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Social marketing strategies for renewable energy transitions

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ABSTRACT

Transitions to more sustainable energy systems are increasingly required to address the problem of climate change. Different stakeholder groups, however, may not share the same level of acceptability for an increase in renewable energy. This paper examines energy consumers' attitudes towards energy issues, their use of renewable energy in the home and constraints to energy conservation. Respondent-completed questionnaires from 325 people reveal strong support for renewable energy and a belief in human-induced climate change. A multitude of obstacles to energy-efficient practices are revealed by the survey. The paper also explores the role of social marketing in prompting behavioural change and encouraging a transition to renewable energy. Policy makers can utilise these findings to accelerate the transition to renewable energy and build capacity among residents.

1. Introduction

Transitions to renewable energy continue to attract academic attention (see, for example, Araújo, 2014; Markard, Raven & Truffer, 2012). Energy transitions represent a shift in socio-technical systems (Geels, 2004), where this shift unfolds over a long time-span and requires far-reaching changes along different dimensions including technological, organisational, political, economic and socio-cultural (Markard et al., 2012). Although there are many ways to define the concept, an energy transition is defined in the current work as *a long term structural change of energy systems (incorporating generation, distribution and use) from a fossil-fuel-based to a renewable energy-based system*. Furthermore, consistent with government policy in many countries, renewable energy is defined as *energy that is obtained from natural resources, such as solar or wind, that are continually replenished* (Australian Renewable Energy Agency, undated). Internationally, the growth of renewable energy in 2015, at 8.3 per cent, is claimed to be the highest on record, which reflects the significant growth in capacity over the last five years (International Renewable Energy Agency, 2015).

Claims are increasingly being made that nations must transition to more sustainable, renewable energy systems. This is primarily because fossil fuel-based energy generation is deemed to have substantial negative environmental effects such as carbon emissions and associated climate change impacts (Fouquet and Pearson, 2012; Fri and Savitz, 2014; Grubler, 2012; Schultz et al., 2015). Electricity generation in Australia is claimed to account for 38 per cent of greenhouse gas emissions, due primarily to the use of fossil fuels in electricity generation (Byrnes et al., 2013). Data from the Organisation for Economic Cooperation and Development (OECD) show that Australia's per capita emissions rate remains the worst of all 34 OECD countries (Organisation for Economic Cooperation and Development (OECD, 2015). Recent government projections to 2050, however, portray a shift in energy generation in Australia with average annual growth of renewable energy expanding faster (1.5%) than traditional energy sources, such as coal (0.8%), gas (–0.1%) and oil (0.0%) (Syed, 2014). With global demand for electricity predicted to double by 2050 (Dunn et al., 2011), more research is needed to understand how nations can achieve effective energy transitions.

Residential energy conservation is cited as a way to encourage a transition to renewable energy (Abrahamse, Steg, Vlek & Rothengatter, 2005; Frederiks, Stenner & Hobman, 2015; Gray & Bean, 2015; Hards, 2013; Sweeney, Kresling, Webb, Soutar & Mazzarol, 2013; van Doren, Giezen, Driessen & Runhaar, 2016; Vine, Buys & Morris, 2013). Consumer-oriented studies of energy conservation are sparse, particularly in Australia (see Moloney et al., 2010; Mullaly, 1998) The literature on energy conservation is linked with a long-established body of work on the determinants of pro-environmental behaviour (Faiers, Cook & Neame, 2007; Jackson, 2005; Steg & Vlek, 2009; Wilson & Dowlatabadi, 2007). This has seen a wide range of theories applied to pro-environmental behaviour; however, there is no agreement on the most effective change strategies nor the

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fundamental principles on which strategies can be built (Moloney et al., 2010). The complex interaction of factors influencing decisions to move towards renewable energy are not well understood and it is acknowledged that "more insight is needed into factors influencing consumers' acceptance of future energy systems" (Leijten et al., 2014, p. 973). For instance, a study by Bird et al. (2014) found that Australians' support for nuclear power reduced post the Fukushima Daiichi nuclear plant disaster in 2011 (i.e., an event can serve as a catalyst for forming or changing an opinion). Leijten et al. (2014) state "it is therefore essential to better understand how to promote the transition towards a sustainable energy system at the macro and meso (e.g., political, technological, institutional) levels and at the micro (e.g., individual, household) level" (p.973). This paper considers the micro level through the perspective of residents' attitudes towards, and acceptance of, renewable energy.

While it has been noted that transitions towards renewable energy are necessary, acceptance of this among different stakeholders cannot be taken for granted. Public opinion is important for complex issues such as climate change (Pietsch and McAllister, 2010). Widespread support has become reified as a starting point for research on public responses to large-scale energy infrastructures (Batel & Devine-Wright, 2015). Social acceptance is a concept that significantly shapes the implementation of renewable energy technologies and achievement of targets (Moula et al, 2013). The focus of this paper is not on technology development per se, but rather the need to build social acceptance and increase uptake of renewable technologies, as these aspects are noted as having been neglected (Devine-Wright, 2007; Huijts et al., 2012; Wüstenhagen et al., 2007). Despite increased academic attention, no clear definition of social acceptance of renewable energy technologies exist; instead, it may be a concept of multiple dimensions (see Wüstenhagen et al., 2007 for a discussion).

Previous energy-related studies are limited in that there is a tendency to focus on a single energy technology and a failure to assess public attitudes within context (Stoutenborough et al., 2015). This paper attempts to address these challenges through a social sciences perspective. Social sciences are ideally situated to address human decisions – especially in relation to choice decisions for energy sources and consumption levels – and for the identification of barriers to sustained behaviour change (Sovacool, 2014). Accordingly, the objective of this study is to evaluate consumers' behaviour in relation to energy conservation and to examine the perceptions and attitudes of consumers regarding renewable energy, in an attempt to understand the degree of social acceptance among Queensland residents. Further examination of these findings will then be through the application of social marketing theory i.e.: "social marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good"[1]. Policy makers have recommended a wider application of social marketing to address environmental problems (Dahl, 2010; Menegaki, 2012). It is apparent, however, that authors in the energy sector confuse social advertising with social marketing, advocating mass media activity only or failing to move beyond vague descriptions of its potential (Chen et al., 2015; Frame and Newton, 2007). Nevertheless, the importance of this tool is evident in that "governments have to convince citizens that the problem [climate change] is so serious that they must change long-established patterns of behaviour" (Pietsch and McAllister, 2010, p. 218). Furthermore, Bird et al. (2014) found that "people will not voluntarily accept a reduction in living standards to reduce future [global] warming" (p. 652).

This research contributes to the literature in three ways. Firstly, it provides a contextualised account of energy practices by Australian consumers. Australia has a high reliance on fossil fuel-generated electricity and is recognised as one of the most carbon-intensive countries in the world (Clean Energy Council, 2015), albeit having considerable natural advantages in renewable energy. The first research question focusses on understanding Australian consumers' energy consumption behaviour. Secondly, the paper provides a focus on social acceptance of renewable energy technology options. Social acceptance has been an aspect of behaviour which is noted as largely ignored to date (Batel et al., 2013). The second research question explores consumers' attitudes and preferences towards renewable energy development. Thirdly, the research combines the concept of social acceptance with energy conservation behaviour in the home – an approach which is also rare in the literature. By delving into both social acceptance and energy conservation practices, a deeper understanding of what consumers think about energy issues can be harnessed. The third research question focusses on identifying residents' preferences for investment into renewable energy.

2. Methods

2.1. Research instrument and variable selection

A questionnaire was developed as part of a larger project on transitioning to renewable energy. Questionnaires have become a well-established and valid research instrument in the energy conservation literature (see Thøgersen and Grønhøj, 2010). Furthermore, Australian consumers are well acquainted with this approach since information about their domestic household is required by the government (e.g. the Census). Questions were based on key themes in the literature and included questions drawn from previously validated instruments. Respondents were asked about electricity usage and attitudes towards renewable energy in a variety of forms including dichotomous scales (i.e., yes or no), five-point Likert scales (e.g. 1 = not at all important to 5 = very important), ranking scale (e.g. 1 = most important to 6 = least important), and tick-the-box options (for demographic data only). The literature (e.g., Attari, DeKay, Davidson & De Bruin, 2010; New Environmental Paradigm scale by Dunlap and Van Liere, 1978) informed some questionnaire items while the authors constructed others. For this study in particular, variables relating to acceptance, consumers' energy consumption behaviour, attitudes towards climate change and government preferences were of importance and are further explained below.

2.1.1. Acceptance of renewable energy and energy consumption behaviour measures

Acceptance of renewable energy and alternative energy sources was captured in a 12 item scale, using a five-point Likert scale (e.g. 1 = strongly oppose and 5 = strongly support). We regarded acceptance of renewable energy as an attitude towards renewable energy, with some degree of support, or lack of support, for an increase in its supply and use. The structure of the question allowed for comparison across the different types of energy sources, including fossil fuels. The question also assessed support for technologies used to store electricity. Brief explanations of the technologies were given since the research dealt with complex issues and we wished to avoid posing questions that would confuse or frustrate respondents. Previous studies on public attitudes towards energy (Stoutenborough et al., 2015) informed this question, along with industry and government reports.

There are many ways to save electricity in the home and they differ in terms of impact and demand on individual resources (Thøgersen and Grønhøj, 2010). Adoption of renewable energy technologies by a large consumer base can significantly reduce societies' dependence on fossil fuels and greenhouse gas emissions (Claudy

[1] Definition of social marketing endorsed by the Boards of International Social Marketing Association based in the United States of America, the European Social Marketing Association, and the Australian Association of Social Marketing in 2013.

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