

# CARBON MITIGATION BY QUEENSLAND TOURISM ENTERPRISES

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## ABSTRACT

This paper reports on carbon mitigation by environmentally certified Queensland tourism enterprises (n=83). The survey results profile attitudes to climate change, emissions auditing, carbon mitigation actions, and motives for emissions reduction. The main reasons for carbon actions were marketing climate friendly tourism, attracting green tourists, and cost savings.

Keywords: carbon mitigation; eco-efficiency; green practices; tourism SMEs; Queensland.

## INTRODUCTION

Climate change and carbon mitigation initiatives are growing issues for the tourism industry. *Mitigation of climate change involves taking actions to reduce greenhouse gas emissions and to enhance carbon sinks* (STCRC, 2009: 5). Green tourism enterprises are implementing eco-efficiency measures in energy, water and waste management to reduce operating costs and carbon emissions. This paper reports on carbon mitigation actions adopted by environmentally certified Queensland tourism operators (n=83). It first reviews climate change and carbon mitigation issues in Australian tourism, along with carbon programs initiated by Tourism Queensland. The paper then presents survey results profiling tourism SME attitudes to climate change, emissions auditing and carbon mitigation actions, and key motives for emissions reduction. It compares tourism sectors and discusses SME motives for adopting carbon mitigation actions.

### Climate Change and Carbon Mitigation in Australian Tourism

Climate change and carbon mitigation is a growing issue in Australian tourism (Dwyer, Forsyth, Spurr & Hoque 2010; Hoque, Forsyth, Dwyer, Spurr, Ho & Pambudi 2010; Zeppel & Beaumont 2011a). Australian tourism strategies and reports include advice on greenhouse gas mitigation for tour operators (DRET 2009; QTIC 2008). Research on carbon mitigation in Australian tourism includes: emissions at North Queensland hotels (Curtis 2002); renewable energy at eco-certified accommodation (Nelson 2010); tourist operator attitudes to using renewable energy (Dalton, Lockington & Baldock 2007); and greenhouse gas emissions from marine tours (Byrnes & Warnken 2006; Zeppel 2011). While prior research examines one tourism sector (i.e. hotels, marine tours) or one type of carbon reduction (i.e. renewable energy), this paper evaluates carbon mitigation actions by a range of Queensland tourism enterprises.

### Tourism Queensland and Carbon Mitigation Programs

Tourism Queensland (TQ) has developed an emissions calculator and implemented a range of programs that support operators in reducing their carbon emissions and costs. These carbon tools include fact sheets on climate change and carbon offsetting, and website resources on

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sustainability and climate change (TQ, 2010a). The Queensland *Tourism Action Plan to 2012* focuses on *sustainable tourism initiatives to assist industry deal with climate change* (TQ, n.d). The Sustainable Regions Program was implemented by TQ during 2009 to improve the environmental performance and emissions reductions of tourism operators (TQ 2010b). This program was developed in partnership with EC3 Global, ecoBiz, Ecotourism Australia, regional tourism organisations and local councils. Sustainability initiatives based on ecoBiz involved over 70 tourism operators in five coastal regions and one outback locality. A report on four regions in the Sustainable Regions Program (Airlie Beach, Mackay, Stradbroke Island and Winton) found 49 tourism operators planned to reduce their carbon footprint, 28 operators completed a baseline assessment, 19 businesses completed a carbon footprint, 14 planned to invest in green technology and three businesses planned to offset their emissions (EC3 Global 2009). A related climate change initiative in 2009 was *The Biggest Carbon Loser* funded by a Queensland Government Low Carbon Diet grant that involved 38 participants (mainly tourism enterprises) in the Scenic Rim region of Southeast Queensland.

## METHODOLOGY

A carbon mitigation survey was developed based on a website review of climate change, carbon abatement, green business and sustainability practices promoted by Tourism Queensland, and other government tourism agencies in Australia (Zeppel & Beaumont 2011b). The websites of ecotourism certified operators were also reviewed for their carbon mitigation actions, along with the green business practices recommended in eco-certification programs, and the eco-efficiency (i.e. energy, water, waste) measures listed in Tourism Queensland's environmental indicators benchmark survey in 2010 (TQ 2010c). These provided the basis for the types of carbon mitigation actions listed in the tourism survey, along with other questions about operator motives for emissions reduction actions. The survey included 24 questions about the tourism business, climate change, and carbon actions.

The carbon mitigation survey of Queensland tourism operators (n=83) was conducted during January to October 2011. The target group for this survey was tourism operators with environmental credentials such as Eco Certification or Climate Action Certification (Ecotourism Australia); Eco Friendly Star accommodation (AAA Tourism); Earthcheck, Green Globe, or ecoBiz accreditation; or members of Savannah Guides and Planet Safe in North Queensland. These certification programs promote environmental best practice and eco-efficiency actions. Emissions auditing is required by ecoBiz, Earthcheck, and for Climate Action Certification. The environmentally certified tourism operators were located on website databases listing certified members. The carbon mitigation survey was forwarded to 380 tourism operators by email or post, along with some phone interviews or face-to-face interviews. There was a response rate of 25% with 83 completed surveys. The respondents to this carbon survey were Eco certified (n=58), Eco Friendly Star rated (n=14) or had Earthcheck/ecoBiz accreditation (n=11). The next section presents results from the survey of these Queensland tourism enterprises.

## RESULTS

Respondents to the carbon mitigation survey were: Accommodation (n=40), Tour Operators (n=31), Attractions (n=8), Convention Centres (n=3), and a Tourism Organisation (n=1). Nature tourism businesses were located in the rainforest, reef and savannah destinations of Northern and Central Queensland (n=43), or in national park, rural, and coastal areas of Southern Queensland (n=38). There were 17 marine tourism enterprises including diving, reef tours, sailing, kayaking, whale watching, and one aquarium. Other accommodation and

convention centres were located in the urban areas of Cairns, the Gold Coast and Brisbane. The size of the tourism enterprises ranged from Small Business (1-4 staff) (n=33), Medium Business (5-20 staff) (n=24), and Large Business (over 21 staff) (n=26). The tourism role of respondents completing the survey were the business owner/operator (n=44), or manager (n=25), business/operational staff (n=9), and environmental staff (4).

### **Climate Change and Queensland Tourism Enterprises**

The majority of surveyed tourism enterprises (n=73, 88%) agreed that climate change was an important issue for the tourism industry. A few operators (n=8, 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; while the 'not sure' respondent commented on *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 change information. They also referred to customer perceptions of climate change, preference for environmentally friendly practices, or buying tourism products on price as more important business factors. Operators that agreed climate change was an important tourism issue and referred to impacts on the reef, weather, wildlife, and destinations; protecting the environment; customer and industry expectations of sustainable practices; the impact of rising energy costs; and businesses adopting eco-efficiency measures. A few respondents commented on the carbon footprint of travel and the impact of a carbon tax (from 1 July 2012) on business operating costs. One reef tour operator stated *Climate change will affect us all but correct reporting is important to prevent hysteria, its being over marketed and de-sensitising pax* (passengers). These responses highlight operator awareness of climate change impacts on the natural environment, and eco-efficiency actions due to higher fuel and energy costs.

Most tourism enterprises (n=72, 87%) either strongly agreed (n=44, 53%) or agreed (n=28, 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 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 eco-efficiency measure was the installation of CFL bulbs at their property solely motivated by cost savings. The types of carbon reduction or green business training undertaken by tourism enterprises included TQ workshops on climate change/Climate Futures/Sustainable Regions (n=39), ecoBiz/Climate Smart Business/Low Carbon Diet workshops (n=25), Qantas Sustainable Tourism seminar (n=8), Acclimatise your business workshop (n=5), and Greenhouse Challenge Plus (n=4). One large rainforest attraction provided environmental awareness training for their staff and contractors. Two smaller operators were interested but lacked access to green training: *regrettably not in local area & unable to travel.*

Some 34 tourism businesses (41%) had completed an audit of their carbon emissions/energy usage, either with an online emissions calculator (n=19) or they had employed a consultant to audit their emissions (n=15). One attraction had an energy company conduct an audit of their emissions. Another 28 tourism operators planned to do an emissions audit in the next 12 months, while 22 tourism enterprises 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.* Tourism businesses assessed their carbon emissions with free online calculators

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from ClimateSmart, GBRMPA, ecoBiz, NGRS, Greenfleet, and Greenhouse Challenge Plus, or had their carbon emissions audited with Earthcheck software by EC3 Global.

Queensland tourism operators have adopted a range of carbon mitigation practices (Table 1). These include lower cost energy efficiency measures such as light bulbs, appliances, and reducing standby power (n=78, 69, & 61), plus recycling and reducing solid waste (n=75). Half of the tourism enterprises were training staff (n=48) or informing visitors about reducing carbon emissions (n=44). Less than half of all surveyed operators have roofing insulation, use room fans or operate new fuel efficient transport (n=39, 38, & 32), choose green suppliers (n=38), or market their emissions reduction actions (n=35). About a quarter of tourism operators have installed solar power; use solar/heat pump hot water heaters; implement other energy initiatives like conserving water, minimising energy use, gas heating or renewable energy; or carbon offset. Only a few tourism enterprises are using biofuels or driving electric/hybrid-electric vehicles.

**TABLE 1: Emissions reduction initiatives by Queensland tourism enterprises**

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| Install energy saving CFL bulbs or LED lights (n=78)                 |
| Practise recycling & minimise amount of solid waste (n=75)           |
| Purchase energy efficient appliances (n=69)                          |
| Switch off appliances at the wall to reduce standby power (n=61)     |
| Train staff or volunteers on your emissions reduction actions (n=48) |
| Provide information to visitors on reducing their emissions (n=44)   |
| Roofing insulation (n=39)  |
| Choose suppliers taking actions to reduce their emissions (n=38)     |
| Use room fans instead of air conditioners (n=38)                     |
| Market the emissions reduction initiatives of your business (n=35)   |
| Operate new fuel efficient vehicles or vessels (n=32)                |
| Use solar or heat pump hot water waters (n=21)                       |
| Other energy initiatives (n=21)                                      |
| Carbon offsetting (n=21)   |
| Install solar photovoltaic power (n=20)                              |
| Use ethanol mix or biofuels in vehicles (n=14)                       |
| Drive electric cars or hybrid-electric vehicles (n=12)               |
| Purchase GreenPower electricity from renewable energy (n=10)         |

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A few larger tourism businesses (n=10) 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.* Some tourism enterprises found it difficult to measure their carbon footprint or lacked staff, time or resources to adopt carbon mitigation actions.

Other energy initiatives by tourism enterprises included: operate solely on renewable power-hydro and solar; solar pumps; instant gas hot water service; system that regulates ac (air conditioning) to optimum; and building design to allow maximum natural light (attractions); driving practices to reduce emissions; gas hot water heater and optimising two generators; and purchase all 4 stroke outboard motors (tour operators); low emission gas heating-hot water and cooking; government grant for two solar powered cabins; movement sensors; and local product (accommodation). Other water initiatives included: reduce water consumption; bore water; rainwater; and rainwater tanks for toilet (attractions); 200,000 litres 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).

The main reasons for implementing carbon reduction initiatives at Queensland tourism businesses were:

- 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), and
- Other reasons (n=27).

The 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. A few larger enterprises (n=4) mentioned a business reporting legal requirement, such as carbon emission thresholds in the National Greenhouse Energy Reporting System (NGERS). When responses were ranked by operators from 1-4, the first ranked reasons were being a climate friendly tourism enterprise and cost savings along with environmental ethics. The second ranked reason was attracting environmentally aware tourists, with third level responses being a mix of the first three key reasons. The reasons ranked fourth were related to certification requirements (e.g. ecotourism, climate action) and environmental regulations. The other reasons ranked fourth were: *Management and staff personal commitment to being efficient; management company edict; acting as a role model for other tourism operators/local residents; and reinstating heritage values by refurbishing original 1930s hydro.*

## CONCLUSIONS

### Organisational Behaviour for Low Carbon Tourism

This study of carbon mitigation by tourism enterprises highlights organisational behaviour and motives of both companies and individuals for reducing carbon emissions. The Queensland tourism operators have adopted a range of carbon mitigation measures, the most popular being energy-efficiency initiatives and waste reduction. The reasons for tourism SMEs adopting carbon actions related to business and marketing benefits, environmental best practice and social responsibility. Personal environmental ethics was a stronger motive for carbon action by smaller owner-operated enterprises such as boutique accommodation and nature tours. Management commitment to carbon action and cost savings was a stronger motivation for larger tourism enterprises. Other studies of greening companies have found similar motivations for ecological responsiveness, including competitiveness, legitimacy, and social responsibility (Bansal & Roth 2000). The motivations for green practices by the owner-managers of UK tourism and other SMEs included environmental concern, altruism, legislation, cost savings, and publicity (Revell, Stokes & Chen 2010; Vernon, Essex, Pinder & Curry 2003). As noted for the smaller owner-operators in this study, these studies found a key driver for carbon actions was the environmental concern held by owner-managers of SMEs. Further research thus needs to consider the key role of personal environmental ethics in driving carbon reduction actions by business owner-operators. The subjective and objective constraints affecting the level of behavioural engagement in climate change reduction and mitigation actions by SMEs also requires further investigation (Sutton & Tobin 2011). The impact of green practices on organisational behaviour and performance needs addressing, along with environmental, social, business and marketing benefits from greening tourism SMEs.

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**REFERENCES**

Bansal, P & Roth, K 2000, 'Why companies go green: A model of ecological responsiveness', *Academy of Management Journal*, 43(4), 717-736.

Byrnes, TA & 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.

Curtis, IA 2002, 'Environmentally sustainable tourism: A case for carbon trading at Northern Queensland hotels and resorts', *Australian Journal of Environmental Management*, 9, 27-36.

Dalton, GJ, Lockington, DA & Baldock, TE 2007, 'A survey of tourist operator attitudes to renewable energy supply in Queensland, Australia', *Renewable Energy*, 32, 567-586.

Department of Resources, Energy and Tourism (DRET) 2009, *The Climate Change Guide: Mitigation and Adaptation Measures for Australian Tourism Operators*. Canberra. Retrieved from [http://www.tourism.australia.com/en-au/industry/sustainable-tourism\\_5583.aspx](http://www.tourism.australia.com/en-au/industry/sustainable-tourism_5583.aspx)

Dwyer, L, Forsyth, P, Spurr, R & Hoque, S 2010, 'Estimating the carbon footprint of Australian tourism', *Journal of Sustainable Tourism*, 18(3), 355-376.

EC3 Global 2009, 'Sustainable Regions Executive Summary', Retrieved from <http://www.tq.com.au/>

Hoque, S, Forsyth, P, Dwyer, L, Spurr, R, Ho, TV & Pambudi, D 2010, *The carbon footprint of Queensland tourism*. Gold Coast: Sustainable Tourism CRC.

Nelson, V 2010, 'Promoting energy strategies on eco-certified accommodation websites', *Journal of Ecotourism*, 9(3), 187-200.

Queensland Tourism Industry Council (QTIC) 2008, *Climate Change: A Brief Guide for Tourism*, Brisbane: QTIC. 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.

Sustainable Tourism CRC (STCRC) 2009, *The impacts of climate change on Australian tourism destinations: Developing adaptation and response strategies*. Gold Coast: Sustainable Tourism CRC.

Sutton, SG & Tobin, RC 2011, 'Constraints on community engagement with Great Barrier Reef climate change reduction and mitigation', *Global Environmental Change*, 21(3), 894-905.

Tourism Queensland (TQ) (n.d.), *Tourism Action Plan to 2012: List of Actions*. Brisbane: TQ. Retrieved from <http://www.tq.com.au/>

Tourism Queensland (TQ) 2010a, 'Sustainability and climate change', Retrieved from [http://www.tq.com.au/resource-centre/sustainability-and-climate-change/sustainability-and-climate-change\\_home.cfm](http://www.tq.com.au/resource-centre/sustainability-and-climate-change/sustainability-and-climate-change_home.cfm)

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Tourism Queensland (TQ) 2010b, 'Sustainable regions', Retrieved from <http://www.tq.com.au/>

Tourism Queensland (TQ) 2010c), *Tourism Queensland Tourism Operators Environmental Indicators Benchmark 2010*. Colmar Brunton. Retrieved from <http://www.tq.com.au/>

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.

Zeppel, H 2011, 'Climate change workshops for Great Barrier Reef marine tourism operators', *Tourism in Marine Environments*, 7(2), 95-98.

Zeppel, H & Beaumont, N 2011a, *Climate change and Australian tourism: A research bibliography*. ACSBD Working Paper No. 1. Springfield, Qld: Australian Centre for Sustainable Business and Development, University of Southern Queensland. Retrieved from <http://www.usq.edu.au/acsbd/publications/workingpapers>

Zeppel, H & Beaumont, N 2011b, *Green tourism futures: Climate change responses by Australian government tourism agencies*. ACSBD Working Paper No. 2. Springfield, Qld: Australian Centre for Sustainable Business and Development, University of Southern Queensland. Retrieved from <http://www.usq.edu.au/acsbd/publications/workingpapers>