



How do tourism firms innovate for sustainable energy consumption? A capabilities perspective on the adoption of energy efficiency in tourism accommodation establishments



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ABSTRACT

Previous studies demonstrate the role of firm capabilities in the adoption of environmental innovations and sustainability measures. However there remains a gap in understanding how particular combinations of capabilities may give rise to different patterns of innovation adoption across firms in the tourism industry. The study addresses this gap by advancing insights on the capabilities of tourism accommodation establishments to adopt environmental technologies and measures in their maintenance and operational activities; and the extent to which tourism firms exploit their relation with a type of business partner (engineering consulting firms in this study) to appropriate knowledge about environmental innovations and build absorptive capacity. For this purpose, the research builds a qualitative study on the adoption of energy efficiency measures in hotels in Malta, a Mediterranean tourism destination. The findings demonstrate different patterns of innovation adoption amongst the firms in terms of the range of energy technologies and measures adopted that are contingent on the firms' particular combination of capabilities to solve problems around energy efficiency; and to accumulate knowledge about energy solutions through creating spaces for innovation adoption. Tourism firms that build internal capabilities for adoption of energy efficient measures and technologies are more likely to mobilize their relation with engineering firms in order to co-produce innovative energy efficient solutions. The policy implication is that policy measures should increasingly promote the development of capabilities for energy management alongside programmes that are focussed on the diffusion of environmental technologies.

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1. Introduction

Environmental action in tourism has gathered considerable attention in the literature. One reason for this is the increasing pressure for tourism to reduce its contribution of carbon dioxide emissions and transition towards a greener industry (Blanke and Chiesa, 2011). Despite the general perception that services have a lighter environmental impact compared to manufacturing, they have been shown to contribute a significant share of carbon dioxide emissions from indirect activities (Cainelli and Mazzanti, 2013; Desmarchelier et al., 2013). Another reason is economic: the tourism industry is susceptible to changes in oil prices that have a ripple effect on productivity and growth (Day and Cai,

2012). Thus tourism firms need to take steps to reduce the impact of their activities on the environment and adopt environmental innovations.

Whether developed internally, or adopted from the outside, environmental innovations require firms to develop the necessary learning and acquire relevant external knowledge for innovation adoption (De Marchi and Grandinetti, 2013; Gebauer et al., 2012). Previous studies link the degree of environmental performance of firms with the presence of dynamic capabilities (Florida et al., 2001; Hofmann et al., 2012; Sharma and Vredenburg, 1998). Nonetheless, the question of how these capabilities develop has often been overlooked (del Río et al., 2011; Sarpin and Yang, 2011; van Kleef and Roome, 2007). Specifically, one aspect that requires further investigation and that this study intends to address is how particular combinations of capabilities may give rise to different patterns of innovation adoption (den Hertog et al., 2010; Hofmann et al., 2012; Kindström et al., 2013).

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Innovation does not depend solely on a firm's internal capabilities and is contingent on the ability to appropriate knowledge about environmental technologies from external sources; this is the firm's absorptive capacity (Cohen and Levinthal, 1990). The role of absorptive capacity in innovation has been widely acknowledged; however the question of how a firm leverages its capabilities to build absorptive capacity for environmental innovation adoption has received less attention in the literature (Gebauer et al., 2012; Hervas-Oliver et al., 2011; Weigelt and Sarkar, 2012). There is evidence to suggest that a firm's internal knowledge base and competences moderate access to external knowledge sources, with some indication that firms with higher absorptive capacity have access to a larger variety of external knowledge sources and are better equipped to assimilate this (De Marchi and Grandinetti, 2013; Hansen et al., 2002; Hervas-Oliver et al., 2011; Horbach, 2008; Weigelt and Sarkar, 2012). This leaves scope to further investigate how a firm exploits its internal capabilities and learning to build absorptive capacity.

The sub-set of environmental innovations that is considered in this study is innovative energy technologies and measures adopted by tourism firms and specifically hotels. The rationale for taking this focus stems from the fact that energy consumption makes up the largest proportion of hotel running costs after staff costs and is thus an issue of principal concern (Leonardo Energy, 2008). Empirical studies have estimated that energy management practices can bring a considerable saving, of between 10 and 15% to the total energy that hotels consume, depending on the age and size of the hotel, as well as the type of equipment installed and the maintenance and operating procedures in use (CHOSE, 2001; HES, 2011).

Energy efficiency is improved by using a smaller amount of energy to achieve the same output (Rademaekers et al., 2014). Many of these energy innovations are integrated in the maintenance and operations of hotels (Sarpin and Yang, 2011). The tasks associated with operations management include overseeing the plant rooms and machinery such as the heating, ventilation and air-conditioning systems (HVAC) and controlling the costs of heating, lighting and power through periodic inspection of the hotel facilities across the various departments (front-office, housekeeping, catering etc. – Ismail, 2001). Thus maintenance activities provide a relevant focus where to investigate the adoption of energy efficient technologies and measures.

This study intends making two contributions. First, by exploring how tourism firms combine their capabilities and learning in order to adopt energy efficient innovations, it identifies different innovation adoption patterns. Second, it intends filling a gap in understanding how the firms leverage capabilities to build absorptive capacity for energy efficiency innovation.

The structure of the paper is as follows. The next section reviews the literature on the adoption of environmental innovations, bringing out its specific characteristics and discussing the capabilities for environmental innovation. The methodology describes the qualitative approach used to explore energy efficiency in accommodation establishments in Malta. Then the findings identify a spectrum of innovation activity amongst the firms investigated that arises through the presence of particular combinations of capabilities for innovation adoption; the implications for absorptive capacity are also discussed. Finally, some implications for managers and for policy-makers are provided in the conclusion.

2. Theoretical underpinnings

The adoption of environmental technologies and measures in tourism firms has been shown to improve firm performance (Álvarez-Gil et al., 2001; Orfila-Sintes and Mattsson, 2009). The

literature has evidenced a link between the implementation of environmental management practices and increased production efficiency in accommodation establishments that could also represent a source of differentiation enabling firms to derive a competitive advantage (Orfila-Sintes and Mattsson, 2009). There is scope to explore how capabilities influence the firm's propensity to take decisions about which environmental innovations to adopt and how to implement these (del Río, 2013; Hofmann et al., 2012; van Kleef and Roome, 2007).

2.1. Characteristics of environmental innovations

Environmental or eco-innovations have been defined very broadly to include novel technologies as well as process innovations where new or modified elements are introduced in the firm's production or service operations that make these more resource efficient (Damanpour, 1991; del Río, 2013; Kemp, 2010; Nijkamp et al., 1999). In addition, there are organisational innovations that refer to the introduction of new management techniques and working concepts and practices (Rubalcaba et al., 2010). An eco-innovation is not necessarily new to the market; rather it can be new to the company developing or adopting it (Kemp, 2009). Based on this understanding, an eco-innovation encompasses both the creation of product innovations, for example by manufacturers, and the implementation or adoption of products, technologies, services and practices by firms (Arundel and Kemp, 2009).

A distinguishing feature of an eco-innovation is its reduced environmental impact, whether this stems from a purely environmental motivation or otherwise (Carrillo-Hermosilla et al., 2010; Könnölä et al., 2008; Nijkamp et al., 1999). For example, energy efficiency innovations are principally driven by cost reduction and improvements in operational performance whilst the environmental benefit of reduced energy consumption is a secondary motive (del Río, 2013; Nijkamp et al., 1999).

The extent or degree of change brought about by eco-innovations can be expressed in terms of incremental and radical processes. Tourism firms have been shown to adopt both radical innovations such as the first-time adoption of environmental measures and technologies that require the firm to appropriate new knowledge; as well as making incremental competence-enhancing modifications that optimize existing processes such as environmental quality management systems (Carrillo-Hermosilla et al., 2010; Martinez-Ros and Orfila-Sintes, 2009).

2.2. Dynamic capabilities for environmental innovation adoption

Empirical studies show there is a link between dynamic capabilities and the propensity of a firm to take environmental action, distinguishing between proactive firms and reactive firms that are unable to leverage similar capabilities (Hofmann et al., 2012; Sharma and Vredenburg, 1998). When considering that the innovation adoption process occurs through a number of different stages (Bessant and Rush, 1995; Damanpour, 1991; Rogers, 2003), firms are required to deploy a portfolio of capabilities. In the initiation stage of adoption, firms need to define the problem and gather information and knowledge to eventually make a decision about adopting an innovation; this could entail capabilities to recognize the requirements for a technology and explore technological options (Bessant and Rush, 1995). Then there are those activities in the implementation stage that facilitate putting an innovation into use and continuing to use it once the innovation has been implemented (Damanpour, 1991; Rogers, 2003). According to Bessant and Rush (1995), implementation requires capabilities to select the most appropriate technology

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