

## **CLIMATE CHANGE AND SUSTAINABLE TOURISM: CARBON MITIGATION BY ENVIRONMENTALLY CERTIFIED TOURISM ENTERPRISES**

HEATHER ZEPPEL AND NARELLE BEAUMONT

Australian Centre for Sustainable Business and Development,  
University of Southern Queensland, Springfield, Australia

---

Tourism is susceptible to the impacts of climate change on destinations and businesses, but also contributes to the causes of climate change via greenhouse gas emissions from travel. This article reports on carbon mitigation actions by environmentally certified tourism enterprises in Queensland, Australia. The survey results profile attitudes to climate change, emissions auditing, carbon mitigation actions, and motives for emissions reduction. The study revealed that most operators believed climate change was an important issue for tourism and had implemented a range of carbon mitigation actions in energy, water, and waste reduction. The most popular actions were energy efficiency and reducing energy use, while less popular measures were adopting renewable energy and carbon offsetting. Tourism operators preferred lower cost actions that were easy to implement and would provide cost savings. The key motives for tourism operators implementing these carbon actions related to ecological responsibility and business competitiveness via cost savings and differentiating their business as “climate friendly.” These motivations align with general business principles driving the implementation of socially and environmentally responsible practices by companies. The findings suggest that environmentally certified tourism enterprises now consider emissions reduction measures to be an integral part of sustainable tourism development.

Key words: Climate change; Carbon mitigation; Environmental certification; Ecoefficiency actions; Sustainable tourism

---

### Introduction

The tourism industry is susceptible to the physical and socioeconomic impacts of climate change on destinations and businesses. Tourism also generates greenhouse gas (GHG) emissions from transport and

travel-related activities that contribute to climate change. In response, government departments and tourism agencies have supported carbon mitigation strategies based on ecoefficiency actions to reduce GHG emissions and operational costs for the travel

industry, along with adaptation strategies to manage the biophysical impacts of climate change on destinations (Becken & Hay, 2007, 2012; Gössling, 2011; Hall & Higham, 2005; Schott, 2010; Scott, Hall, & Gössling, 2012; Sustainable Tourism Cooperative Research Centre [STCRC], 2009; Zeppel, 2012a, 2012b). However, tourism operators have been reluctant to allocate expenditure on implementing adaptation strategies in the face of uncertainty and skepticism surrounding climate change issues (Turton et al., 2010). In contrast, a growing number of tourism operators are reducing their GHG emissions by adopting a range of carbon mitigation measures as both a cost saving and sustainability strategy (e.g., Vernon, Essex, Pinder, & Curry, 2003; Zeppel, 2012a). According to Becken and Hay (2007), there are four mitigation strategies whereby the tourism industry can reduce GHG emissions, namely: reduce energy use, improve energy efficiency, increase the use of renewable energy, and sequester or store carbon through sinks (i.e., offsetting). The key mitigation strategies adopted by most tourism businesses are reducing energy use and improving energy efficiency, along with water conservation and waste recycling measures (Becken, 2012; Carmody & Zeppel, 2009; Coles & Zschiegner, 2011; Vernon et al., 2003; Zeppel, 2012a). An additional mitigation strategy is to modify or influence tourists' travel behavior with regard to frequency, distance, type of travel, or mode of transport (Gössling, Scott, Hall, Ceron, & Dubois, 2012; Hall, 2011; Scott et al., 2012). The focus of this article, however, is on carbon mitigation strategies implemented by environmentally certified tourism enterprises in Queensland, Australia. In this article, "Mitigation of climate change involves taking actions to reduce greenhouse gas emissions and to enhance carbon sinks" (STCRC, 2009, p. 5).

Several reports from global tourism organizations synthesize knowledge and strategies about the climate change issue (World Tourism Organization [WTO] & United Nations Environment Programme [UNEP], 2008) and outline goals for the tourism industry to reduce its carbon emissions (World Travel and Tourism Council [WTTC], 2009). These reports highlight the impacts of climate change on tourism destinations worldwide, potential implications for tourist demand, the tourism industry's contribution to global carbon emissions, and adaptation and mitigation policies and measures that

could be adopted (WTO & UNEP, 2008). A report on *Climate Change and Tourism Policy in OECD Countries* (Organisation for Economic Co-operation and Development [OECD] & UNEP, 2011) states that the tourism industry and national governments need to do more to reduce carbon emissions from travel. It found only one third of OECD countries have identified policy options to reduce tourism emissions. The WTTC has outlined goals for the global tourism industry to reduce carbon emissions by 25% of its 2005 levels by 2020 and by 50% by 2035 (WTTC, 2009). However, as noted by Scott (2011), these are "aspirational" targets that, without specific plans for achieving them, may be interpreted largely as rhetoric.

In Australia, the national government responded to this issue by establishing a National Tourism and Climate Change Taskforce, producing a national action plan for tourism and climate change, a climate change guide for tourism operators supplemented by industry workshops, and a tourism strategy that included climate change issues (Department of Resources, Energy and Tourism [DRET], 2008, 2009, 2011). National, state, and territory government tourism agencies in Australia have also responded by providing information on climate change and carbon mitigation for tourism operators, with Tourism Queensland being one of the more proactive agencies (Zeppel & Beaumont, 2012b). Industry organizations have produced reports on climate change and tourism and provided assistance for their members on carbon mitigation strategies (Queensland Tourism Industry Council [QTIC], 2008; Tourism and Transport Forum [TTF], 2008, 2011).

Research has found that the traveling public is aware of the issue of climate change but does not necessarily link it to tourism or their travel behavior (Becken, 2004, 2007; Cohen & Higham, 2011; Eijgelaar, Thaper, & Peeters, 2010; Gössling & Schumacher, 2010; Higham & Cohen, 2011; McKercher, Prideaux, Cheung, & Law, 2010; Tiller & Schott, 2013). Recent studies of tourism operators suggest that, while some do not perceive a connection between their operations and climate change (Byrnes & Warnken, 2006; Hall, 2006; Su, Hall, & Ozanne, 2013), others are becoming aware of the link and the need for action on emissions reduction (Gössling & Schumacher, 2010; Zeppel, 2012a). However, of the few studies undertaken to date,

some have found low uptake of carbon mitigation actions (e.g., Becken, 2012; Curtis, 2002; Dalton, Lockington, & Baldock, 2007; Su et al., 2013) while others have found relatively high levels of ecoefficiency actions adopted by tourism enterprises (e.g., Coles & Zschiegner, 2011; Vernon et al., 2003; Zeppel, 2012a).

This article presents the results of a survey of environmentally certified Queensland tourism enterprises across a number of industry sectors (i.e., accommodation, tour operators, attractions, and convention centers). The aims of the survey were to identify the attitudes of the tourism enterprises to climate change and reducing their carbon emissions; to profile the carbon mitigation actions that the tourism enterprises have implemented; and to analyze the motivations of the tourism enterprises for implementing these actions.

The article first reviews the literature surrounding climate change and tourism at both a global and Australian level, including government and industry responses. It then reviews academic literature and research in relation to attitudes towards climate change and tourism among the traveling public and tourism operators, carbon mitigation actions that have been implemented by both cross-sector and tourism businesses, and motivations for implementing such actions. The methodology adopted in the survey of tourism enterprises is then outlined, followed by detailed results, and a discussion of the findings in terms of the motivation of tourism operators for implementing ecoefficiency actions. This article compares the motivations for carbon mitigation measures by environmentally certified tourism enterprises with the more general business motivations and drivers for adopting corporate social and environmental responsibility practices (Bansal & Roth, 2000).

## Literature Review

### *Climate Change and Tourism*

It has been widely documented that tourism is susceptible to the adverse effects of climate change on destinations and businesses (e.g., Becken & Hay, 2007; Hall & Higham, 2005; Scott & Becken, 2010; Turton et al., 2010; WTO & UNEP, 2008). Tourism is highly dependent on the natural environment and

can therefore be affected by climate change due to impacts on water levels and quality, snow and reef conditions, and wildlife and biodiversity, as well as increased climate risks from higher temperatures, infectious diseases, wildfires, and extreme weather events (WTO & UNEP, 2008). In Australia, research has focused on developing adaptation strategies for key tourism destinations (STCRC, 2009; Turton, Hadwen, & Wilson, 2009; Turton et al., 2010; Ruhanen & Shakeela, 2013), while Jopp, DeLacy, and Mair (2010) developed a framework for regional destination adaptation to climate change.

Tourism is also a major contributor to the causes of climate change via GHG emissions from transport and travel activities (Becken & Hay, 2007; Gössling, 2011; Scott et al., 2012). Although not as high as “heavy industry” (Dalton et al., 2007, p. 568), tourism’s overall contribution to greenhouse gas emissions has been estimated at between 5.2% and 12.5% of the global total (Scott, Peeters, & Gössling, 2010). Travel and transport represents the highest percentage of tourism’s carbon emissions at 75%, but accommodation contributes 21% with activities contributing a further 4% (WTO & UNEP, 2008). In Australia, research has estimated that tourism’s GHG emissions range from 3.9% to 5.3% of total industry emissions (Dwyer, Forsyth, Spurr, & Hoque, 2010). According to Becken and Hay (2007), it is necessary to adopt a policy framework for tourism that addresses both the impacts of climate change on tourism via adaptation strategies and the contribution to climate change by tourism via mitigation strategies. Mitigation strategies are designed to reduce GHG emissions or enhance carbon sinks, thus “reducing the *extent* of global warming” (STCRC, 2009, p. 5). As this article is concerned with carbon mitigation practices by tourism enterprises, the focus will be on ecoefficiency actions in energy, water, and waste that reduce carbon emissions and operating costs.

### *Climate Change and Australian Tourism*

In Australia, the national government responded to the issue of climate change impacts on tourism in a number of ways. In 2007, it established a National Tourism and Climate Change Taskforce. A subsequent national action plan for tourism and

climate change focused on a tourism industry prepared for future constraints on carbon emissions (DRET, 2008). The *Climate change guide: Mitigation and adaptation measures for Australian tourism operators* provided a rationale for implementing mitigation measures, as well as examples of specific emissions reduction practices that could be initiated by tourism operators (DRET, 2009). This guide was supplemented by a series of industry workshops conducted throughout Australia in 2009. The 2011–2012 priorities for the *National long-term tourism strategy* also focused on building industry resilience to the economic impacts of climate change while increasing small business adoption of climate change mitigation initiatives (DRET, 2011). The *National Greenhouse and Energy Reporting Act 2007* and *Clean Energy Act 2011* also require large tourism enterprises such as airlines (e.g., Qantas, Jetstar, Virgin Australia), and other transport providers, to report their emissions over an annual threshold of 25,000tCO<sub>2</sub>-e. From July 1, 2012, liable entities such as airlines must also pay a carbon tax of AUD\$23tCO<sub>2</sub>-e, while all tourism enterprises face higher charges for energy, water, products, and materials (Dwyer, Forsyth, Spurr, & Hoque, 2013).

The National Tourism and Climate Change Taskforce recommended that tourism agencies develop emissions management tools and provide advice about carbon offsets for operators. A recent review of nine Australian national, state, and territory tourism agencies found that they were all promoting carbon reduction initiatives and carbon offsetting for tourism operators, with some more proactive than others (Zeppel & Beaumont, 2012b). For example, Tourism Queensland, as one of the more proactive agencies, had developed a range of tools and programs to support operators in reducing their carbon emissions and costs. These resources included fact sheets on climate change and carbon offsetting; website resources on sustainability and climate change; a toolkit for coastal tourism operators to assess and address climate risks; and programs in which tourism operators adopted sustainability initiatives to improve their environmental performance and emissions reductions (e.g., Sustainable Regions, Low Carbon Diet, EcoBiz, and ClimateSmart business clusters) (Zeppel & Beaumont, 2012a, c).

Industry organizations have also addressed the issue of climate change through a number of reports and articles. A state-based organization, the Queensland Tourism Industry Council (QTIC), produced a report for its members explaining the issue of climate change and its implications for tourism businesses and outlining strategies for managing risk and reducing GHG emissions (QTIC, 2008). On an Australia-wide basis, the Tourism and Transport Forum (TTF) produced a position article that specifically focused on the aviation, transport, and tourism sectors' contribution to GHG emissions, the implications of inaction, and examples of industry action to address the risks of climate change (TTF, 2008). A more recent report highlighted the economic impact of the carbon tax of \$23tCO<sub>2</sub> (effective from July 1, 2012) on the Australian tourism industry, particularly domestic aviation and tourist accommodation, and the need to reduce emissions to protect natural assets and improve long-term competitiveness (TTF, 2011).

#### *Awareness of and Attitudes Towards Climate Change and Tourism*

Although climate change is receiving widespread scientific attention and media publicity, there is still a degree of uncertainty and skepticism surrounding climate change issues. As noted by Turton et al. (2010), this is one of the barriers inhibiting the adoption of adaptation strategies by tourism operators. A number of studies have specifically examined this issue from the perspective of the tourist or the tourism operator. McKercher et al.'s (2010) study of Hong Kong residents found that the majority considered climate change to be a serious issue but these concerns did not influence travel behavior or consumer demand for ecofriendly practices at tourism destinations. Gössling and Schumacher (2010) found that more than 90% of tourists surveyed in the Seychelles agreed that "the world's climate is changing" (p. 386), but only two thirds believed that aviation contributed to the problem. Similarly, almost all Antarctic cruise passengers surveyed by Eijgelaar et al. (2010) were aware of climate change, but only one fifth believed their travel had a large impact on the problem. Becken's (2007) research involving five focus groups at a New Zealand youth hostel revealed that participants

regarded climate change to be a major global problem, but had low awareness of the impacts caused by air travel and were unwilling to reduce their level of travel. Interviews with 15 Norwegian travelers also revealed a high level of concern about climate change, though none were prepared to forego long-haul air travel as a result (Higham & Cohen, 2011). Cohen and Higham's (2011) interviews with 15 UK consumers found a range of attitudes, including some who were unaware of the impact of air travel on climate change, several who were aware but unwilling to change their travel behavior, and others who were aware and starting to travel with a "carbon conscience" (p. 331). Becken's (2004) research found that just over a half of tourists thought global climate change was an issue for tourism, while a recent study of New Zealand residents found that just over a half believed that tourism contributed to climate change (Tiller & Schott, 2013). However, only a small minority changed their travel behavior as a result. Bergin-Seers and Mair's (2009) interviews with 166 tourists in Australia identified just over 60% as "green consumers" but this had little effect on their travel choices. Therefore, it seems that, although the public is concerned about climate change, many tend not to perceive a link with tourism and are not changing their travel decisions or demanding climate change action at their holiday destinations.

Looking more specifically at tourism operators, a study of tour boat operators in seven destinations in Australia found that the majority were unaware that their operations could cause environmental impacts and "the idea that GHG emissions and climate change could affect day to day operations was nonexistent" (Byrnes & Warnken, 2006, p. 268). By contrast, most of the 43 rural New Zealand tourism entrepreneurs interviewed by Hall (2006) identified climate change as a potential impact on their tourism business, but specified a number of other issues that were of more immediate concern and took priority in their business decisions. Any environmental actions focused more on efficiency and conserving scarce resources than responding to climate change. The majority of 19 tourism managers surveyed by Belle and Bramwell (2005) in Barbados were aware of the potential environmental impacts of climate change on local tourism resources, but not as many were aware of the

potential impact on tourist demand. They were inclined to place more emphasis on policy formulation and increasing public awareness as a response to climate change than on implementing mitigation strategies in their businesses. Su et al.'s (2013) survey of 45 Taiwanese hotel operators found that, although the majority expected climate change to cause negative impacts for tourism, they did not consider their hotel contributed to the problem and were only mildly in agreement with taking action.

A survey of 82 marine tourism operators on the Great Barrier Reef (GBR), Australia, found that less than half (41%) saw climate change as the major environmental threat to the GBR, but taking action to reduce climate change impacts was considered important by 78% of operators (Zeppel, 2012a). However, only a third saw this as the responsibility of the operators themselves, while 43% attributed this responsibility to government. Gössling and Schumacher's (2010) interviews with 13 accommodation managers in the Seychelles revealed high levels of awareness of climate change, but some managers placed emphasis on climate change affecting tourism whereas others focused on tourism contributing to climate change. However, many recognized that measures were needed for their businesses to be more ecofriendly and reduce GHG emissions. Although these studies are relatively few in number, the more recent results tend to indicate that tourism operators are becoming aware of the link between climate change and tourism and are realizing the need for action to reduce emissions and protect their businesses.

#### *Carbon Mitigation Actions by the Tourism Industry*

To date there has been relatively little research on mitigation actions that tourism operators are taking. However, a study of 220 small and medium-sized enterprises across a number of business sectors in the UK revealed that many were adopting ecoefficiency and carbon reduction measures (Revell, Stokes, & Chen, 2010). The most popular measures were recycling and minimizing waste, and energy-reducing actions such as turning down heating, turning off appliances, and monitoring energy and water use. Some were also attempting to reduce carbon emissions by avoiding unnecessary travel, promoting alternative transport for staff,

and using low emission vehicles. The few tourism studies have produced disparate results. Vernon et al.'s (2003) study of 25 tourism microbusinesses in Cornwall, UK, found that, despite a lack of formal environmental management strategies, most businesses had adopted some informal measures mainly in traditional areas of waste reduction and energy and water conservation. Similarly, despite low numbers of GBR tourism operators believing it was their responsibility to take action on climate change, the majority had initiated a variety of carbon mitigation measures (Zeppel, 2012a). The main climate actions adopted by over 80% of operators were: recycling, risk management, responsible waste disposal, and reducing energy use. Half had also measured their carbon footprint and more than a third had taken part in climate change workshops or sought web-based information. Another study, based on interviews with 48 owners and managers of reef tourism enterprises, found 91% set targets for energy conservation and fuel efficiency on boats, while 66% had office energy reduction targets, but only 27% offset emissions (Biggs, Ban, & Hall, 2012). Only a third of reef operators provided information to their guests on energy efficiency (34%) and offsetting travel emissions (29%). Coles and Zschiegner (2011) found that accommodation providers in Southwest England had initiated an average of 8.2 mitigation actions, with close to 95% adopting recycling behavior, over 80% installing insulation, and 67% adopting energy-efficient appliances. However, membership of tourism networks did not increase the uptake of carbon actions, with managers using local knowledge, workshops, and the Internet. A survey of 217 lodging providers in the US found an environmental policy only led to higher adoption rates for half of green practices, with minimal use of keycards for power use (Nicholls & Kang, 2012).

By contrast, a study of 52 tourist resorts and hotels in the Cairns region of Queensland, Australia, revealed that more than half of the businesses had made no attempt to adopt energy efficiency measures (Curtis, 2002). While the remainder had made some attempt, only 4% overall had made a significant effort and only 11.5% used renewable energy sources. A study by Dalton et al. (2007) found similarly low levels of uptake of renewable energy at just 9% of 108 accommodation providers

surveyed throughout Queensland. Coles and Zschiegner (2011) also obtained similar results for uptake of green energy sources by accommodation providers in the UK. Becken's (2012) energy survey of New Zealand accommodation businesses found that, despite high levels of awareness about energy efficiency, their levels of implementation were quite low. Measures implemented ranged from the most popular of energy-efficient lighting at 23% to energy saving transport at just 2%. The 45 Taiwanese hotels surveyed by Su et al. (2013) also had low overall implementation rates of carbon mitigation responses, with energy reduction, locally produced and seasonal food, and waste reduction the only actions adopted more widely.

Nelson (2010a) examined the websites of 50 Eco-Certified accommodation providers in Australia, the aim being to identify whether they were providing information about their energy efficiency and carbon reduction measures to potential tourists. Findings revealed that less than half provided this information on their website. Most of this group indicated that their goal was to reduce energy consumption, but only a quarter specified actions to achieve this. Energy efficiency measures were specified by one third of businesses, while alternative energy sources were cited by 18%. Only 6% of businesses specified they participated in carbon offset programs. As this was website information only, it cannot be discounted that some operators may have implemented measures but did not promote them on their websites, particularly as the businesses were all Eco Certified. However, Nelson (2010a) notes that, although Ecotourism Australia's standards for Eco Certification included maximizing energy efficiency and minimizing greenhouse gas emissions, they were only a minor part of the certification process that focused more heavily on nature conservation and education. A review of energy issues for accommodation in Dominica found that while operators were motivated by environmental sustainability, some key barriers were the cost of energy and a lack of knowledge about alternative energy options (Nelson, 2010b). A website analysis of 150 large hotel companies worldwide revealed that only 27 specified their commitment to addressing climate change or reducing carbon emissions, and just 22 provided details of carbon reduction initiatives they had implemented (De Grosbois

& Fennell, 2011). The major focus was on energy reduction and efficiency measures, and using renewable energy resources.

Weaver (2011) is critical about the efforts of many operators, which focus on superficial actions such as linen reuse and recycling; they provide a veneer of corporate responsibility while delivering cost savings to operators, but place the onus on the tourist rather than the operator. He suggests these responses are in line with public sentiments inasmuch as there is little demand by consumers for climate change action. However, Scott (2011) notes that “dealing with climate change is increasingly considered a prerequisite to sustainable development” (p. 27). In fact, he cites the Carbon Disclosure Project’s 2010 survey, which found that the majority of Global 500 and S&P 500 companies believed that addressing climate change and sustainability issues will lead to new commercial opportunities and improved relations with customers and other stakeholders. It therefore seems that economic motives may drive adoption of climate change actions by larger companies. However, other more altruistic motives such as environmental concern may also play a role in climate mitigation actions.

#### *Motivations for Carbon Mitigation Measures*

Little tourism research has been conducted specifically with regard to climate change and operator motivations for adopting carbon mitigation practices. Research on business in general, and the tourism industry in particular, has focused on motivations for adopting sustainable, green, or environmentally responsible practices. As carbon reduction actions comprise a large proportion of these practices, this research is used as a basis for our analysis.

According to Bansal and Roth (2000), four drivers of corporate environmental responsiveness have been identified in prior research, namely “legislation, stakeholder pressures, economic opportunities, and ethical motives” (p. 718). Firms are keen to comply with environmental legislation to avoid penalties, fines, and legal costs. Stakeholders, such as customers, local communities, and environmental groups, also influence corporate decisions on ecological matters. Economic opportunities are at the

heart of corporate decision making, and cost savings, green marketing, and improved reputation are all components of this key motive. Ethical motives, based on leadership values and social obligations, also drive ecological initiatives. Bansal and Roth’s (2000) research of 53 large corporations in a number of countries built on this research to develop a model of corporate ecological responsiveness and identified three motivations for firms adopting ecologically responsive initiatives: (1) competitiveness—improve profitability through cost savings, reputation enhancement, or marketing, (2) legitimation—comply with regulations and societal norms or stakeholder pressure, and (3) ecological responsibility—consider ethical aspects of action and “do the right thing” rather than act out of self-interest. Interestingly, these three motivations match the economic, social, and environmental dimensions of sustainability. Bansal and Roth (2000) also identified three “contextual dimensions” (p. 728) or catalysts for these motivations: (1) issue salience—certainty, transparency, and emotivity, (2) field cohesion—network connections within an organizational sector, and (3) individual concern—the level of concern of organization members for the natural environment and the discretion they have to act. Sheldon and Park (2011) found most US travel businesses engaged in CSR activities, mainly environmental projects, to enhance their reputation and community profile.

Revell et al.’s (2010) study of UK small and medium-sized enterprises across a number of industry sectors identified motivations for mitigation measures similar to those identified in Bansal and Roth’s (2000) model. The biggest drivers for adopting ecofriendly practices were costs savings and attracting new customers (competitiveness), government regulations and taxes (legitimation), and owner–manager’s personal environmental concern (ecological responsibility). With regard specifically to tourism enterprises, Vernon et al. (2003) found the most common motive was reducing costs. Environmental concern was also a consideration but there was a limit to operators’ altruism if it could not be financially justified. Zeppel (2012a) noted that boat modifications by one of the GBR marine tourism operators, which professes a zero carbon footprint, was motivated by the desire to “(1) enhance passenger capacity and comfort,

(2) reduce fuel costs, (3) reduce emissions, and (4) improve climate action credentials” (p. 3), again a mix of competitiveness, legitimation, and ecological responsibility. Although Mair and Jago (2010) developed a more complex model of drivers and barriers that influence “corporate greening” (p. 84), their interviews with business events stakeholders, such as convention centers and conference organizers, revealed that the primary motives of this sector for implementing environmentally sustainable measures also matched Bansal and Roth’s (2000) categories. These motives were the environmental commitment of individuals (ecological responsibility), gaining a commercial advantage by emphasizing their green credentials (competitiveness), complying with corporate social responsibility policies, and preempting future green regulations (legitimation).

This article builds on these previous tourism studies of operators’ motivations for adopting eco-friendly practices and analyzes the responses of environmentally certified tourism enterprises in terms of Bansal and Roth’s (2000) model of corporate ecological responsiveness. It also considers behavioral engagement by operators as “actions that are undertaken when an individual chooses to invest personal resources (e.g., time, money, energy, etc.) into efforts to address the climate change issue” (Sutton & Tobin, 2011, p. 895).

### Methodology

This article presents results from a survey of environmentally certified Queensland tourism enterprises, identified from website listings of members of certification programs. These programs included Eco Certification and Climate Action Certification (Ecotourism Australia); Earth Check; Green Globe; Eco Friendly Star accommodation (AAA Tourism); ecoBiz accreditation; Planet Safe Partnership; and Savannah Guides in North Queensland. The Eco Friendly Star and Earth Check certifications are mainly used by accommodation properties, while the other environmental certification programs are adopted by a range of tourism sectors. These certification schemes promote a range of ecoefficiency actions in energy, water, and waste reduction.

The methodology to develop the survey used in this study comprised two steps. First, a website

review of Tourism Queensland and other government tourism agencies in Australia was undertaken to determine what advice and information they were providing for tourism industry stakeholders with regard to climate change, carbon abatement, green business, and sustainability practices (Zeppel & Beaumont, 2011). Secondly, the websites of ecotourism-certified operators were also reviewed for their carbon mitigation actions, along with the green business practices recommended in ecocertification programs, and the ecoefficiency (i.e., energy, water, waste) measures listed in Tourism Queensland’s environmental indicators benchmark survey in 2010 (Tourism Queensland, 2010a, 2010b). This review provided the basis for our tourism operator survey, including a list of 18 carbon mitigation actions, along with other questions about operator motives for emissions reduction actions. There were 24 questions in the final survey in three main sections: your tourism business, climate change (emission audits and mitigation actions), and carbon offsetting. The survey was piloted with five nature-based Queensland tourism operators without environmental certification. This article reports on climate change and carbon mitigation responses in the survey.

The survey of environmentally certified Queensland tourism operators was undertaken from January to October 2011. Tourism operators with environmental credentials or accreditations were the target group for this survey as environmental certification programs recommend a range of carbon mitigation actions for operators to implement. This research focused on environmentally certified tourism enterprises that were proactive in adopting ecoefficiency measures, to determine their level of adoption of carbon reduction practices. This generated baseline data for future research to compare these responses with carbon mitigation actions adopted by non-environmentally certified tourism businesses.

Website databases listing certified members provided details of the environmentally certified tourism operators in Queensland. The survey was sent to 380 tourism operators by e-mail or post, followed up with phone calls and some personal interviews. Operators primarily self-completed the survey electronically or on a hard copy form, with a small number of surveys based on face-to-face or

phone interviews. Out of 380 operators contacted, some 83 surveys were completed by environmentally certified Queensland tourism enterprises, with a response rate of 25%. This response rate and number of respondents compare favorably with other research on this topic reviewed in this article (e.g., Becken, 2012; Belle & Bramwell, 2005; Biggs et al., 2012; Coles & Zschiegner, 2011; Curtis, 2002; Dalton et al., 2007; Eijgelaar et al., 2010; Gössling & Schumacher, 2010; Hall, 2006; Nelson, 2010a; Su et al., 2013; Vernon et al., 2003; Zeppel, 2012a). Similar response rates were obtained by Becken (2012) of 27%, Eijgelaar et al. (2010) of 21%, and Becken, Frampton, and Simmons (2001) of 19%. A study of green practices at Taiwanese hotels was based on a survey of 45 hotels (Su et al., 2013), while Curtis (2002) surveyed the energy practices of 52 Queensland resorts and hotels, Vernon et al. (2003) researched the environmental strategies of 25 tourism microbusinesses in the UK, and Driscoll, Mansfield, and Strasdas (2007) surveyed the mitigation and offsetting actions by 67 US operators.

The survey results were analyzed with descriptive statistics and frequency distributions of responses, supported by written comments by tourism operators about the relevance of various carbon mitigation measures. Comparisons have been made between the different types of tourism enterprises, but because of small numbers in some categories it was not possible to conduct statistical tests on the data. Key themes have been identified in the comments by tourism operators about the types of carbon mitigation measures adopted.

## Results

### *The Environmentally Certified Tourism Enterprises*

A profile of the 83 environmentally certified Queensland tourism enterprises that responded to the carbon mitigation survey is shown in Table 1. Respondents included: accommodation businesses (40), tour operators (31), attractions (8), convention centers (3), and one tourism organization. These tourism enterprises were mainly located in the key nature-based reef and rainforest destinations of Northern and Central Queensland, and around conservation reserves or rural areas in Southern

Queensland. The respondents also included 16 marine tourism enterprises such as diving, kayaking, sailing, whale watching, and a reef aquarium. The accommodation businesses and convention centers in this study were located in Brisbane, Cairns, and the Gold Coast. Geographically, most tourism enterprises were located in coastal and hinterland areas of Northern (46%) or Southern (43%) Queensland followed by Central Queensland (11%). The surveyed tourism enterprises were: small businesses

Table 1  
Profile of Environmentally Certified Queensland Tourism Enterprises

Type of business	
Accommodation ( <i>n</i> = 40)	48%
Tour operator ( <i>n</i> = 31)	37%
Attraction ( <i>n</i> = 8)	10%
Convention center ( <i>n</i> = 3)	4%
Tourism organization ( <i>n</i> = 1)	1%
Size of business	
Small business: 1–4 staff ( <i>n</i> = 33)	40%
Medium business: 5–20 staff ( <i>n</i> = 24)	29%
Large business: over 21 staff ( <i>n</i> = 26)	31%
Role in tourism business	
Owner/operator ( <i>n</i> = 45)	54%
Manager ( <i>n</i> = 25)	30%
Other <sup>a</sup> ( <i>n</i> = 13)	16%
Age of business	
Accommodation: 1–78 years, mean	17.4
Tour operator: 2–38 years, mean	15.4
Attraction: 3–75 years, mean	16.7 <sup>b</sup>
Convention center: 7–16 years, mean	12.6
Tourism organization: 42 years	
Business certification <sup>c</sup>	
Eco Certification ( <i>n</i> = 58)	70%
Eco Friendly Star ( <i>n</i> = 14)	17%
Earth Check ( <i>n</i> = 13)	16%
Climate Action Certification ( <i>n</i> = 9)	11%
Green Globe ( <i>n</i> = 8)	10%
Planet Safe Partnership (TTNQ) ( <i>n</i> = 8)	10%
AAA Tourism ( <i>n</i> = 8)	10%
TAAL ( <i>n</i> = 7)	8%
Savannah Guides ( <i>n</i> = 5)	6%
ISO14001 EMS ( <i>n</i> = 3)	4%
Other <sup>d</sup> ( <i>n</i> = 7)	8%

TTNQ, Tourism Tropical North Queensland; AAA, Australian Automobile Association; TAAL, Tourism Accreditation Australia Limited; CRVA, Caravan RV & Accommodation Industry of Australia.

<sup>a</sup>Other: environmental, business, operational, venue staff.

<sup>b</sup>Mean excludes one attraction operating for 120 years.

<sup>c</sup>Percentages add to more than 100 because some operators were certified in multiple programs.

<sup>d</sup>Other certification: Marine Safe (2), CRVA/Gumnut (2), ecoBiz (1), Respect our Culture (1), Nature Refuge (1).

with one to four staff (40%); medium businesses with 5 to 20 staff (29%); and large businesses with over 21 staff (31%). Mainly owner/operators (54%) or managers (30%) completed the survey, followed by operations staff (16%).

*Attitudes to Climate Change and Reducing Carbon Emissions*

The majority of the surveyed environmentally certified tourism enterprises (88%) agreed that climate change was an important issue for the tourism industry. A few operators (10%) thought climate change may be an important tourism issue, while one operator each stated “not sure” and “no” on this. The “no” respondent believed climate change was a natural process over millions of years, while the “not sure” respondent commented there were “two extremes to the argument. No apparent middle ground.” Comments by those that responded “maybe” indicated they wanted more research, were unsure about causes, or the credibility of climate information. They also referred to customer perceptions of climate change, preference for environmentally friendly practices, or buying tourism products on price as more important factors for tourism. Operators that agreed with climate change being an important tourism issue referred to impacts on the reef, weather, wildlife, and nature-based destinations; protecting the environment; customer and industry expectations of sustainable tourism practices; the impact of rising energy costs; and the necessity for tourism businesses to adopt ecoefficiency measures. A few respondents also commented on the carbon footprint of travel and the impact of a carbon tax. One reef tour operator stated, “Climate change will affect us all but correct reporting is important to prevent hysteria, its being over marketed and desensitizing pax [passengers].”

Most tourism enterprises (87%) either strongly agreed (53%) or agreed (34%) that it was important to reduce the carbon footprint and emissions of their tourism business. Nine operators (11%) were neutral on this point, one noting that their resort development was based on being ecologically sustainable. One accommodation manager strongly disagreed with this point, did not think climate change was important, and their only ecoefficiency

measure was the installation of CFL bulbs at their property solely motivated by cost savings.

Just over 40% of tourism businesses had completed an audit of their carbon emissions/energy usage, either with an online emissions calculator (23%) or by employing a consultant to audit their emissions (18%). One attraction had an energy company do an audit of their emissions. Another 34% of tourism operators planned to do an emissions audit in the next 12 months, while 28% did not think an emissions audit was necessary for their business. One stated they would “rather spend \$ on action rather than audits,” while another commented “not required—NGERS calculator reported that our emissions level was below the threshold.” The online calculators that were used by tourism businesses to assess their carbon emissions included: ClimateSmart (*n* = 8), GBMPA (*n* = 7), ecoBiz (*n* = 4), NGERS (*n* = 3), Greenfleet (*n* = 2), and Greenhouse Challenge Plus (*n* = 2). Other emissions calculators used were by Earth Check/EC3 Global (*n* = 7), including a Gold Coast City Council pilot project that utilized Earth Check software, Tourism Queensland (*n* = 2), and the Sustainable Regions Program (*n* = 1).

Many of the tourism enterprises had undertaken carbon reduction or green business training. The main types of training are listed in Table 2. Other types of green business learning were from forums and seminars, the Nature Refuge program, World Heritage listing, EC3 Global, Gumnut awards for caravan parks, involvement in university research on ecosystem services, responsible business training,

Table 2  
Carbon or Green Business Training Undertaken by Queensland Tourism Enterprises

TQ Climate Change Workshop ( <i>n</i> = 22)	27%
ecoBiz Workshop ( <i>n</i> = 11)	13%
Climate Smart Business ( <i>n</i> = 11)	13%
TQ Sustainable Regions Program ( <i>n</i> = 9)	11%
TQ Climate Futures Workshop ( <i>n</i> = 9)	11%
Qantas Sustainable Tourism Seminar ( <i>n</i> = 8)	10%
AMPTO Acclimatise Your Business Workshop ( <i>n</i> = 5)	6%
EPA Low Carbon Diet ( <i>n</i> = 4)	5%
Greenhouse Challenge Plus ( <i>n</i> = 4)	5%
A-Z of Going Green-MEA ( <i>n</i> = 1)	1%

TQ, Tourism Queensland; AMPTO, Association of Marine Park Tourism Operators; EPA, Environmental Protection Agency; MEA, Meetings & Events Australia.

and the Sustainable Scenic Rim’s low carbon programs in southeast Queensland. One large rainforest attraction provided environmental awareness training for staff and contractors. Two operators indicated that they had no training in this area as they were small and were unable to travel away.

*Carbon Mitigation Practices*

Environmentally certified Queensland tourism operators have adopted a range of carbon mitigation practices (Table 3). These include lower cost energy efficiency measures such as CFL or LED lighting (94%) and low-energy appliances (83%), and reducing energy use practices such as turning off standby power (73%). Recycling and reducing solid waste (90%) was also a key measure. More than half of the tourism enterprises were training staff (58%) or informing visitors about reducing carbon emissions (53%). Less than half of all surveyed operators have installed roofing insulation (47%), use room fans

(46%), operate new fuel-efficient transport (39%), choose green suppliers (46%), or market their green actions (42%). About a quarter of tourism operators have installed solar power, use solar/heat pump hot water heaters, implement other energy initiatives like conserving water, minimizing energy use, gas heating or renewable energy, or carbon offset. Only a few tourism enterprises are using biofuels or driving electric/hybrid-electric vehicles.

One caravan park operator used electric golf buggies to service sites within their premises. A few larger tourism businesses (12%) are purchasing GreenPower from renewable energy. One accommodation owner stated, “Would invest in ‘Green Electricity’ but currently way too expensive; cost should be at least on par with normal tariff rates.” A few enterprises stated they lacked staff resources or had difficulty in measuring/calculating their carbon footprint.

Other energy initiatives by attractions included: we operate solely on renewable power—hydro and

Table 3  
Carbon Mitigation Actions Implemented by Queensland Tourism Enterprises

Install energy-saving CFL bulbs or LED lights ( <i>n</i> = 78)	94%
Practice recycling and minimize amount of solid waste ( <i>n</i> = 75)	90%
Purchase energy-efficient appliances ( <i>n</i> = 69)	83%
Switch off appliances at the wall to reduce standby power ( <i>n</i> = 61)	73%
Train staff or volunteers on your emissions reduction actions ( <i>n</i> = 48)	58%
Provide information to visitors on reducing their emissions ( <i>n</i> = 44)	53%
Roofing insulation ( <i>n</i> = 39)	47%
Choose suppliers taking actions to reduce their emissions ( <i>n</i> = 38)	46%
Use room fans instead of air conditioners ( <i>n</i> = 38)	46%
Market the emissions reduction initiatives of your business ( <i>n</i> = 35)	42%
Operate new fuel-efficient vehicles or vessels ( <i>n</i> = 32)	39%
Other energy initiatives <sup>a</sup> ( <i>n</i> = 22)	27%
Carbon offsetting ( <i>n</i> = 21)	25%
Use solar or heat pump hot water waters ( <i>n</i> = 21)	25%
Install solar photovoltaic power <sup>b</sup> ( <i>n</i> = 20)	24%
Use ethanol mix or biofuels in vehicles ( <i>n</i> = 14)	17%
Drive electric cars or hybrid–electric vehicles ( <i>n</i> = 12)	14%
Purchase Green Power electricity from renewable energy ( <i>n</i> = 10)	12%

<sup>a</sup>Other initiatives implemented: Attractions—instant gas hot water service, reduce water consumption; we operate solely on renewable power (hydro and solar); bore water, rainwater, plant trees, conservation message delivered on tours; solar pumps, rainwater tanks for toilet, building design to allow max. natural light, system that regulates AC to optimum. Tour operators—driving practices reduce emissions; gas hot water heater and optimizing two generators; purchase all four-stroke outboard motors; 200,000 liters of rainwater for washing buses, installed oil/water separator. Accommodation—low emission gas heating hot water and cooking; TQAL grant for two solar-powered cabins; low-pressure water system; flow restrictors, water harvesting, local product, movement sensors, drought-resistant plants; rainwater tanks.

<sup>b</sup>Attraction—“we are about to install 150KW of PV power”; Tour operators—“having a look at solar systems on boat to supplement generator”; “in the future planning to do so”; Accommodation—grant for two solar powered cabins.

solar; solar pumps, instant gas hot water service; system that regulates AC (air conditioning) to optimum; and building design to allow maximum natural light. Energy initiatives by tour operators included: driving practices to reduce emissions; gas hot water heater and optimizing two generators; and purchase all four-stroke outboard motors. Energy practices at accommodation businesses included: low emission gas heating—hot water and cooking; TQAL grant for two solar-powered cabins; movement sensors; and local products. The water initiatives reported by tourism enterprises included: reduce water consumption; bore water; rainwater; and rainwater tanks for toilet (attractions); 200,000 liters of rainwater for washing buses, installed oil/water separator (tour operator); low-pressure water system; flow restrictors; water harvesting; rainwater tanks; and drought-resistant plants (accommodation). These other ecoactions focused on water and energy efficiency measures.

Overall, the average number of actions adopted by the tourism enterprises was nine. Convention centers were the most proactive, adopting 11 actions on average, followed by attractions (10), accommodations (8), and tour operators (7). Larger enterprises, and fixed location businesses, were most likely to be implementing a range of carbon reduction actions.

*Motivations for Implementing Carbon Mitigation Practices*

The survey results indicate the main reasons for implementing carbon reduction initiatives at environmentally certified tourism businesses (Table 4) were:

- Attract environmentally aware tourists to your business (82%)
- Differentiate your business as a “climate friendly” tourism product (81%)
- Cost savings (71%)
- Certification or permit requirement (63%)
- Environmental regulations (36%), and
- Other reasons (335%)

Environmental and business motivations were most important, followed by cost savings and complying with certification requirements, where ecoefficiency actions were integral to these schemes. The

Table 4  
Motivations for Carbon Mitigation by Queensland Tourism Enterprises

---

Unranked list of motivations for carbon mitigation actions

- Attract environmentally aware tourists to your business (*n* = 68)
- Differentiate your business as a “climate friendly” tourism product (*n* = 67)
- Cost savings (*n* = 59)
- Certification or permit requirement (*n* = 52)
- Environmental regulations (*n* = 30)
- Other<sup>a</sup>: Environmental ethic, CSR, Customer demand, Role model, No mains power (*n* = 29)
- Business reporting legal requirement (*n* = 4)

Operator motives ranked from 1 (highest) to 4 (lowest):

- Top six factors
- Other<sup>a</sup>: Environmental ethic, CSR, Customer demand, Role model, No mains power (1.74)
- Cost savings (2.32)
- Attract environmentally aware tourists to your business (2.37)
- Differentiate your business as a “climate friendly” tourism product (2.39)
- Environmental regulations (2.70)
- Certification or permit requirement (2.77)

---

<sup>a</sup>Other: Environmental ethics/right thing to do/CSR/green/sustainable/reduce carbon footprint (*n* = 21); personal choice, management efficiency/edict, customer demand/role model, no mains power (*n* = 6). CSR, Corporate Social Responsibility.

other reasons stated by tourism operators related to their personal environmental ethic, corporate social responsibility, customer demand, being a role model, and no mains power. Comments included: “want to be green; want to make a difference; passionate about the beautiful earth and nature we live in; philosophical—it is the right thing to do; to help our environment; do the right thing; management company edict; guests today and in the future will come to expect operators to be doing the “right thing” by the environment; and acting as a role model for other tourism operators and local residents.” One attraction was “reinstating heritage values by refurbishing original 1930s hydro” to reduce electricity charges. A few larger enterprises (5%) mentioned a business reporting legal requirement, such as carbon emission thresholds in the National Greenhouse Energy Reporting System (NGERS). Environmental ethics was a stronger motive for ecoactions by smaller owner-operated enterprises, such as boutique accommodation and nature tours.

When responses for carbon reduction actions were ranked by tourism operators from 1 (highest) to 4 (lowest), the first ranked response was: Other reasons, mainly related to environmental ethics of owner-managers, with cost savings from ecoefficiency actions ranked second (Table 4). The third and fourth ranked reasons were attracting environmentally aware tourists to the business, and being recognized as a climate friendly tourism enterprise. Lower ranked reasons for carbon reduction actions were environmental regulations and permit or certification program requirements (e.g., Ecotourism, Climate Action). Hence, carbon reduction actions were largely driven by environmental ethics and business goals.

### Discussion

Almost 90% of the environmentally certified Queensland tourism operators believed that climate change was an important issue for tourism and this growing awareness aligns with the recent results of Gössling and Schumacher (2010), Hall (2006), Su et al. (2013), and Zeppel (2012a). However, as found by this previous research, much of the focus was on the effects of climate change on the environment and consequent impacts on tourism businesses such as rising costs and changes in tourist demand, rather than on tourism's contribution to the issue. There was also some uncertainty and skepticism about the climate change issue by surveyed operators as Turton et al. (2010) noted. However, many saw the need for reducing the industry's contribution to climate change and this was borne out by the overwhelming majority (87%) agreeing that it was important to reduce the carbon emissions of their tourism businesses. This was a surprising contrast with Zeppel's (2012a) review, which found only one third of tourism operators in the GBR saw it as their responsibility to take action, and Belle and Bramwell's (2005) study, which found Barbados tourism managers emphasized policy formulation and increasing public awareness as a response rather than adopting mitigation strategies. The widening publicity given to the climate change issue via Australian government and international publications, and the support and information on the topic provided by Tourism Queensland as identified by Zeppel and Beaumont

(2012b) may be responsible for these attitudes and increased uptake of carbon mitigation measures. Of course, all participants in this study were environmentally certified and therefore have the necessary support in meeting requirements of their certifying body for ecoefficiency, which may also be a key factor. However, as noted by Nelson (2010a), the focus for Eco Certification tends to be more on nature conservation and education than on reducing greenhouse gas emissions. Many surveyed operators had undertaken green business training but fewer had completed an emissions or energy audit, and this may be due to the relatively small size of many of these businesses. Half of the respondents were owner-operated businesses. As noted by one operator, they would rather spend their money on mitigation actions than on external audits.

On average, the tourism enterprises undertook nine actions to reduce their emissions, and convention centers were the most proactive with an average of 11. Again, this may be a factor of size, with the three convention centers all being classified in the "large business" category. They were also the newest of the businesses with an average age of 12.6 years, and the fact that they were established in a period when climate change and sustainability issues were becoming more prominent may also be pertinent. Larger enterprises, and fixed location businesses, were most likely to be implementing a range of carbon reduction actions.

The Queensland tourism enterprises adopted a range of carbon mitigation actions in the four categories identified by Becken and Hay (2007) of reducing energy use, improving energy efficiency, increasing the use of renewable energy sources, and sequestering carbon through sinks. As found in earlier research (Becken, 2012; Biggs et al., 2012; Coles & Zschiegner, 2011; De Grosbois & Fennell, 2011; Nelson, 2010a, 2010b; Revell et al., 2010; Su et al., 2013; Vernon et al., 2003; Zeppel, 2012a), the most popular were energy efficiency measures, such as installing energy-saving lighting and purchasing energy-efficient appliances, and reducing energy use measures, such as recycling and minimizing waste, and adopting and encouraging energy-conserving behavior. These were the easier measures to adopt and those that would provide immediate cost savings to operators for little or no outlay, perhaps conforming to Weaver's (2011)

perceptions regarding superficial actions on climate change mitigation adopted by many tourism operators. Less popular measures were increasing the use of renewable energy sources and sequestering carbon through sinks (carbon offsetting), which are more expensive to initiate and implement and would only deliver returns over a longer time frame. However, the finding that a quarter of respondents were using renewable energy sources was a substantial increase on the levels found by Curtis (2002), Coles and Zschiegner (2011), and Dalton et al. (2007). It was also higher than Nelson's (2010a) results of similarly certified operators, and indicated a progression in the uptake of renewable energy sources by tourism enterprises during the period 2002–2011. A similar result was obtained for carbon offsetting under the "sequestering carbon" category, with an increase from 6% participating in a carbon offsetting program in Nelson's (2010a) results to 21% in this study. However, as noted previously, Nelson's figures may have underestimated the actual uptake of these actions as they were based on website information only. More than half of the surveyed operators in the present study also provided information to visitors on reducing their emissions.

The motives for carbon mitigation measures identified by the environmentally certified tourism enterprises match the categories of Bansal and Roth's (2000) model of corporate ecological responsiveness of competitiveness, legitimation, and ecological responsibility, and accord with the findings of Mair and Jago (2010), Revell et al. (2010), and Zeppel (2012a). The highest numbers of surveyed tourism enterprises specified three "competitiveness" motives designed to improve their economic opportunities and profitability, namely differentiating their business as "climate friendly," attracting environmentally aware tourists to their business, and cost savings. Slightly fewer specified "legitimation" motives of complying with certification or permit requirements and environmental regulations. A smaller number had motives in the "ecological responsibility" category identified as environmental ethics from a range of comments in "other" motives such as "do the right thing," "want to be green," and "help our environment." However, when asked to rank their motives, the largest number of tourism operators placed

environmental ethics in first place, along with differentiating their business as "climate friendly" and cost savings. This is particularly interesting inasmuch as the other two motives were specified as a choice in the survey whereas the environmental ethics response came entirely from operators' own free choice response without prompting. Environmental ethics was also a stronger motive for ecoactions by smaller owner-operated enterprises, such as boutique accommodation and nature tours. From the rankings, it would seem that competitiveness and ecological responsibility are the primary motives and that, despite being environmentally certified tourism operators, complying with their certification requirements (legitimation) is not as important as other motives. In fact, the environmental concern and ethics of these tourism operators may be what prompted them to become environmentally certified in the first place.

The contextual dimensions of Bansal and Roth's (2000) model are also evident as catalysts for these motives. The first dimension, issue salience, would appear to be a factor in driving carbon reduction actions. With regard to certainty and transparency, the scientific and business communities are now largely in agreement on the science and causes of climate change as evidenced by the growing body of academic research and publications by government and industry bodies. Emotivity is also relevant, as the increasing volume of media publicity about climate change has elicited a strong emotional response in both the public and the business community about the issue. The second dimension, field cohesion, is also a factor in that the network connections of the industry as members of their certification bodies and the responses of government tourism agencies have led to dissemination of relevant climate change information among the operators and portrayal of the industry response as sustainable. Individual concern is a key factor, as the findings indicate high levels of concern for the environment, particularly among those who are in a position of owner or manager and therefore able to make decisions to implement carbon mitigation actions. Hence, the behavioral engagement by tourism operators involves the investment of time, money, and resources into carbon actions that address the climate change issue (Sutton & Tobin, 2011).

With regard to competitiveness, cost savings for larger operators from ecoefficiency actions have already been quite substantial. However, it is not clear whether marketing their business as “climate friendly” and attempting to attract environmentally concerned tourists to their businesses will pay further dividends. Although the public believes that climate change is a serious problem, prior research has found that these concerns do not influence their travel behavior or demand for ecofriendly holiday destinations (Becken, 2007; Bergin-Seers & Mair, 2009; Cohen & Higham, 2011; Eijgelaar et al., 2010; Gössling & Schumacher, 2010; Higham & Cohen, 2011; McKercher et al., 2010; Tiller & Schott, 2013). However, the recent research by Cohen and Higham (2011) suggests an increasing number of travelers with a “carbon conscience” may demand these actions by operators in the future.

### Conclusion

This article applied Bansal and Roth’s (2000) model of corporate ecological responsiveness to assess carbon actions adopted by environmentally certified tourism enterprises in Queensland, Australia. It found the main drivers for adopting ecofriendly practices were: being “climate friendly,” attracting customers, and cost savings (competitiveness); government regulations or certification (legitimation); and owner–manager’s personal environmental concern (ecological responsibility). In general, the environmentally certified tourism enterprises’ responses seem to align with Scott’s (2011) contention that dealing with climate change is now an integral part of the sustainable development process. They may have been prompted to act by environmental ethics and cost savings from energy efficiency measures, but they also believe that acting responsibly will lead to new commercial opportunities and improved relations with customers. Environmental regulations and tourism certification requirements are other drivers for carbon actions. This study surveyed environmentally certified tourism operators and one could expect this group of businesses to be more proactive in adopting ecofriendly and energy efficiency measures than other mainstream tourism businesses. However, respondents in this survey were not primarily motivated to act because of certification

requirements, and the focus of most environmental certification programs is not necessarily on reducing carbon emissions (Nelson, 2010a). Future research on mainstream or non-environmentally certified tourism businesses would provide a useful comparison with this group to determine the level of uptake of carbon mitigation actions across the whole industry.

This research compared the findings on motivations for adopting carbon mitigation actions by Queensland tourism enterprises with other similar tourism studies using Bansal and Roth’s (2000) model of corporate ecological responsiveness. This analysis contributed to the literature by linking tourism findings to general research on corporate social and environmental responsibility. Future research on tourism industry responsiveness to climate change could be based on this model and used to identify whether tourism businesses’ strengths in carbon mitigation actions fall in one or more of the three categories (i.e., competitiveness, legitimation, and ecological responsibility). This research would further test the utility of Bansal and Roth’s (2000) model and confirm the key motivations and drivers for adopting carbon mitigation actions in achieving sustainable tourism at the business level. Barriers for tourism businesses in adopting carbon mitigation actions also need to be identified (Carmody & Zeppel, 2009; Nelson, 2010b) and addressed by government and industry tourism bodies. The relative influence of environmental policies, tourism networks, and informal learning by tourism operators about carbon reduction actions also requires further evaluation.

### References

- Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717–736.
- Becken, S. (2004). How tourists and tourism experts perceive climate change and carbon-offsetting schemes. *Journal of Sustainable Tourism*, 12(4), 332–345.
- Becken, S. (2007). Tourists’ perception of international air travel’s impact on the global climate and potential climate change policies. *Journal of Sustainable Tourism*, 15(4), 351–368.
- Becken, S. (2012). Operators’ perceptions of energy use and actual saving opportunities for tourism accommodation. *Asia Pacific Journal of Tourism Research*, 18(1–2). Published online June 4. DOI:10.1080/110941665.2012.688512.

- Becken, S., & Hay, J. E. (2007). *Tourism and climate change: Risks and opportunities*. Clevedon, UK: Channel View Publications.
- Becken, S., & Hay, J. E. (2012). *Climate change and tourism: From policy to practice*. London: Routledge.
- Becken, S., Frampton, C., & Simmons, D. (2001). Energy consumption patterns in the accommodation sector—the New Zealand case. *Ecological Economics*, 39(3), 371–386.
- Belle, N., & Bramwell, B. (2005). Climate change and small island tourism: Policy maker and industry perspectives in Barbados. *Journal of Travel Research*, 44, 32–41.
- Bergin-Seers, S., & Mair, J. (2009). Emerging green tourists in Australia: Their behaviours and attitudes. *Tourism and Hospitality Research*, 9(2), 109–119.
- Biggs, D., Ban, N. C., & Hall, C. M. (2012). Lifestyle values, resilience, and nature-based tourism's contribution to conservation on Australia's Great Barrier Reef. *Environmental Conservation*, 39(4), 370–379.
- Byrnes, T. A., & Warnken, J. (2006). Greenhouse gas emissions from marine tours: A case study of Australian tour boat operators. *Journal of Sustainable Tourism*, 14(3), 255–270.
- Carmody, J., & Zeppel, H. (2009). Specialist accommodation in North Queensland, Australia: Barriers to implementing environmental management practices. *International Journal of Management and Decision Making*, 10(3/4), 201–213.
- Cohen, S. A., & Higham, J. E. S. (2011). Eyes wide shut? UK consumer perceptions of aviation climate impacts and travel decisions to New Zealand. *Current Issues in Tourism*, 14(4), 323–335.
- Coles, T., & Zschiegner, A.-K. (2011). Climate change mitigation among accommodation providers in the South West of England: Comparisons between members and non-members of networks. *Tourism and Hospitality Research*, 11, 117–132.
- Curtis, I. A. (2002). Environmentally sustainable tourism: A case for carbon trading at Northern Queensland hotels and resorts. *Australian Journal of Environmental Management*, 9, 27–36.
- Dalton, G. J., Lockington, D. A., & Baldock, T. E. (2007). A survey of tourist operator attitudes to renewable energy supply in Queensland, Australia. *Renewable Energy*, 32, 567–586.
- De Grosbois, D., & Fennell, D. (2011). Carbon footprint of the global hotel companies: Comparison of methodologies and results. *Tourism Recreation Research*, 36(3), 231–245.
- Department of Resources, Energy and Tourism. (2008). *Tourism and climate change—A framework for action*. Canberra: Author.
- Department of Resources, Energy and Tourism. (2009). *The climate change guide: Mitigation and adaptation measures for Australian tourism operators*. Canberra: Author.
- Department of Resources, Energy and Tourism. (2011). *Tourism Ministers' Council two-year forward work program. 2011–12 priorities. National long-term tourism strategy*. Retrieved from <http://www.ret.gov.au/>
- Driscoll, L., Mansfield, C., & Strasdas, W. (2007). *Nature tour operators' attitudes and actions concerning travel related greenhouse gas emissions: Summary of results*. Stanford: Center on Ecotourism and Sustainable Development.
- Dwyer, L., Forsyth, P., Spurr, R., & Hoque, S. (2010). Estimating the carbon footprint of Australian tourism. *Journal of Sustainable Tourism*, 18(3), 355–376.
- Dwyer, L., Forsyth, P., Spurr, R., & Hoque, S. (2013). Economic impacts of a carbon tax on the Australian tourism industry. *Journal of Travel Research*, 52(2), 143–155.
- Eijgelaar, E., Thaper, C., & Peeters, P. (2010). Antarctic cruise tourism: The paradoxes of ambassadorship, “last chance tourism” and greenhouse gas emissions. *Journal of Sustainable Tourism*, 18(3), 337–354.
- Gössling, S. (2011). *Carbon management in tourism: Mitigating the impacts on climate change*. Abingdon, Oxon, UK: Routledge.
- Gössling, S., & Schumacher, K. P. (2010). Implementing carbon neutral destination policies: Issues from the Seychelles. *Journal of Sustainable Tourism*, 18(3), 377–391.
- Gössling, S., Scott, D., Hall, C. M., Ceron, J. P., & Dubois, G. (2012). Consumer behaviour and demand responses of tourists to climate change. *Annals of Tourism Research*, 39, 36–58.
- Hall, C. M. (2006). New Zealand tourism entrepreneur attitudes and behaviours with respect to climate change adaptation and mitigation. *International Journal of Innovation and Sustainable Development*, 1(3), 229–237.
- Hall, C. M. (2011). Consumerism, tourism and voluntary simplicity: We all have to consume, but do we really have to travel so much to be happy? *Tourism Recreation Research*, 36(3), 298–303.
- Hall, C. M., & Higham, J. (Eds.). (2005). *Tourism, recreation and climate change*. Clevedon, UK: Channel View Publications.
- Higham, J. E. S., & Cohen, S. A. (2011). Canary in the coalmine: Norwegian attitudes towards climate change and extreme long-haul air travel to Aotearoa New Zealand. *Tourism Management*, 32, 98–105.
- Jopp, R., DeLacy, T., & Mair, J. (2010). Developing a framework for regional destination adaptation to climate change. *Current Issues in Tourism*, 13(6), 591–605.
- Mair, J., & Jago, L. K. (2010). The development of a conceptual model of greening in the business events tourism sector. *Journal of Sustainable Tourism*, 18(1), 77–94.
- McKercher, B., Prideaux, B., Cheung, C., & Law, R. (2010). Achieving voluntary reductions in the carbon footprint of tourism and climate change. *Journal of Sustainable Tourism*, 18(3), 297–317.
- Nelson, V. (2010a). Promoting energy strategies on Eco-Certified accommodation websites. *Journal of Ecotourism*, 9(3), 187–200.
- Nelson, V. (2010b). Investigating energy issues in Dominica's accommodations. *Tourism and Hospitality Research*, 10(4), 345–358.
- Nicholls, S., & Kang, S. (2012). Going green: The adoption of environmental initiatives in Michigan's lodging sector. *Journal of Sustainable Tourism*, 20(7), 953–974.

- Organisation for Economic Co-operation and Development and United Nations Environment Programme. (2011). *Climate change and tourism policy in OECD countries*. OECD Studies in Tourism. Retrieved from <http://www.oecd.org/cfe/tourism/48681944.pdf>
- Queensland Tourism Industry Council. (2008). *Climate change: A brief guide for tourism*. Retrieved from <http://www.qtic.com.au>
- Revell, A., Stokes, D., & Chen, H. (2010). Small businesses and the environment: Turning over a new leaf? *Business Strategy and the Environment*, 19, 273–288.
- Ruhanen, L., & Shakeela, A. (2013). Responding to climate change: Australian tourism industry perspectives on current challenges and future directions. *Asia Pacific Journal of Tourism Research*, 18(1–2), 35–51.
- Schott, C. (Ed.). (2010). *Tourism and the implications of climate change: Issues and actions*. Bingley, UK: Emerald.
- Scott, D. (2011). Why sustainable tourism must address climate change. *Journal of Sustainable Tourism*, 19(1), 17–34.
- Scott, D., & Becken, S. (2010). Adapting to climate change and climate policy: Progress, problems and potentials. *Journal of Sustainable Tourism*, 18(3), 283–295.
- Scott, D., Hall, C. M., & Gössling, S. (2012). *Tourism and climate change: Impacts, adaptation and mitigation*. Abingdon, Oxon, UK: Routledge.
- Scott, D., Peeters, P., & Gössling, S. (2010). Can tourism deliver its “aspirational” greenhouse gas emission reduction targets? *Journal of Sustainable Tourism*, 18(3), 393–408.
- Sheldon, P. J., & Park, S. Y. (2011). An exploratory study of corporate social responsibility in the U.S. travel industry. *Journal of Travel Research*, 50(4), 392–407.
- Su, Y.-P., Hall, C. M., & Ozanne, L. (2013). Hospitality industry responses to climate change: A benchmark study of Taiwanese tourist hotels. *Asia Pacific Journal of Tourism Research*, 18(1–2), 92–107.
- Sustainable Tourism Cooperative Research Centre. (2009). *The impacts of climate change on Australian tourism destinations: Developing adaptation and response strategies*. Gold Coast: Author.
- Sutton, S. G., & Tobin, R. C. (2011). Constraints on community engagement with Great Barrier Reef climate change reduction and mitigation. *Global Environmental Change*, 21, 894–905.
- Tiller, T. R., & Schott, C. (2013). The critical relationship between climate change awareness and action: An origin-based perspective. *Asia Pacific Journal of Tourism Research*, 18(1–2), 21–34.
- Tourism and Transport Forum. (2008). *Responding to climate change: Tourism and transport sector position paper*. Retrieved from <http://www.ttf.org.au/Content/climatechange.aspx>
- Tourism and Transport Forum. (2011). *Carbon tax and tourism & travel—Trade and global warming exposed*. Retrieved from <http://www.ttf.org.au/Content/climatechange.aspx>
- Tourism Queensland. (2010a). *Tourism environmental indicators fact sheet*. Retrieved from <http://www.tq.com.au/>
- Tourism Queensland. (2010b). *Tourism Queensland tourism operators environmental indicators benchmark 2010*. Retrieved from <http://www.tq.com.au/>
- Turton, S., Dickson, T., Hadwen, H., Jorgensen, B., Pham, T., Simmons, D., & Wilson, R. (2010). Developing an approach for tourism climate change assessment: Evidence from four contrasting Australian case studies. *Journal of Sustainable Tourism*, 18(3), 429–447.
- Turton, S., Hadwen, W., & Wilson, R. (Eds.). (2009). *The impacts of climate change on Australian tourism destinations: Developing adaptation and response strategies—A scoping study*. Gold Coast: Sustainable Tourism CRC.
- Vernon, J., Essex, S., Pinder, D., & Curry, K. (2003). The ‘greening’ of tourism micro-businesses: Outcomes of focus group investigations in South East Cornwall. *Business Strategy and the Environment*, 12, 49–69.
- Weaver, D. (2011). Can sustainable tourism survive climate change? *Journal of Sustainable Tourism*, 19(1), 5–15.
- World Tourism Organization, & United Nations Environment Programme. (2008). *Climate change and tourism: Responding to global challenges*. Madrid: Author.
- World Travel and Tourism Council. (2009). *Leading the challenge on climate change*. London: Author.
- Zeppel, H. (2012a). Climate change and tourism in the Great Barrier Reef Marine Park. *Current Issues in Tourism*, 15(3), 287–292.
- Zeppel, H. (2012b). Collaborative governance for low-carbon tourism: Climate change initiatives by Australian tourism agencies. *Current Issues in Tourism*, 15(7), 603–626.
- Zeppel, H., & Beaumont, N. (2011). *Climate change and Australian tourism: A research bibliography* (ACSBD Working Paper No. 1). Springfield, Australia: Australian Centre for Sustainable Business and Development, University of Southern Queensland.
- Zeppel, H., & Beaumont, N. (2012a). Carbon mitigation by Queensland tourism enterprises. *International Journal of Organisational Behaviour*, 17(4), 28–34.
- Zeppel, H., & Beaumont, N. (2012b). Climate change and tourism futures: Responses by Australian tourism agencies. *Tourism and Hospitality Research*, 12(2), 73–88.
- Zeppel, H., & Beaumont, N. (2012c). The new green age: Carbon mitigation by Queensland tourism enterprises. In C. Lade & L. Melsen (Eds.), *CAUTHE 2012 Book of Proceedings: The New Golden Age of Tourism and Hospitality*. Melbourne: La Trobe University.