

Consumer Attitudes toward Carbon Offsetting

Joe Kelly
Director, Environmental Services
InterVISTAS Consulting Inc.
Vancouver, British Columbia, Canada

Peter W. Williams
Professor, Resource and Environmental Management
Simon Fraser University
Burnaby, British Columbia, Canada

Wolfgang Haider
Associate Professor, Resource and Environmental Management
Simon Fraser University
Burnaby, British Columbia, Canada

ABSTRACT

Carbon offsetting involves trading off carbon dioxide emissions for financial contributions to carbon-offsetting activities. Such initiatives include planting trees that take up carbon dioxide or investing in the use of alternative energy sources that do not create carbon dioxide emissions in the first place. This research uses a contingent valuation approach to estimate the willingness of travellers to participate in tourist funded carbon-offsetting programs designed to compensate for the greenhouse gas emissions generated by travel to and from destinations. A case study undertaken in Whistler, British Columbia is used to test the utility of the method. The findings suggest that some potential exists for carbon-offsetting programs. In particular, many visitors would be willing to donate money to an independent organization to fund activities that offset greenhouse gas emissions. However, the degree of support tends to be market specific. The research provides a unique assessment of tourists' willingness to participate in a proposed carbon-offsetting program.

INTRODUCTION

Visitor travel to and from tourism destinations is an overwhelming source of energy consumption and greenhouse gas emissions (Becken et al., 2003; Gossling, 2002). Such travel is a fundamental prerequisite of tourism, yet it is the component that in many cases challenges the concept of sustainability the most. A possible strategy for addressing this challenge involves carbon offsetting (Becken, 2004). In a tourism context, carbon offsetting involves trading off carbon dioxide emissions from travel for financial contributions to various carbon-offsetting activities. Often, these initiatives focus on creating and protecting natural "carbon sinks" that absorb carbon dioxide (Becken, 2004). One form of carbon sink involves sequestering carbon dioxide as biomass, usually forests. While the global effectiveness of forest-based carbon sinks in taking up carbon dioxide is unclear and controversial (Dorsey et al., 2004), several programs are emerging that encourage consumers to contribute financially to the development of forested areas in exchange for their energy emissions (Carswell et al., 2003; Future Forests, 2000).

Beyond their carbon absorbing benefits, these programs may help protect and enhance regional biodiversity, hydrological, soil and scenic landscape protection initiatives in tourism destination regions (Becken, 2004). Conversely, they may be detrimental to areas away from tourism destinations established as “carbon dumps” (Dorsey et al., 2004). In this context, this research examines tourists’ willingness to participate in a proposed carbon-offsetting program. A case study undertaken in Whistler, British Columbia is used to test the utility of the method.

RESEARCH METHODS

The research used a contingent valuation (CV) method to estimate the amount of money tourists would be willing to donate to offset greenhouse gas emissions. CV methods are typically used to measure the economic benefits of non-market goods such as environmental resources or public goods (Cummings et al., 1986; Mitchell & Carson, 1989). The approach has been used over the last three decades in a wide range of environmental valuation problems (Freeman, 1993). In tourism and recreational contexts, most previous research projects involving CV have focused on estimating the benefits that tourists derive from natural resources, scenic beauty and recreational amenities (e.g. Bostedt & Mattsson, 1995). While a few studies have used the approach to value tourism-related impacts (e.g. Lindberg & Johnson, 1997), no previous research has employed contingent valuation to analyze the energy-related impacts associated with visitor travel.

A web-based survey was used to collect data for the CV application. It was developed based on information gleaned from existing literature as well as input gained from destination planners and managers in Whistler. Survey respondents consisted of visitors who were personally recruited during their trip to Whistler in the late summer and early fall of 2004. Of the 1,825 surveys delivered to recruited visitors, an overall response rate of 48% was achieved.

Survey respondents were asked to indicate whether or not they would donate a specified amount of money to a hypothetical non-government organization, which undertakes carbon-offsetting activities that compensate for the greenhouse gas emissions generated by visitor travel to Whistler. The preamble to the question described the negative consequences of greenhouse gas emissions generated from travel and outlined potential ways of offsetting these emissions. Respondents were then informed of the cost to compensate for the greenhouse gas emissions generated by their travel to Whistler. At that point they were asked to indicate their willingness to donate money to compensate for these emissions. The donation amount shown to the respondents was systematically varied over a predetermined range for each of four predefined groups based on their place of residence. The upper level for each range was roughly determined by multiplying average round-trip distance to Whistler by an estimated carbon-offsetting rate (\$25/1000 km).

Logistic regression methods were used to estimate the expected amount that visitors are willing to donate to offset greenhouse gas emissions. The dependent variable was the probability that a visitor will donate to offset greenhouse gas emissions, while the independent variables included characteristics associated with each individual traveller, as well as the donation amount. Only those variables significant at a 90% confidence level were retained in the final model. They were: travel party size; education level; motivation factor scores from a principal component analysis on travel motivation

questions; and a dummy variable specifying whether or not the individual was an overnight or day visitor. Complete derivations of the equation for willingness to pay and the associated confidence intervals are presented by Whitehead (1990).

As with other contingent valuation studies, respondents who answered “no” to the initial carbon-offsetting question were asked to indicate their reasons for not donating and if they would contribute another amount. For these questions respondents were able to select one or more reasons for not donating: (1) programs to compensate for greenhouse gas emissions are not needed; (2) activities undertaken by the organization to offset greenhouse gas emissions may not be effective; (3) the organization may not use the donated funds efficiently; (4) the cost is too high; and/or (5) some other reason specified by the respondent. The purpose of this follow-up question was to identify respondents who gave a “no” response in order to protest against the payment vehicle, not because they were unwilling to pay to compensate for the greenhouse gas emissions associated with their trip. In other words, these respondents would be willing to pay for carbon offsetting if the payment mechanism was structured in a different way.

FINDINGS

The logistic regression results indicated that visitors were significantly less willing to donate as the specified amount of carbon offsetting charge increased. An increase in the donation amount had a larger effect on the willingness-to-donate of nearby visitors than it did on long-distance travellers. Other key findings emerging from the analysis were that visitors:

- were more inclined to donate as their trip party size increased;
- staying overnight were more inclined to donate than day trippers;
- were more likely to donate as their formal education level increased;
- motivated by environmental factors (e.g. visiting a place that takes good care of its environment) were more likely to donate;
- motivated to travel by luxury-based factors (e.g. staying in first class hotels) were less likely to donate; and
- motivated to travel by social and cultural factors (e.g. learning new things and increasing knowledge) were more likely to donate.

The logistic regression results were used to estimate the expected amount that visitors would be willing to donate to offset greenhouse gas emissions. This analysis revealed that visitors who resided in British Columbia were willing to donate an average of \$9 to compensate for the greenhouse gas emissions associated with their trip to Whistler (Table 1). Tourists who lived in Alberta, Washington State and Oregon were willing to donate an average of \$20, and those who inhabited other parts of Canada and the USA were willing to contribute an average of \$17. Surprisingly and on average, visitors from overseas destinations were unwilling to provide such donations. This statistical consequence may have occurred because the donation amounts tested were too large.

Table 1: Estimated willingness to donate

	Expected Donation Amount	Sample Size	95% Confidence Interval
Group 1: BC	\$8.62	350	\$8.17 - \$9.07
Group 2: AB, WA & OR	\$20.38	140	\$18.12 - \$22.65
Group 3: Other CAN & USA	\$16.92	178	\$10.11 - \$23.73
Group 4: Other international	-\$7.43	112	-\$25.73 - \$10.87
Total	\$10.32	780	\$7.19 - \$13.46

Despite the unwillingness to participate in such a program amongst some overseas visitors, overall results indicated that most summer visitors were willing to donate money to at least partially offset the greenhouse gas emissions associated with their trip. However, the level of willingness to pay was constrained. Overall, 55% of the respondents were not willing to donate the amount of money specified in the survey. Approximately 39% of these individuals stated that the cost was too high (Table 2). In addition, 36% indicated that the organization might not use the donated funds efficiently, and 23% suggested that the activities undertaken by the organization to offset greenhouse gas emissions might not be effective. This highlights the importance of having a credible carbon-offsetting organization administering such an initiative if it is to be successful. Only a small share (6%) of respondents who were not willing to donate indicated that programs to compensate for greenhouse gas emissions were not needed. These individuals would not likely donate any amount of money no matter how effectively the organization operated. Finally, 41% of the respondents who answered “no” to the initial question stated they had some other reason for not donating. The most common “other” reason given by respondents was that the payment vehicle should be a mandatory tax or fee, not a voluntary donation. While these respondents were not willing to participate in a donation-based system, they may be inclined to support a more equitable carbon-offsetting tax. The remaining “other” reasons given by respondents are listed in Table 2.

Table 2: Reasons for not donating

	%*
The cost is too high	38.8%
The organization may not use the donated funds efficiently	36.0%
Activities undertaken by the organization to offset greenhouse gas emissions may not be effective	23.1%
Programs to compensate for greenhouse gas emissions are not needed	5.6%
Other**:	40.7%
• The payment vehicle should be a mandatory tax or fee, not a voluntary donation (32 responses)	
• Existing government funds should be used for this purpose (17 responses)	
• Already donate enough to other organizations and charities (11 responses)	
• Not enough information is provided about the proposed organization and its activities (9 responses)	
• Industry should be responsible for paying, not the individual consumer (8 responses)	
• Greenhouse gas emissions associated with trip are insignificant in the big picture (7 responses)	
• Already pay enough taxes and fees (7 responses)	
• Do not live in the local area so this is not my responsibility (6 responses)	
• Not in personal interest (5 responses)	
• Already do enough personally to offset greenhouse gas emissions (5 responses)	

* The sum of column percentages is greater than 100% because respondents could select more than one category.

** Only the most commonly cited “other” reasons are listed (>5 responses).

DISCUSSION

This research used a contingent valuation framework and associated method to estimate the willingness of travellers to participate in tourist funded carbon-offsetting programs designed to compensate for the greenhouse gas emissions generated by travel to and from destinations. Such programs offer destinations a way to address the vast energy impacts associated with visitor travel to and from destinations.

The findings suggest that some potential exists for carbon-offsetting programs. In particular, many visitors would be willing to donate money to an independent organization to fund activities that offset greenhouse gas emissions. Visitors who resided in neighbouring regions were more willing to donate than those who lived furthest from the destination. More distant visitors may be less willing to pay because of: higher costs associated with offsetting the greater levels of carbon dioxide they generate by their travelling; less attachment to the destination where the carbon-offsetting fees would be paid; and not recognizing the full extent of transportation emissions generated during their journeys. Ironically, long-distance travellers were more willing than nearby visitors to accept an increase in the suggested donation amount. Overall, the findings demonstrate that visitors may be willing to participate in appropriately priced carbon-offsetting programs. Visitors might be more willing to donate their funds if they are provided with information that alleviates their concerns about the ability of the organization to administer the program effectively. While the research was conducted in a specific case study context, other investigations of this type may help to confirm the positive market response this investigation generated.

REFERENCES

- Becken, S., D. Simmons, and C. Frampton (2003). "Energy use associated with different travel choices." *Tourism Management*, 24: 267-277.
- Becken, S. (2004). "How tourists and tourism experts perceive climate change and carbon-offsetting schemes." *Journal of Sustainable Tourism*, 12 (4): 332-345.
- Bostedt, G. and L. Mattsson (1995). "The value of forests for tourism in Sweden." *Annals of Tourism Research*, 22: 671-680.
- Carswell, F., B. Frame, V. Martin, and J. Turney (2003). "Exchanging emissions for biodiversity – in pursuit of an integrated solution in New Zealand." *Ecological Management and Restoration*, 4: 85-93.
- Cummings, R.G., D.S. Brookshire, and W.D. Schulze (1986). *Valuing Environmental Goods: An Assessment of the Contingent Valuation Method*. Totowa, New Jersey: Rowman & Allanheld.
- Dorsey, M.K., S. Ghosh, L. Lohmann, D. Wysham, T. Gilbertsen, H. Bachram, and A. Petermann (2004). "We must reduce fossil fuel use, not trade carbon." *Financial Times*, October 21: 14.
- Freeman, A.M. (1993). *The Measurement of Environmental and Resource Values*. Washington, DC: Resources for the Future.
- Future Forests (2000). "Going carbon neutral – a new campaign to help tourists combat climate change." Press release, June 20. Online at URL <http://www.futureforests.com>.
- Gossling, S. (2002). "Global environmental consequences of tourism." *Global Environmental Change*, 12: 283-302.
- Lindberg, K. and R.L. Johnson (1997). "The economic values of tourism's social impacts." *Annals of Tourism Research*, 24 (1): 90-116.
- Mitchell, R.C. and R.T. Carson (1989). *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Washington, DC: Resources for the Future.
- Whitehead, J.C. (1990). "Measuring willingness-to-pay for wetlands preservation with the contingent valuation method." *Wetlands*, 10 (2): 187-201.