MANAGING AIRPORT FUTURES USING ENVIRONMENTAL MANAGEMENT SYSTEMS

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Abstract

Environmental management systems (EMS) are specifically designed to instruct organisations in the management of environmental impacts, and are considered by many to be the most valuable tool for building a sustainable future. However, because EMS are hinged to best practice and existing leading technology, they tend to lock-in current thinking. This is problematic for businesses such as airports, which are increasingly looking towards future solutions to emerging and intransigent issues such as noise, CO2 emissions, congestion and safety. Ways need to be found for EMS to balance existing knowledge frameworks with creative and experimental ideas and constructs. As the central information source for EMS, indicators are key to the evolution of their design. This article explores ways of creating indicators that transcend the constraints of existing measuring, monitoring and reporting regimes to facilitate more sustainable airport futures. Accordingly, the article has three objectives. Firstly to demonstrate that EMS for airports have significant scope for improvement. The second objective is to show that rethinking what indicators are and do is fundamental to realising that improvement. And finally, the argument for sustainability-prioritising, contextually constructed indicators that build on current best practice by encouraging innovative institutional learning and reform is the best way of advancing more sustainable airports.

1. The Problem with EMS

Environmental Management Systems (EMS) can be a lot of things, but essentially it is an information-based performance-measuring framework that is outcome-focused and used to identify, manage and reduce impact on the environment and, or by means of, environmental performance reporting. In Australia, ISO 14001 (in the form of AS 14001 – specifications) and ISO 14004 (AS 14004 – general principles) were released in 1996 with the aim of enabling organisations to "formulate a policy and objectives taking into account legislative requirements and information about significant environmental impacts" (Standards Australia and Standards New Zealand 1995:3). The driving philosophy for these standards is pollution prevention, environmental regulation compliance, and improvement to best available technology. Five distinct stages of the EMS are specified by the standards. These include environmental policy, the planning stage, implementation and operation, checking and corrective action, and management review with a view to continual improvement.

In essence, an EMS provides a systematic and methodical approach to planning, implementing and reviewing an organisation's response to environmental impacts. Thomas (2005:189) cites Netherwood (1996) and Sayre (1996) in neatly describing the EMS as a "formalised set of procedures to enable an organisation to control its impacts on the environment". What it doesn't do is establish environmental standards, but sets out procedures designed to meet environmental performance requirements that are identified as most relevant to an organisation. It can also be integrated with other management systems (such as Occupational Health and Safety) to give a whole of business approach. And by implementing an EMS, an organisation can ensure that addressing environmental issues is at least ostensibly incorporated into everyday business operations.

Where they exist, airport Environmental Management Systems (EMS) almost exclusively focus on environmental impacts from airport ground operations. These traditionally have been airside (aviation-based)

operations, although as the roles of airports expand (Kasarda 2001), EMS are increasingly embracing landside (non-aviation) activities. This implies an evolving role for the airport EMS, however it is unclear whether the changing face of airports is reshaping the way they are structured and used, or indeed whether this is necessary or appropriate. What is clear is that EMS remains very much a 'self-regulation' tool that provides scope to far exceed any imposed regulation from above.

It is unquestioned that environmental regulation is here to stay, having facilitated untold improvements in the way modern societies function relative to physical limits. Along with all its many achievements, regulating for improved environmental outcomes has encountered no less than 4 decades of difficulties, not the least of which is the pivotal problem of adjudicating in whose interest environmental regulation actually serves (Pashigan 2007). So while regulation clearly has a role to play in achieving improved environmental performance, the nature of regulation ensures an emphasis on policing minimum compliance standards rather than striving for virtuous and ethical bar-raising. This 'minimisation approach' invariably occurs in a context of competing motivations that may be plotted along a continuum book-ended by self interest at one extreme and potentially unlimited public good outcomes at the other.

On this basis, it is argued here that 'self-regulation' can achieve much more in a competitive market place that increasingly values sustainability and its champions (Sigismund 2000). Indeed, rather than self-interest-driven minimum compliance, self-regulation expressed through EMS frameworks can actually encourage a 'race to the top', or a culture of "direction-setting" and "sustainability-seeking" (Thomas 2005:218). Indicators should therefore reflect this dual reality. This can be achieved on the one hand by stipulating minimum allowable performance as a quantitative or qualitative measure against current best practice benchmarks, and on the other by providing guidance that creates conditions enabling current best practice driven by leading edge technology yet limited by cultural and political constraints, to be exceeded.

Environmental protection is not only highly regulated, it has become 'institutionalised' through the agencies, policies and strategies established as a result of this regulation (Martin and Verbeek 2006:1). These institutions include EMS frameworks themselves. In other words, the task of dealing with environmental standards, at least at the larger organisational level, has been mostly internalised, professionalised, and systematised. Not only has this led to a 'packaging' of sustainability within the organisation, it has also served to disenfranchise small to medium enterprise who often can't afford to devote time and resources to the 'business' of environmental protection. Indeed, this was a major finding from a survey of 50 SME's attempting to address sustainability issues (Kimmet and Wikstrom 2006).

A two-fold strategy is needed to redress this situation. Firstly, environmental protection needs to be increasingly 'externalised' for the benefit of all. What's meant by this is for those organisations that employ an EMS to expand their objectives to embrace the co-ordinated creation and 'institutionalisation' of an aspirational culture of sustainability. This can happen within and across organisations using proven catalysts that may include cluster synergies, mentoring and conferencing. Second, SME and smaller organisations can be encouraged to form alliances and partnerships that enable the pooling of resources, the exchange of lesson learning, and the transfer of creative thinking, helping them connect to the 'externalisation' efforts of larger organisations. This second strategy is illustrated by Riddiford (1999) with respect to a joint EMS strategy undertaken by four wineries, and by Ammenberg et al. (1999) in the recording of a partnership of small enterprises in a Swedish industrial district. And both these strategies can be kept in check by an EMS or shared EMS that doesn't set hoops to jump through, but creates a platform for creative excellence.

The structure and expectations of EMS in airport contexts are outlined in the first section of this article. The second section takes a closer look at indicators as the fundamental component of EMS, and considers some questions about the way they are developed, how they are used, and what they can tell us. The final section explores ways of making indicators more powerful by designing them to measure institution building generally and the growth of a well informed and enabled 'sustainability culture' at airports and by airport operators in particular.

2. The Airport EMS

2.1 Measuring Airport Environmental Performance

The parameters for developing the metrics of sustainability appear to be sensibly informed by what is widely regarded as best practice or best available technology – understood in terms of less waste, lower resource use intensity, and reduced greenhouse gas emissions. However, this approach pays little attention to how sustainable each practice or entity actually is. This means that anything apparently 'greener' than normal practice can be passed off as 'sustainable'. A more thoughtful approach to sustainability measures life-cycle processes from the moment that sustainability of an entity becomes a major objective. By contrast, usual

practice is for performance to be measured following the adoption of an EMS, or at project completion. This assumes that in the scheme of things the development stage doesn't really matter, and has an insignificant on-going residual affect, and demonstrates an appalling understanding of the enormous role played by embodied energy and resources in terms of system throughput (Georgescu-Roegen 1971). As Daly explains, this is because economics are traditionally only concerned about scarcity, and the abundance of the Earth's resources means that they are not considered scarce (1989:76). The implication is profound for strategies aiming to replace aging, obsolete and inefficient structures with the new 'green' equivalents as an unquestioned sustainable thing to do. Advanced, state-of-the-art practice is invariably held to be more sustainable than what is regarded as obsolete techniques, tools and methods.

A thorough survey of airport environmental performance was carried out by Francis et al (2002) using interviews with airport managers and the data obtained from a questionnaire completed by 200 of the world's busiest passenger airports. The authors were particularly interested in examining how benchmarking has been used by airport operators to internally compare and improve performance (2002:239). They found that benchmarking activity is beginning to be applied across a wide range of airport functions. According to their survey, 72% of airports engage in benchmarking of some description, while 46% undertake 'Best Practice Benchmarking' (2002:246). They also found that this internal performance measuring effort is relatively new. Francis et al. (2002: 240) pointed out that "historically, comparative performance of airports amounted to the collection and comparison of financial and output measures by Governments, who at the time typically owned and operated the majority of airports". And according to Doganis (1978) measures of performance that developed in airports were often based on work load unit (WLU), defined by the processing of a single passenger or the conveyance of 100 kg of freight. This measure, used mainly by airlines, was adopted by airports in the 1980s to provide a uniform measure of output for passengers and freight. Thus, typical indicators that evolved measured WLU against total cost, operating cost, labour cost, number of employees, total revenue, and aeronautical revenue (CIPFA 1980; Doganis 1978, 1983, 1992; Doganis and Graham 1987; Graham 1999; BIE 1994).

WLU-based measures have been used by Graham (2001) to compare European airport financial performance on the grounds that these indicators are progressively more important to the expanding list of airport stakeholders within a context of increasing airport privatisation and commercialisation. Clearly, such measures are a useful starting point from which to scrutinise airport performance. However, to what extent airport performance improves when scored by WLU-based systems is yet to be determined.

While WLU has been a central concept in indicator development, less performance-oriented measures have also been used. These include guideline-based airport design and airport operational standards, and monitoring using a space-user ratio measure of service standards. And in some cases, airport user surveys have been undertaken to further ascertain satisfaction (Francis et al 2002:240; Ashford et al 1995; Caves and Gosling 1999). Francis et al (2002:240) also observed that "new measures for airports that reflect service quality to customers, the environment and an increased focus on commercial, and retail revenues have begun to emerge". However, echoing the point raised earlier about failing to take historical data data into account, Francis et al. point out that "there is little evidence of action to address measures recorded as a starting point from which to improve airport performance" (2002:241).

Researchers have also found that while airports have traditionally monitored their own economic performance, some managers are now starting to recognise the benefit of comparing benchmarked performance to other airports, with the view of improving competitive position (Francis et al 2002; Graham 1999, 2001; CAS, 1998). These efforts are assisted by member organisations, which are also beginning to record and compare airport performance. In the UK, annual airport performance results are published by the Chartered Institute of Public Finance and Accountancy (CIPFA). And a degree of financial scrutiny is provided by the Airports Council International (ACI), which produces an annual economics survey comparing regional performance of airports globally.

The rise in significance of benchmark comparisons for airports prompted the International Air Transport Association (IATA) to begin publishing the *Airport Monitor* in 1993. The *Monitor* has given passenger perception ratings of the quality of service delivered by airport facilities across approximately 60 different airports each year. This has enabled each participating airport to compare their performance with other sample airports for up to 25 service features based on an airline survey. Nevertheless, some airport managers find this survey data too limited, preferring to monitor operations against internally derived benchmarks and comparisons (Francis et al 2002:241). This helps to explain the popularity and regular updating of IATA's Airline Financial Performance Benchmarks publication, which is freely available from its website.

Also emerging is the benchmarking of retailing at airports. This is occurring at a time when many managers are becoming increasingly aware of retail's importance in the airport business. Global airport retail surveys undertaken in 1998 and 2001 are drawn from only 31 airports, but are nevertheless a useful starting point for developing benchmarks based on gross retail sales, retail yield and gross retail sales per square metre (Francis et al 2002; Cerovic 1998; CAS 2001; Favotto 2001).

As Francis et al (2002:241) argue though, "the next step [is] to see how the measures are used and to assess their usefulness to those who use them". And they also see as just as important, studies into the impact of airport operations on local and regional environments beyond the tracking of noise footprints over time, which may be carried out by individual airports, government or communities. IATA was first to address these wider environmental concerns (Francis et al 2002:241) with their *Airline Environmental Reporting 2001 Survey*. This report detailed the many different approaches to airline environmental reporting, while providing guidelines and evidence of good practice for those in the airline-related business wishing to embrace the practice, or do it better (IATA 2001). And IATA also produces the *Environmental Review*, which updates developments in aviation environmental issues. A key focus of the publication is to discuss technological, operational and market-based measures aimed at addressing aircraft noise and emissions, and it also describes regulatory and policy developments.

Differences in the way airports have been corporatised have contributed to the confusion over the regulative situation. For instance, when the regulatory process was developed for the Manchester and London airports, there was no formal service monitoring requirements (Graham 2005). This is in contrast to the Australian airport privatisation process. Australian airports were required to internally monitor performance, with the UK airports forced to follow suit in 2003. The benchmarks that were then imposed on UK airports were derived from a mixture of service measures and passenger survey responses. It was also expected that aircraft and passenger delays would also be factored into the UK benchmarks in the future (Graham 2005).

Fry et al (2005:136) point out that improvements generated by performance benchmarking not only reinforces strategies for coping with growing traffic volumes both inside and outside terminal facilities, it is also useful for managing community relations. Clearly from this perspective, the availability of quantitative data and increasing consistency in the use of key performance indicators is only part of the picture. Measuring performance must also include qualitative feedback and rich information flows that alert managers to emerging problems and facilitate speedy solution finding. And the problem of effective information dissemination must also be considered.

However, as Hooper and Greenall (2005:151) argue, "comparing social and environmental performance across the airline sector is fraught with difficulties". They cite variations in the definitions of indicators and the suite of functions that they are applied to as fundamental obstacles to effective aviation sector benchmarking. And Upham and Mills (2005) make the observation that enriching stakeholder dialogue through the use of sustainability reporting is key to facilitating improved performance-based benchmarking and translating this into better outcomes. In particular, Upham and Mills (2005) argue that this will require closer scrutiny of environmental and sustainability reports, and the tailoring of the reports to the specific needs of various stakeholder groups.

What Upham and Mills (2005) actually mean by effective environmental sustainability reporting is effectively life cycle analysis (LCA) of the airport system measured in terms of impacts, and referenced to global, regional and local environmental thresholds. They recognise that regular LCA of such large systems such as airports are impractical, and therefore advocate substituting core indicators for "resource inputs to the airport, waste emissions at the site and waste outputs leaving the site, plus indication of impacts on local environmental quality" (2005:176). Such indicators, they concede, will need to take into account typical data availability and what can reasonably be expected of airports. They also argue that the integration of operational and environmental sustainability indicators supplemented by appropriate social and economic benchmarks would help to highlight linkages within the system. Finally, Upham and Mills (2005) view such efforts as working systematically towards a generic set of relevant global reporting initiative indicators.

2.2 The EMS Challenge

While corporations have led the uptake of EMS, a broad range of organisations and government agencies have embraced them. At a minimum, this entails the hire of external consultants to develop and manage the EMS, but more usually it implies the engaging of an environmental manager and support team. Indeed, a glance through the positions vacant classifieds suggests that this is where a bulk of the booming number of jobs in the environmental sector reside. The problem with EMS though is that a focus on 'measurables' alone often leaves much unsaid about the process of delivery, which is arguably central to the 'net', 'life-cycle' sustainability equation. So while performance rating indicators clearly facilitate change based on an

expanding vision of what is achievable physically, they are less effective in measuring some elusive intangibles that resist being concisely and neatly contained with definitive categories and criteria. Put simply, the gathering and processing of qualitative data that is usually used to describe intangible entities and activities is traditionally neglected, or at best, less well understood. And because intangibles tend to be less easily measured, statistical analysis is likewise underdone. The implication is that intangibles such as the nature and quality of stakeholder dialogue, which Upham and Mills (2005) see as a key driver towards improved transport-related performance-based benchmarking, are largely not being assessed. This ultimately means that intangibles tend to have much less influence on sustainability strategies than more tangible metrics.

It is the intangible components that generate much of the qualitative feedback and rich information flows that alert managers to emerging problems and facilitate speedy solution finding. By definition, intangibles are those elements which are knowledge-based, are often referred to as intellectual capital, and as such don't take a physical form (Zambon and Marzo 2006; Lev 2000). Nevertheless they may result in profound physical, economic and social outcomes. Management itself, for example, is not something that can be easily measured directly, but is quantified indirectly by the quality of its results or the performance of certain tasks. Making things more complicated is the fact that management performance may or may not influence sustainability outcomes depending on a vast array of competing, integrated, and at times complementary factors. The culture of an organisation is even more difficult to measure unless staff and stakeholders themselves are petitioned to express their views.

The truth is that culture is a heavyweight contender for the primary indicator of an organisation's future direction. A culture of innovation and environmental concern will inevitably produce a range of ideas and strategies that can redefine the organisation. This introduces the first part of the argument presented here, that there is an urgent need for research into the further development of techniques for measuring intangibles, and thereby improving the indicative, diagnostic and reporting power of the EMS. This appears to be a point that escapes many prominent advocates of EMS. For instance, in their widely acclaimed volume on sustainability – *The Natural Advantage of Nations* – Hargroves and Smith (2005:160), who emphasise the central role that EMS play in the sustainable transformation of business, have a good deal to say about generating efficiency, particularly in the rush to get innovations to market. However, efforts to prioritise and measure efficiency are almost entirely expressed in material terms, while discussions about process and other intangibles are conspicuously absent from much of their discussion.

An important question then is how to incorporate the measurement and reporting of intangibles in the EMS? To answer this we must generate a clear understanding of what intangibles are, and how they benefit business. Defining intangibles in a traditional way as site specific goodwill, or as a financial premium for personal/ corporate reputation, fails to grasp the dynamic of how it builds business. Intangibles are that something special that is as elusive as it is valuable to the profitability of a business – things such as social capital (staff skills), strategic and process quality, software, patents, brands, and networks – are all increasingly contributing to corporate competitiveness. Nakamura (2003), from the Federal Reserve Bank of Philadelphia for instance, estimates that investment in intangibles in the US alone exceeds a trillion USD, equivalent to about 9% of US GDP, and is nearing capital expenditure on tangibles.

So while climate change diplomacy may well be driving the 'international end' of the sustainability agenda, the EMS is arguably the principle mechanism at work at the 'business end'. These dynamics are helping to position sustainability as a growth industry, with governments and larger organisations in particular embracing more sustainable approaches, often as way of generating electoral appeal and building brand (Kimmet and Wikstrom 2006). This raises particular concerns about the role of the EMS as a sustainability interface between the organisation and its operational environment. EMS must interconnect in meaningful ways with organisational culture from the 'bottom-up'. Yet its positioning as a platform for experts, regardless of how connected experts may be to the wider organisation, can dissuade non-experts, the 'intangibles themselves', from effectively engaging in the 'sustainability project'. Restructuring organisations so that everyone becomes an environmental managers is perhaps the only way of building an elusive, sustainable future.

3. Reforming the Airport EMS

The politics of global warming positions sustainability as a management concept, obliging organisations to measure and monitor their impacts. It is at this early stage though that conceptual problems concerning what sustainability actually means and what it looks like often entrench themselves – ironically encouraged by triple bottom line thinking. For instance, the first myth to be debunked when an organisation grapples with sustainability is the tempting assumption that economic sustainability translates to perpetually increasing profits (or balanced budgets) acquired through well planned, socially and environmentally sensitive practices.

A second suggests that sustainability is an appendage to Operational Health and Safety and Quality Assurance taken to a new level. This 'codified' approach to doing business can detract from the central thrust of sustainability, which is an appreciation of the meaning and importance of inter-generational equity understood in terms of resource access and opportunity. And a third myth already flagged is that sustainability is the responsibility of environmental management experts.

Nevertheless, increased interest in EMS should not be dismissed as cosmetic. There is evidence that organisations are beginning to use them to create solutions for making connections between their activities and a variety of impacts and negative externalities (Kimmet and Wikstrom 2006). This type of institutional learning should be celebrated. It demonstrates that regardless of the arguable virtues of 'pigeon holing' the sustainability challenge, some very good initiatives that are translating into institutional and cultural change, are emerging (Martin and Verbeek 2006). This in itself creates a role for those who would shape what sustainability would actually look like if everyone became an environmental manager. Recording and co-ordinating intangibles would be an important task for these new 'experts', with improved performance and outcomes at least an indicator of intra-generational equity success over time. This benchmark pivots on the assertion that the more empowered people are to manage their environment, the better environmental outcomes will be. From this perspective, measuring empowerment becomes the key objective, inviting input from organisational change insights and lesson learning from various accounts of entrepreneurial success.

Finally, the tensions between short and long term sustainability objectives are yet to be adequately resolved in the EMS. A way forward with this problem may well surface from the results of longitudinal studies where competitive success is derived from knowledge creation, intellectual capital and the like. This would provide detailed analysis of how these initiatives can translate into program implementation, capital investment, product and process development, customer relations, quality assurance, and strategic change (Leonard, 1998; Pfeffer 1998; Ulrich 1997). And it is the implementation of this knowledge that would demonstrate that the key to successful development and application of the EMS is an adequate and reliable flow of information. In other words, the systematic application of the collective human resource to the gathering and monitoring performance is a more significant driver of change and improved outcomes than reporting the harvested results by designated individuals, regardless of how much expertise they may have.

Institutions are neither rigid nor independent entities. Understood both formally and informally, they interact with, affect, and are affected by diverse organisations, agencies and a wide range of stakeholders. This occurs locally, regionally and internationally, and their collective management is fundamentally a governance problem. Increasingly, the governance 'brief' for managing institutional interaction has included environmental issues, based on the understanding that progress in terms of greater efficiency and impact reduction is a function of coherent strategic policy and implementation in what is a very complex institutional landscape characterised by competing and often very narrow interests. From this perspective, the project of introducing opportunities for stakeholders to work more co-operatively towards improved sustainability outcomes inevitably demands institutional reform to the extent that it is widely accepted that 'opting in' to environmental management is actually in the individuals' best interests. From this perspective, the EMS of the future will need to be above all a framework for the governance and sharing of knowledge.

This is not to suggest a diminishment of the current emphasis on issues such as water, land management, energy, biodiversity, land-based noise, cultural heritage, development projects, and tenant and contractor obligations, to name the major foci addressed in the 2009 Brisbane Airport Environment Strategy. What requires review is how these issues are tackled and by who. Increasing the duties of the average worker to monitor and report on environmental performance is not the solution. Rewarding idea sharing and divesting design and ownership of projects to the grassroots has proven to be far more beneficial across any number of contexts (Martin and Verbeek 2006). In this 'enabled' environment, the 'experts' simply attend to the direction-setting and the critical task of objective alignment (Kimmet 2007a).

4. Conclusion

The purpose here is not to adjudicate between the efficacy of a reformed institutional approach to EMS as opposed to the current expert-driven model, but to simply highlight that the tools of environmental management have lost touch with advances in organisational change research. Those advances unequivocally demonstrate that regardless of how clinical, efficient or insightful an EMS driven by environmental experts is, it will increasingly lose ground through compounding sub-optimal returns to a system governed by experts, but driven by all. Airports are yet to seriously take up this challenge to effectively demonstrate the broad scale inter-linkages between environment, society and economics.

Information is knowledge, and when fully disclosed, provides the building blocks for brand new management systems that look more like partnerships than technical processes (Kimmet 2007b). Making airport futures

more sustainable involves changing values, attitudes, expectations and most of all, behaviour. Traditional 'top-down' approaches where content is downloaded on a passive workforce will never bring about the type of change required to deliver optimal environmental outcomes. Most airport workers and stakeholders already have ideas about what can be done to make these precincts a little more sustainable. The collective and strategic harnessing of these ideas by equipping the 'ideaholders' with the resources and rewards for carrying them out is the kind of comprehensive reform that airport environmental management needs. As I conclude elsewhere, "frameworks of communication and trust that facilitates a transition from awareness to action is needed" (Kimmet 2007:47). I then proceed to explain that this is because:

- Workers are generally content with their unsustainable behaviour
- Rewards and savings from sustainability are often delayed and indirect
- Behaviour change can be slow, so messages need to be sustained
- Target audiences range from young adults to company directors, all with different motivators and understandings of sustainability and its implications
- Sustainability is a complex issue incorporating environmental, social and economic factors
- Experts are more familiar communicating with management than with users
- There are disparate and unformed views of what a sustainable …[airport]… looks like and how it can be acquired

The message delivered here is that all EMS in the future are likely to be a lot more devolved and communicative, through sheer weight of research informing their structure. Peet (2006:404) neatly explains why by pointing out that in every day life we tend to pay natural attention to "red light indicators" such as car horns, overdrawn bank balances, and a baby's hungry cry. Experts are seldom in a position to hear, see and respond to these signals. When it is widely understood that sustainability, and environmental management as a primary function of sustainability, is the product of universal commitment, we will start to see radical changes in the way the EMS is structured. Nothing is stopping airports being ahead off the curve.

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