing at James Cook University, Townsville, Australia. She holds a PhD from the University of Auckland in her native New Zealand. Her research interests centre on marketing communication effects and effectiveness, including the impact of persuasive communication on children; the impact of new, emerging and hybrid media forms and preferences for the use of formal and informal communications channels, along with trans-disciplinary approaches to sustained behaviour change in social marketing / health promotion / environmental protection campaigns. She has published in a wide range of academic journals, including the Journal of Advertising and European Journal of Marketing, led the development of both Marketing Communications and Social Marketing texts and contributed several book chapters for other texts as well as writing commissioned expert papers and presenting numerous research papers at international conferences.

material (Beben, 2015; Petrova, 2016). Opposition appears to centre on four factors: dislike of their visual impact (Knopper & Ollson, 2011), turbine noise (Botelho et al., 2015; McCunney et al., 2014), potential dangers to wildlife (Marques et al., 2014) and claimed human health impacts. Government inquiries and reviews have been conducted in several countries, including Australia, and they have concluded that there is no medical evidence of a direct link between turbine operation and human health, although the poor quality of the data has been noted (Chapman, Joshi, & Fry, 2014).

Research Objectives and Methodology

This study aims to evaluate consumers' support for renewable energy sources, including wind farms, and examine priorities placed on factors such as human health and climate change mitigation. A quantitative methodology was chosen and a questionnaire was developed, which is the norm in renewable energy studies (Stoutenborough et al., 2015; Dockerty et al., 2012). Data was collected through field sampling and online distribution. A total of 325 usable responses were obtained. Respondents came from a regional city, Townsville, with an even spread of males and females and a variety of ages and income groups. Questions were informed by the literature (Poortinga et al., 2006; Eagle et al., 2016), noting that the various energy technologies have different environmental, economic and social impacts. 5-point Likert-type scales were used (with 1= strongly disagree and 5 = strongly agree), with one question specifically measuring support for wind energy and a second question providing benchmark data on attitudes. A rank order question was used (1= most important, 6= least important) to examine perceived priorities for generation decisions.

Results/Findings

Table 1 shows that respondents were strongly supportive of renewable energy, with wind and solar receiving the highest mean scores. Battery storage enjoyed strong support, along with hydroelectric and marine power. Nuclear energy was, by far, the least favoured technology. Responses re social, ecological and economic indicators of acceptance are shown in Table 2. Respondents agreed that Queensland's renewable energy sources, such as wind, should be fully exploited and that Queensland was rich in renewable resources. Respondents also agreed with statements such as 'it is our responsibility to develop renewable energy for future generations' and 'high levels of energy use will impact future generations'. The majority of respondents believed in human-induced climate change. Respondents disagree with the statement 'there is no link between electricity used in the home and climate change'. Table 3 indicates that climate change is the most important factor for determining electricity generation policy, followed by cost of electricity and effects on the economy.

Table 1: Support for wind power and other energy technologies (5=strongly agree)

Energy	Mean	SD
Solar	4.70	0.53
Wind	4.62	0.71
Marine Power	4.37	0.87
Hydroelectric Power	4.27	0.76
Battery Storage	4.07	0.89
Biomass	4.01	0.81
Geothermal	3.81	0.99
Fuel Cell Technology	3.61	0.92
Natural Gas	2.98	1.21
Oil	2.72	1.19
Coal	2.63	1.07
Nuclear	2.55	1.32

Table 2: Attitudes towards wind energy, sustainability and climate change (5 = strongly agree)

Attitudinal Item	Mean	SD
Queensland's renewable energy sources (solar, wind) should be fully exploited	4.33	0.95
Queensland is rich in renewable energy sources (e.g. solar, wind)	4.10	0.98
It is our responsibility to develop renewable energy for future generations	4.45	0.74
High levels of energy use will impact future generations' standard of living	4.27	0.85
Human-induced climate change is occurring at some level	4.19	0.85
There is no link between electricity used in the home and climate change	2.43	1.19
Investment in renewable energy is a means of stimulating economic growth	3.95	0.92

Table 3: Electricity generation – priorities for policy makers

Factor – ranked first from a list of six factors:	(%)
Helping to prevent climate change	27.8
Cost of electricity to consumers	17.5
Effects on the economy	15.6
Effects on the natural environment	14.2
Effects on human health & safety	13.2
Level of pollution	12.3

Discussion and conclusion

Contrary to expectations from the academic literature (for example, Marques et al., 2014; McCunney et al., 2014), we find no evidence of NIMBYISM. There is strong support for wind energy, underpinned by a belief in human-induced climate change, awareness of the social impacts of energy use for future generations and ability to exploit natural resources. Given the contradiction between public support and federal / state reluctance to support renewable energy development at the expense of coal generation, Social Marketing would appear to have a potential role to play in strengthening social acceptance and also in countering misinformation from the coal lobby (Muenstermann, 2012), potentially via inoculation strategies such as advocated by Cook et al, 2017 at downstream, midstream and upstream levels of society (Gordon; Luca et al, 2016). The role of social marketing goes beyond individual behaviour change (Saunders et al., 2015) and policy makers can help communities achieve positive social outcomes through information-based or rewards-based interventions (see Šćepanović et al., 2017).

Eagle, L., McCarthy & Low, D., (2018). Winds of Change: A Study of the Acceptability of Renewable Energy in Regional Australia in R. Hay (ed.) Conference Proceedings from the International Social Marketing Conference, 15-17 July 2018, Singapore, pp. 48-53

References

- Batel, S., & Devine-Wright, P. (2015). A critical and empirical analysis of the national-local 'gap' in public responses to large-scale energy infrastructures. *Journal of Environmental Planning and Management*, 58(6), 1076-1095.
- Beben, R. (2015). The Role of Social Marketing in Overcoming the NIMBY Syndrome. *Journal of Positive Management*, 6(1), 3.
- Botelho, A., Arezes, P., Bernardo, C., Dias, H., & Pinto, L. M. C. (2015). *Effects of Turbine Noise from Wind Farms on Local Residents' Decision to Adopt Mitigation Measures*. Paper presented at the Proceedings 8th international conference on environmental and geological science and Engineering (EG'15).

- Chapman, S., Joshi, K., & Fry, L. (2014). Fomenting sickness: placebo priming of residents about expected wind turbine health harms. *Frontiers in public health, 2*, 279.
- Cheung, G., & Davies, P. J. (2017). In the transformation of energy systems: what is holding Australia back? *Energy Policy, 109*, 96-108.
- Cook, J., Lewandowsky, S., & Ecker, U. K. (2017). Neutralizing misinformation through inoculation: Exposing misleading argumentation techniques reduces their influence. *PloS one, 12*(5), e0175799.
- Djerf-Pierre, M., Cokley, J., & Kuchel, L. J. (2015). Framing Renewable Energy: A Comparative Study of Newspapers in Australia and Sweden. *Environmental Communication, 1-22*.
- Dockerty, T., Appleton, K., & Lovett, A. (2012). Public opinion on energy crops in the landscape: considerations for the expansion of renewable energy from biomass. *Journal of Environmental Planning and Management, 55*(9), 1134-1158.
- Eagle, L., Hamann, M., & Low, D. (2016). The role of social marketing, marine turtles and sustainable tourism in reducing plastic pollution. *Marine Pollution Bulletin, 107* (1). 324-332
- Friedl, C., & Reichl, J. (2016). Realizing energy infrastructure projects—A qualitative empirical analysis of local practices to address social acceptance. *Energy Policy, 89*, 184-193.
- Gordon, R. (2013). Unlocking the potential of upstream social marketing. *European Journal of Marketing, 47*(9), 1525-1547.
- Hall, N., Lacey, J., Carr-Cornish, S., & Dowd, A.-M. (2015). Social licence to operate: understanding how a concept has been translated into practice in energy industries. *Journal of Cleaner Production, 86*, 301-310.
- Knopper, L. D., & Ollson, C. A. (2011). Health effects and wind turbines: A review of the literature. *Environmental Health, 10*(1), 1.
- Luca, N. R., Hibbert, S., & McDonald, R. (2016). Midstream value creation in social marketing. *Journal of Marketing Management, 32*(11-12), 1145-1173.
- Marques, A. T., Batalha, H., Rodrigues, S., Costa, H., Pereira, M. J. R., Fonseca, C., Bernardino, J. (2014). Understanding bird collisions at wind farms: an updated review on the causes and possible mitigation strategies. *Biological Conservation, 179*, 40-52.
- McCunney, R. J., Mundt, K. A., Colby, W. D., Dobie, R., Kaliski, K., & Blais, M. (2014). Wind turbines and health: A critical review of the scientific literature. *Journal of Occupational and Environmental Medicine, 56*(11), e108-e130.
- Muenstermann, I. (2012). Australia's climate change, wind farming, coal industry and the 'big carbon plan': Mine coal, sell coal, repeat until rich. *Rural Society, 21* (3) 231- 249.
- Moula, M., Maula, J., Hamdy, M., Fang, T., Jung, N., & Lahdelma, R. (2013). Researching social acceptability of renewable energy technologies in Finland. *International Journal of Sustainable Built Environment, 2*, 89-98.
- Nelson, T. (2016). Redesigning a 20th century regulatory framework to deliver 21st century energy technology. *Journal of Bioeconomics, 1-18*.

- Petrova, M. A. (2016). From NIMBY to acceptance: Toward a novel framework—VESPA— For organizing and interpreting community concerns. *Renewable Energy*, 86, 1280- 1294.
- Pidgeon, N., & Demski, C. C. (2012). From nuclear to renewable: Energy system transformation and public attitudes. *Bulletin of the Atomic Scientists*, 68(4), 41-51.
- Poortinga, W., Pidgeon, N.F., Lorenzoni, I., 2006. Public Perceptions of Nuclear Power, Climate Change and Energy Options in Britain: Summary Findings of a Survey Conducted during October and November 2005. Technical Report (Understanding Risk Working Paper 06-02). Centre for Environmental Risk, Norwich.
- Queensland Government (n.d) *Powering Queensland Plan*. Retrieved from <https://www.dnrme.qld.gov.au/energy/initiatives/powering-queensland>
- Saunders, S. G., Barrington, D. J., & Sridharan, S. (2015). Redefining social marketing: beyond behavioural change. *Journal of Social Marketing*, 5(2), 160-168.
- Šćepanović, S., Warnier, M., & Nurminen, J. K. (2017). The role of context in residential energy interventions: A meta review. *Renewable and Sustainable Energy Reviews*, 77, 1146-1168.
- Stoutenborough, J. W., Shi, L., & Vedlitz, A. (2015). Probing public perceptions on energy: Support for a comparative, deep-probing survey design for complex issue domains. *Energy*, 81, 40