Environmental Reporting of Airlines in the Asia Pacific Region

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This study investigates environmental reporting in the Asia Pacific airline sector. The findings indicate that only five airlines (all in four developed countries in the region) have published standalone environmental reports. The environmental reports of those five airlines were examined, using the assessment model developed by Adams (1998). Fifteen elements from Adams' framework plus one additional element were employed to analyse the content of the reports. At least 69% of the 16 elements were mentioned in the reports. Comparisons of environmental policy statements and environmental management systems used by the airlines were also made.

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Introduction

Airlines, an important element in many tourism activities, can bring economic benefits to departure and destination locations, but can also make environmental impacts on those areas and the global environment. With increasing tourism activity in the Asia Pacific region, environmental problems will become serious in the region, with significant repercussions, direct and indirect, on both tourism and the environment. These environmental impacts include noise pollution, noxious emissions, increased solid waste and waste water, as well as the release of greenhouse gases (Copeland, 1992; Lee & Raper, 2003; Wheatcroft, 1991). The impacts from air traffic mainly derive from three sources – fuel combustion, aircraft ground maintenance, and the consumption of in-flight meals. According to Blum (2001), air traffic accounts for 3.5% of the greenhouse effect caused by human activity. The scientific, aviation and environmental communities agree that air transport will continue to grow globally well into the 21st century and could result in further increased environmental effects (Air Transport Action Group & United Nations Environmental Programme, 2002). Blum foresees that by 2010, both air traffic and emissions are expected to double in comparison with 1990. Rapid development in the Asia Pacific region, especially in Mainland China, will dramatically increase air traffic and the strong purchasing power of residents will further expedite tourism activities. The World Tourism Organisation (2000) predicts more than 802 million inbound and outbound tourist arrivals to and from East Asia and the Pacific in 2020, representing an annual growth rate from 1995 to 2020 of 6.5%, over 2 percentage points above the global average of 4.1%. Thus, there is an imminent need for the airlines to be more aware of, and more effective at, developing and evaluating environmental

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conservation practices. Many international airlines have committed resources to environmental measures over the past decade. However, environmental reporting by the airlines in the Asia Pacific region is not standardised and comprehensive and there is a lack of recognised frameworks to follow. A good environmental report can demonstrate awareness, reassure stakeholders, provide other airlines with a benchmark for environmental improvement, and improve the company's image, thus gaining competitive advantages in the market.

Chapter 30 of Agenda 21, adopted at the Rio Earth Summit 1992, encourages business and industry 'to report annually on their environmental records as well as on their use of energy and natural resources' (United Nations Environmental Program Industry & Environment Office, 1994). The UK professional accounting association launched an environmental reporting initiative to identify and reward innovative attempts to communicate green performance (Gray *et al*., 1993). In 1998, the International Federation of Accountants echoed this green campaign and released an International Auditing Practice Statement on environmental matters (International Federation of Accountants, 1998); the Federation reported that it was well received by their members. The United Nations has backed similar procedures (Adams, 1998); 'green accounting' has already gained both professional and international recognition.

In 2002, the Air Transport Action Group prepared a report on aviation for the United Nations Environmental Programme as one of 22 industry studies on progress in sustainability in the decade since Rio. It was presented at the World Summit on Sustainable Development in Johannesburg and underlined air transport's full commitment to sustainability. Many airlines in developed nations have begun regularly publishing reports on their progress in environmental improvements. However, there are few publications about environmental reporting or accounting in the international tourism research literature apart from in the hotel sector (Chan & Lam, 2001a,2001b).

In response to the global trend towards environmental conservation, some airlines in the Asia Pacific region have begun to develop environmental policies and implemented environmental management systems. Some large airlines in developed countries in the region, such as Japan, Korea, Singapore and Hong Kong, have already participated in environmental reporting. This study aims to investigate the state of environmental reporting in the Asia Pacific airline sector and the elements included.

Objectives

The main objectives of this study were to:

(1) Map the status of environmental reporting in the Asia Pacific airline sector.
(2) Differentiate the environmental reporting content of the airlines.
(3) Suggest future directions in environmental reporting for the airlines in the region.

Methodology

Data for this research was collected from secondary sources including published airline environmental reports and environmental information regis-

Table 1 Content of environmental reports of the five studied airlines

Disclosure		*Studied airlines*						
		CPA	*SIA*	*ANA*	*JAL*	*KAL*		*Proportion*
CEO Section								
1	Corporate commitment	1	1	1	1	1	5	100%
2	Significant improvement since last report	1	1	0	1	1	4	80%
Environmental Review Section								
3	Scope of review	1	1	1	1	1	5	100%
4	Environmental policy statement	1	1	1	1	1	5	100%
5	Extent of local or worldwide compliance	1	1	1	1	1	5	100%
6	Key environmental issues facing the company	0	1	1	1	1	4	80%
7	Organisational responsibilities	1	1	1	1	1	5	100%
8	Description of environmental systems used	1	1	1	1	1	5	100%
9	Environmental performance data	1	1	1	1	1	5	100%
10	Sector specific data	0	1	1	1	0	3	60%
11	Environmental cost on remediation	0	0	1	1	1	3	60%
12	Any environmental index used for the industry	0	0	0	0	0	0	0%
13	Financial estimate of savings and benefits	1	1	0	1	0	3	60%
14	Cross-reference of the environmental reports	0	1	0	0	0	1	20%
15	Independent verification statement	1	1	1	0	0	3	60%
16	Plans and targets	1	1	1	1	1	5	100%
Total Score		11	14	12	13	11		
Proportion		69%	88%	75%	81%	69%		

Notes:
1. CPA: Cathay Pacific Airways
   SIA: Singapore Airlines
   ANA: All Nippon Airways
   JAL: Japan Airlines
   KAL: Korean Air
2. Score 0: data does not exist; 1: data available

tered on airlines' official websites. During 2002–2003, 23 international airlines in 14 territories in the Asia Pacific region were investigated, including Mainland China, Hong Kong, Macau, Taiwan, Japan, Korea, Singapore, Malaysia, Thailand, Philippines, Indonesia, India, Australia and Vietnam. To position the status of environmental reporting in the surveyed airlines, a formality–continuity analysis grid was developed. Formality refers to the types of reporting presentation including standalone reports, a section in annual report, web pages and bulletins. The standalone report represents the most formal; a bulletin represents the least formal. The continuity scale varies from annual reports through occasional reports in decreasing frequency.

In analysing the airlines' environmental reports, Adams' analytical framework has been adopted (Adams, 1998). His assessment framework contains 15 elements as shown in Table 1. The first two elements relate to a company's commitment towards environmental improvement. Elements three to eight show the company's environmental improvement systems. The remaining seven elements deal with specific aspects of improvement. In addition to these 15 elements, an extra element, 'plans and targets', shows the commitment of the airline to improving their environmental performance on a continuous basis, and allows evaluation of its targets and progress. The study categorised the elements into four groups: core components, important components, add-on components and developing components.

Results and Discussion

Figure 1 shows the current status of environmental reporting in Asia Pacific airline sector. Only four airlines (All Nippon Airways [ANA], Japan Airlines [JAL], Singapore Airlines [SIA] and Korean Air [KAL]) from Japan, Singapore and Korea have published standalone environmental reports on a continuous basis. Their formal reports, which describe in detail the progress of environmental management in operations, show the airlines' full commitment to sustainability. Japan's airlines have published standalone environmental reports for more than a decade while SIA and KAL have also produced quality environmental reports in recent years. Singapore Airlines was presented with the 'Best Environmental Report Award' in the year 2003 by the Singapore government. Korean Air actively participated in a national environmental project promoted by the Korean Ministry of Environment; it also took part in the 'Environmental Guideline Establishment Project' that included environmental performance evaluation and environmental account information, and joined the national '2001 environmental annual report publication project'. Korean Air's effort in the early 2000s has contributed greatly in setting guidelines for the establishment of national environmental policies generally (Korean Air, 2003).

From Hong Kong, Cathay Pacific Airways (CPA) published standalone environmental reports twice in five years. The lack of a more regular publication probably reflects cost cutting following the tourism slump after the Asian financial crisis, bird flu and SARS. Cathay Pacific Airways has also shared its environmental technical knowledge and experience with its associated companies, contractors and suppliers by implementing a number of environmental engineering projects.

Other airlines characterised by informal content and occasional publication

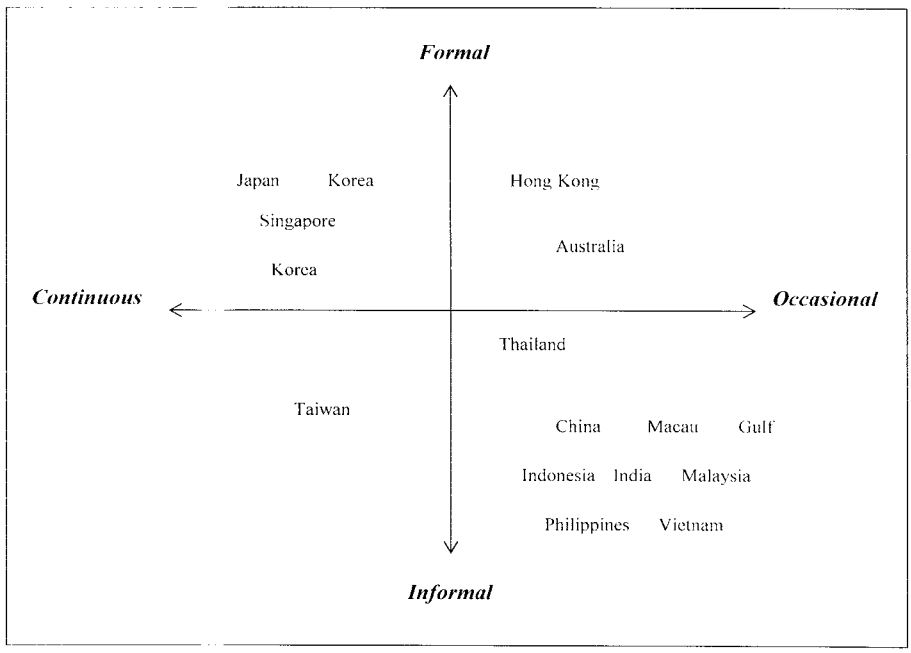

Figure 1 Status of environmental reporting

of environmental information are China Airlines (based in Taiwan), Qantas and Thai Airways. China Airlines have briefly mentioned their contributions to environmental protection in their annual reports and homepages. Qantas Airways' environmental information looks similar to the disclosed content of China Airlines. Thai Airways have put a brief note about its achievement on its web pages.

Airlines with bases in Mainland China, Macau, India, Indonesia, Malaysia, Philippines, and Vietnam had neither environmental policy statements nor any form of environmental reporting.

Overall, less than one quarter of airlines in the region have ever published environmental reports. The operating bases of the airlines that do regularly publish are located in Japan, Singapore, Korea and Hong Kong. It was found that the environmental reports published by the five airlines in those countries included some features mentioned in Adams' analytical framework (1998). The environmental report of Singapore Airlines included most of the Adams' features (nearly 90%); the other four airlines included from 69% to 81% of Adams' suggestions.

Core components

It can be seen from Table 1 that all five airlines have addressed the eight essential core elements in their reports, including corporate commitment, scope of review, environmental policy statement, extent of local or worldwide compliance, organisational responsibilities, description of environmental systems used, and environmental performance data, as well as plans and targets.

Environmental policy statement

Among these eight core elements, corporate commitment to continuous environmental improvement was clearly indicated. It showed that all staff in the company, as a team, had to be committed to finding ways to protect the environment. In order to practise corporate commitment, training and development was needed and these were essential elements in ensuring the success of environmental practices and initiatives. These five Asian airlines' emphasis on corporate commitment was the same as in eight other airlines in Europe studied earlier (Air France, 2002; Alitalia, 2002; British Airways, 2002; Finnair, 2002; Iberian, 2002; KLM, 2002; Lufthansa, 2002; SAS, 2002).

According to Table 2, although the five airlines have different interpretations of their own environmental policy statements, all regard employee involvement, conservation of natural resources, legislation compliance and discharges to air, land and water as essential elements. Among these airlines, Japan Airlines almost covers all indicated elements and issues, except health and safety. Singapore Airlines, on the other hand, emphasises health and safety. ANA and Cathay Pacific Airways are especially devoted to sustainable development and local community issues respectively.

Table 2 Content of environmental policy statement

	Studied Airlines						
	CPA	***SIA***	***ANA***	***JAL***	***KAL***	***Score***	***Proportion***
Employee involvement	1	1	1	1	1	5	100%
Conservation of natural resources	1	1	1	1	1	5	100%
Legislative compliance	1	1	1	1	1	5	100%
Discharges to air, land and water	1	1	1	1	1	5	100%
Health and safety		1				1	20%
Sustainable development	1			1		2	40%
Local community issues			1	1		2	40%

Note: 1 means relevant words or phrases available in the statement

Worldwide or local compliance

In terms of worldwide compliance, all the aircraft of five airlines studied have been certified to the ICAO's (International Civil Aviation Organisation) Chapter 3 Noise Standards, and almost all aircraft have met the Chapter 4 aircraft's noise reduction requirements. All Nippon Airways (ANA) also reported their achievements on emission control of their aircraft engines compared with the ICAO standard. The control includes CO_2, smoke and hydrocarbon emissions. Singapore Airlines developed an integrated OSHE (occupational safety, health and environmental) management system and guidelines for the SIA Group, and its branch company, SIA Engineering Company successfully achieved certification to OHSAS 18001 for establishing a Safety Management System within the company.

Environmental Management System

The five airlines have already introduced and applied Environmental Management Systems (EMS). Steger (2000) defined an EMS as a 'transparent, systematic process, with the purpose of prescribing and implementing environmental goals, policies and responsibilities, as well as regular auditing of its elements'. The five airlines have also been accredited to ISO 14001. Published in 1996, the ISO 14001 standard is one of several available frameworks within which to develop a facility's EMS. This is a worldwide voluntary standard developed by the International Organisation for Standardisation (www.iso.org); the key reference document is 'BS 7750: Specification for Environmental Management Systems'. Along with ISO 14001 there are a number of other guidance documents concerning good practices in EMS, eco-labels, life cycle analysis, environmental auditing, and environmental performance evaluation (Chan & Wong, in press). An ISO 14001 certified EMS can be characterised in terms of policy, goals, objectives, organisational structure, assigned responsibilities, procedures and operations, management review, and various methodologies: the purpose of an EMS is to bring an organisation into alignment with its environmental policy and to demonstrate this to others (ISO, 1996). Among the five airlines, Singapore Airlines has been awarded the most ISO 14001 certification. To date, seven units (plus three associate companies) within the SIA Group of companies have achieved this certification, despite the substantial and long term investment that ISO 14001 accreditation requires.

Environmental performance data

Environmental performance data is a frequently reported item in a standalone report. One typically disclosed element is fuel efficiency, usually expressed as the ratio between the fuel consumption and the flying distance per passenger. ANA's report also shows an overall fuel efficiency with a breakdown into domestic and international flight components. JAL classifies fuel efficiency according to different models of aircraft. ANA distinguished itself by listing over 36 measures for saving fuel with corresponding comments to assist readers in understanding the fuel saving measures. It is important to note, however, that the definitions of fuel efficiency used by the airlines are quite different making comparisons difficult (see Table 3).

Table 3 Definitions of fuel efficiency

Airline	***Fuel Efficiency***
JAL & ANA	$\frac{\text{Fuel (kg)}}{\text{Available seat kilometre}}$
SIA	$\frac{\text{Fuel consumption (million American gallon)}}{\text{Load carried (tons) * distance flown (km)}}$
KAL	$\frac{\text{Fuel (kg)}}{\text{100 (in ton kilometre)}}$
CPA *	$\frac{\text{Fuel (gm)}}{\text{Revenue per kilometre}}$

* Passenger flight only

Important components

Eighty percent of the environmental reports had information about significant improvements since the last report and about key environmental issues facing the company. These two elements are important components that further support the core components.

Add-on components

Apart from core and important components, there are some additional elements in the reports: 60% of the reports indicated sector-specific data, costs of remediation, financial estimates of savings and benefits as well as independent verification statements. These four elements can be regarded as complementary elements that can enrich the content of the environmental reports. Environmental costing is a very useful tool for facilitating the implementation of environmental management systems, since it converts the environmental impacts into monetary terms (i.e. environmental cost), thus easing the planning, target setting, measurement and evaluation of environmental conservation programmes. The high cost of establishing databases for this work may explain why only half of the airlines studied had worked in this area. Collaboration with universities and environmental institutes in establishing these databases may reduce the resource requirement.

Only three airlines (SIA, ANA and JAL) incorporated sector-specific data in their reports, essential to allow airlines in the region to compare each other's environmental protection programmes. Sector-specific data is information of special significance to the airline industry, such as aircraft engine noise levels or sound footprints around airports. It is hoped that the government and environmental protection bodies can put more effort and support into setting a common target on the reporting of sector-specific data.

Developing components

Two components, which have seldom been seen in the environmental reports, are cross-referencing and environmental indices for the industry. The latter have long and widely been applied in various sectors (Inhaber, 1976; Rogers *et al*., 1997; Sofuoglu & Moshandreas, 2003). The environmental impact or the remediation cost associated with each pollutant variable in the index allows comparison over the measured years. The index can further indirectly communicate the social and environmental effort of airlines' actions to society at large. At present, cross-referencing and environmental indices are not essential elements in environmental reporting but their inclusion certainly can improve the quality of the reports.

Cross-referencing refers to the indication of source or origin of the information such as emission data, air traffic flow issues and views mentioned in the report. This allows the reader to find out more easily detailed information about items cited in the text. The findings indicate that only one report has used the cross-referencing in the environmental reports. The lack of cross-references can be remedied by establishing linkages to web page references.

None of the Asia Pacific airlines included environmental indices in their reports, probably due to the expense involved. Asia Pacific airlines could refer to the outstanding environmental reports published by the European airlines in

which environmental indices have been established and included (SAS, 2002). Additionally, governments and environmental protection bodies in the region could cooperate to construct these indices.

New features

As well as the 16 examined components, some additional features are included in some of the airlines' reports. These include:

(1) Provision for reader feedback, to gather reader views about the reports and their value. ANA and JAL even quote examples of reader feedback in their reports.
(2) Research and development sections indicate the range of new ideas being tried by airlines to cut environmental impacts. It was observed that few airlines have conducted research projects in cooperation with other authorities.
(3) Korean Air has included a special feature on 'Countermeasures against environmental accidents' in its report. This describes a plan for the environmental procedures necessary after aircraft accidents, and environmental management regulations for handling different types of emergencies.

Conclusions

The study investigated the environmental reporting practices of 23 airlines in 14 Asia Pacific territories. The findings indicate that eight airlines in the region have implemented any form of published environmental reporting, and only five of them in four countries have published standalone environmental reports. It appears that airlines in the more developed countries are more environmentally conscious and have invested heavily in environmental policies. In order to reduce the cost of developing pro-environment policies in the less developed countries, inter-company cooperation, and cooperation with government bodies and professional institutes could be recommended. There is also an urgent need to develop an industry-wide model for airline environmental policies, and environmental reporting to allow inter airline comparisons to be made by the airlines themselves, by governments, by the press and media, and by travellers. This would be valuable both for the environment and for the future of the regions tourism industry.

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Appendix

List of studied airlines in Asia Pacific region

		Studied Airlines	*Initials*	*Websites*
1	Australia	Qantas Airways	QFA	www.qantas.com.au
2	China	Air China	CCA	www.airchina.com.cn
3		China Eastern Airlines	CES	www.ce-air.com
4		China Southern Airlines	CSN	www.cs-air.com
5		China Northern Airlines	CBF	www.cna.com.cn
6		Hainan Airlines	CHH	www.hnair.com
7		Xinhua Airlines	CXH	www.chinaxinhuaair.com
8	Gulf	Gulf Air	GFA	www.gulfairco.com
9	Hong Kong	Cathay Pacific Airways	CPA	www.cathaypacific.com
10		Dragonair	HDA	www.dragonair.com
11	India	Indian Airlines	IAC	www.indian-airlines.nic.in
12	Indonesia	Bouraq Indonesia Airlines	BOU	www.bouraq.com
13	Japan	All Nippon Airways	ANA	www.ana.co.jp
14		Japan Airlines	JAL	www.jal.co.jp
15	Korea	Korean Air	KAL	www.koreanair.com
16	Macau	Air Macau	AMU	www.airmacau.com.mo
17	Malaysia	Malaysia Airlines		www.malaysiaairlines.com.my
18	Philippines	Philippine Airlines	PAL	www.philippineairlines.com
19	Singapore	Singapore Airlines	SIA	www.singaporeair.com
20	Taiwan	China Airlines	CAL	www.china-airlines.com
21		Eva Air	EVA	www.evaair.com.tw
22	Thailand	Thai Airways International	THA	www.thaiair.com
23	Vietnam	Vietnam Airlines	HVN	www.vietnamairlines.com.vn

The Environmental Report Web Addresses of the five Asia-Pacific Airlines with standalone reports

www.singaporeair.com/saa/en_UK/content/company_info/responsibility/environment.jsp
www.koreanair.com/local/na/eng/gd/ak/ev/Introduction.htm
http://www.jal.com/en/environment/
http://www.anaskyweb.com/us/e/about_ana/corp_info/safety_env/index.html
http://www.cathaypacific.com/intl/aboutcx/community/0,,126061,00.html