EXPLORING FACTORS INFLUENCING ENVIRONMENTAL MANAGEMENT ACCOUNTING ADOPTION AT RMIT UNIVERSITY

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ABSTRACT

Purpose – The purpose of this paper is to explore the factors, either based on theories or reflecting participants' own concepts, that impede environmental management accounting adoption at RMIT University.

Design/methodology/approach – A research methodology of both deduction and induction was applied to interview data collected from eleven participants of RMIT University, Australia. The interviews were guided by eight propositions developed from a theoretical framework that considers four theoretical perspectives.

Findings – We found five key barriers – attitudinal, financial, informational, institutional, and management barriers, which could potentially retard accounting changes at RMIT University.

Practical implications – This paper provides a discussion of theoretical generalisations and implications for practice to encourage EMA to be embraced by universities.

Originality/value – This paper extends the applicability of EMA to the higher education sector by providing a theoretical framework that helps explain a lack of EMA utilisation.

Keywords Environmental management accounting, Theoretical framework, Barriers, University

Paper type Case study

Introduction

Environmental management accounting (EMA) can be defined as the generation, analysis and use of monetary and physical environment-related information for the internal management of organisational financial and environmental performance (Bartolomeo *et al.*, 2000; Bennett and James, 1997; IFAC, 1998; UNDSD, 2001). In the 21st century, EMA appears to be receiving increasing attention as poor environmental performance creates significant financial consequences for various organisations (Schaltegger and Burritt, 2000). Various international governments and professional accounting bodies have devoted significant resources to promoting EMA [e.g. the International Experts Group on EMA of the United Nations Division for Sustainable Development (UNDSD) and the International Federation of Accountants (IFAC)]. Research and studies regarding how management accounting can contribute to the environment are also well documented (e.g. Bartolomeo *et al.*, 2000; Bennett, Bouma and Wolters, 2002; Bennett and James, 2000; Bennett, Rikhardsson and Schaltegger, 2003; Burritt, 2004; Deegan, 2003; Gray and Bebbington, 2001; Gray, Owen and Adams, 1996; IFAC, 2005; Schaltegger *et al.*, 2008; Schaltegger and Burritt, 2000). However, universities have typically failed to be the focus of EMA-related research and studies (see Burritt, 2004 for a summary of available EMA studies). Arguably, this is due to a mistaken belief that universities do not generate significant environmental impacts. In view of the numbers of universities around the world and the increasing importance of service organisations in the world economy (of which universities are part) (WTO, 2007), the accompanying level of environmental impacts caused by the operations of universities is significant. Their environmental performance, in particular associated environmental costs[1], need to be managed.

Various initiatives and programs have been introduced by universities to control or minimise their environmental impact and associated costs (for example, Arvidsson, 2004; Bekessy *et al.*, 2002; Creighton, 1998; Delakowitz and Hoffmann, 2000; Flint, 2001; Forum for the Future, 2004; NWF, 2007; Penn State Green Destiny Council, 2001; Simkins and Nolan, 2004; Uhl and Anderson, 2001; Uhl *et al.*, 1996; von Oelreich, 2004). However, managing environmental costs from an accounting perspective is still lacking. This lack has led to the conduct of this study, which attempts to fill the gap by adding to the existing body of knowledge on the potential of EMA to be used for the management of environmental performance by service organisations in general, but universities in particular. Due to a lack of EMA application and implementation within universities (Chang, 2007), we intend to focus on exploring factors influencing universities to embrace EMA. Being an exploratory study, the research followed a qualitative, case study methodology (Yin, 2003). Eleven in-depth interviews with key individuals from RMIT University in Australia were conducted. Eight propositions developed from a theoretical framework that considers four theories were employed to guide the interviews in identifying factors that would either assist in, or impede, EMA adoption at RMIT University.

The remainder of this paper is organised as follows: Section 2 develops the theoretical

framework and its eight propositions; Section 3 describes the research methodology and methods; Sections 4 presents the results and discussion; Section 5 advances theoretical implications for EMA adoption within universities; and Section 6 concludes this paper.

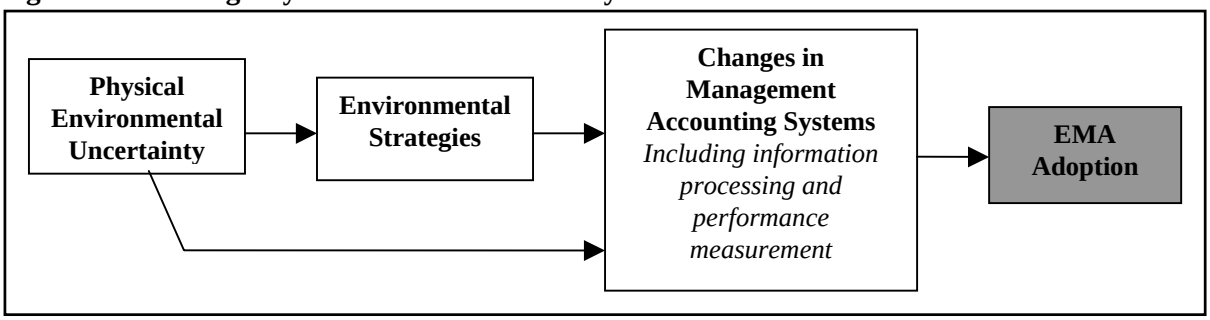
A theoretical framework to explain EMA adoption

This section provides a brief overview of the four theoretical perspectives suggested by the literature in relation to management accounting, environmental management or environmental accounting, which could provide explanations on EMA adoption. The four theoretical perspectives are drawn from contingency theory, institutional theory, legitimacy theory and stakeholder theory, which will be discussed in turn.

The contingency theoretical perspective

According to Osborn (2005), environmental uncertainty[2] seems to be a distinct contingency variable that can be linked to EMA (for more discussion of contingency variables, see Agbejule, 2005; Anderson and Lanen, 1999; Chenhall, 2003; Chenhall and Langfield-Smith, 1998; Covin and Slevin, 1989; Desarbo *et al.*, 2005; Emmanuel, Otley and Merchant, 1990; Gilley, McGee and Rasheed, 2004; Hoque, 2005; Langfield-Smith, 1997; Lofsten and Lindelof, 2005; Slater and Narver, 1994). Available evidence, although limited, also supports that perceived environmental uncertainty in the natural environment (hereafter *PEU*) is sufficient to influence environmental strategies and accounting practices within organisations (Lewis and Harvey, 2001; Ozanne and Menguc, 2000). The following figure shows the contingency variables adopted in this study and how the variables would influence EMA adoption.

Figure I: A contingency framework for this study



The literature supports the influence of business strategies as a moderating variable on changes in management accounting systems (e.g. Anderson and Lanen, 1999; Chenhall and Langfield-Smith, 1998; Gordon and Narayanan, 1984; Langfield-Smith, 1997; Lawrence and Lorsch, 1967; Lofsten and Lindelof, 2005; Macy and Arunachalam, 1995; Thompson, 1967). We argue that changes in environmental strategies would also induce modifications to the supporting management accounting systems for the purpose of providing information and reducing environmental uncertainties. The argument reveals two areas requiring further investigation to explore factors relating to EMA adoption – the environmental strategy (i.e. how universities ensure compliance with their environmental commitments), and the role of management accounting in implementing the strategy. In other words, *current environmental*

management practices constitute an area of concern, and *environmental strategy* undertaken could be a factor relevant to EMA adoption. Therefore, it is proposed:

P1: Universities that are signatories to environment-related agreements or declarations and strive to ensure compliance with the commitment would devote attention to minimise environmental impacts and/or manage environmental costs.

Information provision is an important function of management accounting. As organisational environment becomes more unpredictable, decision makers would tend to process more information to reduce the uncertainties (Gordon and Narayanan, 1984; Parker, 1997; Rayburn and Rayburn, 1991). If the natural environment itself became a source of uncertainty as argued by Lewis and Harvey (2001), EMA would be of great importance for organisations to provide environmental cost information. Parker (1997) concurs that there is a need to reclassify and reconfigure conventional management accounting systems in response to the increasing needs of environmental cost information. Therefore, we argue that if a university experiences a high level of PEU, it might innovate its accounting systems to provide information to minimise and manage associated environmental costs. In general, it is the senior management who makes decisions and shapes the organisational culture. They are the actors constructing accounting practices; accounting practices and systems can then be shaped by their behaviours (Covaleski, Dirsmith and Samuel, 1996). With such influence, senior management is able to determine whether accounting innovations are required, or what environmental information needs to be disclosed for establishing environmental credentials. Arguably, the driver to EMA adoption, in large part, lies in the support of senior management and their perceptions of *PEU*. *How environmental costs are accounted for and managed* is an area of concern. The following is proposed:

P2: The greater (lower) the physical environmental uncertainty perceived by senior management, the more (less) likely an EMA system will be adopted to provide environmental information to reduce perceived uncertainties.

It is suggested that a higher level of environmental uncertainty would impose pressure on managers and create a need for more and different information to evaluate organisational performance (Govindarajan, 1984; Thompson, 1967). As EMA helps provide both financial and non-financial environmental information (see IFAC, 2005; USEPA, 1995), an EMA system would be adopted when managers perceive a high level of PEU. However, it is also supported that negative financial conditions would create pressure on managers to increase profitability, and thus discourage them from concentrating on improving and measuring non-financial performance (Hussain and Gunasekaran, 2002). It seems that the decision to measure non-financial performance would also depend on the financial conditions of an organisation. This is also consistent with Osborn's (2005) argument that PEU may not effectively compete with other contingency variables in influencing EMA adoption. Although EMA has the potential to improve both financial and environmental performance, it would not be emphasised when an organisation is facing negative financial conditions. That is to say, *environmental performance measurement* could be an area of concern, but *efficiency or*

financial considerations need to be taken as a potential factor having impacts on EMA adoption. The discussion provides a rationale for the next proposition:

P3: Negative financial conditions increase the pressure on universities to improve financial performance, and therefore an EMA system that incorporates environmental cost information as part of performance measurement would not be considered.

The institutional theoretical perspective

Institutional theorists are concerned with understanding why organisations are similar, and why there is homogeneity in organisational forms and practices (e.g. DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Powell and DiMaggio, 1991). DiMaggio and Powell (1983) indicate that varieties exist in organisational forms and practices in the early stages of the life cycle of an organisational field[3], but homogeneity will eventually occur once a field is established. The process of becoming homogeneous is called isomorphism, which is described as "a constraining process that forces a unit in a population to resemble other units that face the same set of environmental conditions" (Hawley 1968, as cited in DiMaggio and Powell, 1983, p. 149). It is supported that this homogeneity would in turn stimulates, or hinders, adoption of new organisational practices, including accounting (Bansal and Roth, 2000; e.g. Bouma and van der Veen, 2002; Jennings and Zandbergen, 1995; Modell, 2002; e.g. Moll, 2003; Rikhardsson *et al.*, 2005).

DiMaggio and Powell (1983, p. 150) suggest coercive, mimetic, and normative as three mechanisms through which organisational changes can occur. Coercive pressure reflects the regulative and enforcing aspects of certain institutions, and represents an important determinant of the structure and function of organisations. The pressure forces organisations to change their practices to be consistent with the mandates of institutions (Granlund and Lukka, 1998). Within the context of universities, Cortese (1999, p.3) argues that 'without strong outside influence, higher education is not likely to change its direction far enough or fast enough' to make the transition toward sustainability possible. In the UK, revisions to the *Building Regulations*[4] introduced in 2002 require sufficient meters in new buildings to enable at least 90% of the estimated annual energy consumption to be accounted for by buildings (Bennett, Hopkinson and James, 2006). As a result, the number of universities embracing the metering technology is increasing (see HEEPI, 2007a). It seems that organisations, including universities, conform to the formal mechanisms imposed by governments in order to survive or grow as argued by DiMaggio and Powell (1983), or to receive support and legitimacy as explained by Scott and Meyer (1994).

However, as universities are typically not assessed on environmental performance, providing an account of environmental resources used, or waste generated, seems to be ignored (Bennett, Hopkinson and James, 2006; HEEPI, 2007b). Government pressure would be required for obligating universities to be accountable for funds received, including funds used for paying environmental costs incurred. Therefore, *coercive pressure of accounting for the environment* is an area of concern, and *government pressure* could be an important factor

influencing EMA adoption. It is proposed:

P4: The greater (lower) the government pressure on universities to provide an environmental account in relation to the use of funds, the greater (lower) the likelihood that universities would put in place an EMA system to account for environmental costs.

According to DiMaggio and Powell (1983), Organisations tend to copy, or imitate, each other as well as other institutions in society. If a practice has some recognised value, or is believed to be a new industry standard, organisations could simply imitate rather than questioning the value of this practice. This can be regarded as a mimetic process resulting from standard responses to environmental uncertainty. Some best environmental management practices in business organisations are brought into universities, such as appointing an energy manager, implementing an office automation system, and adopting energy reduction or resource recycling programs (see Shriberg, 2002). There are also an increasing number of universities providing sustainability reports based on the Global Reporting Initiative on sustainability (GRI[5]) guidelines (GRI, 2007). However, few universities are known to be implementing environmental initiatives strategically (Herremans and Allwright, 2000). Various forms of environmental management are conducted, but the effectiveness in improving environmental performance has sometimes been challenged (Bennett, Hopkinson and James, 2006).

Arguably, a lack of involvement from individuals with an accounting function explains part of the reason for the lack of environmental management being conducted strategically by universities. Epstein (1996, p. xxvi) states that “both the accounting and environmental areas are concerned about how to measure, report, and manage environmental impacts”. Bakker (1998) emphasises accounting as an important driving force for improvement in campus environmental management. Keniry (1995) suggests that changing accounting practices is one way to drive environmental accountability at universities. Without the involvement of individuals with an accounting function, environmental management might be “a patchwork of independent, autonomous functions (recycling departments, facility services, plant maintenance, etc.), that are not well coordinated, nor are they working toward a common goal” (Herremans and Allwright, 2000, p. 180).

This lack of involvement from accountants could be due to the mistaken belief that environmental costs generated by universities are not significant enough to be managed, in particular from a financial perspective. Therefore, we argue that the decision to manage environmental costs depends upon the importance of these costs being recognised in the organisational field of universities. Without environmental costs being considered significant, the decision to manage environmental costs would not be made. Further, if senior managers are not exposed to the benefits that embracing EMA can deliver, EMA is less likely to be adopted. In this circumstance, good stories about managing environmental costs would not be told, and best management practices would not be diffused and then imitated by other universities. Arguably, mimetic pressure would not occur. Therefore, *recognition of the*

importance of environmental costs within the organisational field of universities plays an important role in promoting EMA. It could be an area of concern for EMA adoption, and *mimetic pressure* could be a relevant EMA factor. The discussion leads to the following proposition:

P5: The decision to mimic best practice for managing environmental costs is contingent upon the recognition of the importance of environmental costs within the organisational field of universities. If the importance of environmental costs were not recognised in the organisational field, mimetic pressure would not be present, and it would be less likely that a university would adopt an EMA system to manage environmental costs.

According to Hoffman (2001), success of implementing environmental management initiatives in great part relies on cooperation and communication between managers with different education background and involved in different functions. Delmas (2002) indicates that managers tend to rely on their routines, and choose what is conceived as appropriate when the information they need for decision-making is not readily available, or when getting that information is not cost effective. The application of EMA within universities may represent such a case. Given EMA is a relatively new management tool, its costs and potential benefits may be quite unclear for first-time adopters. Besides, formal education influences the way individuals act and manage different issues. Individuals with different education background tend to have different opinions on how environmental performance can and should be managed (Bennett, Hopkinson and James, 2006), which could directly impact EMA adoption. Therefore, collective support from individuals directly involved in the decision process of managing environmental performance is vital to the success of EMA adoption. Without their support, EMA is less likely to be adopted. Therefore, *collaboration and communication between individuals involved in functions of environmental management and management accounting* would be an area of concern for this study.

Besides, creation of professional associations represents another important vehicle driving organisational changes. Several organisations are involved in developing environmental performance indicators, such as GRI, the International Organization for Standardization (ISO), Electricity Association (UK), and Environment Australia (see Deegan, 2003 for more information). The promotion of EMA in professional associations and accounting bodies has created some normative pressure for organisations to provide environmental reporting, or adopt some form of EMA. However, this pressure tends to be imposed on manufacturing industries rather than service-based organisations. The majority of available EMA studies are based on manufacturing industries. Further, the available EMA guidelines or documents were developed with the focus on organisations within a manufacturing context (e.g. IFAC, 2005; Ministry of the Environment, 2005). The normative pressure created so far appears to have only limited influence on EMA adoption within the service sector, in particular universities. Being ignored in EMA promotion by professional associations, universities are less likely to put EMA in place. A lack of *normative pressure* could impede EMA adoption, and it

represents a relevant EMA factor. Therefore, it is proposed:

P6: The greater (lower) the normative pressure imposed on key managers within universities to account for the environment, the greater (less) the likelihood that a university would put in place an EMA system for the purpose of managing environmental costs.

The legitimacy theoretical perspective

The theoretical perspective provided by legitimacy theory assumes there is a relationship between an organisation and the society in which it operates. Pfeffer and Salancik (1978) explain that organisations consume the society's resources, and society evaluates them on the usefulness and legitimacy of their operations. Organisations subject to the evaluation may attempt to achieve "congruence between the social values associated with or implied by their activities and the norms of acceptable behaviour in the larger social system of which they are part" (Dowling and Pfeffer, 1975, p. 112). The congruence, if achieved, between the perceived social values and norms may justify to society an organisation's right to continue to operate. This is the process of legitimation[6].

In addition, it is beneficial to introduce the concept of decoupling/loose coupling (Weick, 1976, p. 3), which has been widely used in management and accounting studies (e.g. Covaleski and Dirsmith, 1983; Elsbach and Sutton, 1992; Rautiainen, 2010; Siti-Nabiha and Scapens, 2005). Tooley and Guthrie (2007) suggest that the adoption of management accounting techniques have both a legitimacy consideration and a technical (efficiency and effectiveness) purpose. It is also argued that an organisation, or the key decision makers within that organisation, would enhance legitimacy by adopting new management techniques, but at the same time decouples them from daily routines to maintain technical efficiency (Meyer and Rowan, 1977). This could be true for EMA adoption within universities.

For example, there are various forms of environmental responsiveness by universities. Some universities analyse their ecological footprint in light of sustainability principles (Flint, 2001; Penn State Green Destiny Council, 2001); some undertake initiatives to increase energy efficiency, recycle, and reduce wastes (Bekessy et al., 2002; Forum for the Future, 2004; NWF, 2007; Uhl and Anderson, 2001); some conduct environmental audits to better understand environmental impacts (Creighton, 1998; Delakowitz and Hoffmann, 2000; Uhl et al., 1996); and some get certified under environmental management systems, such as ISO 14001 and EMAS (Arvidsson, 2004; Simkins and Nolan, 2004; von Oelreich, 2004). As mentioned previously, there are also a number of universities providing environmental reporting to demonstrate actions taken and progress made towards environmental sustainability (GRI, 2007). However, anecdotal evidence suggests that these environmental initiatives or programs are rarely carried out strategically. Carpenter and Meehan (2002) indicate that environmental management has not yet been accepted as a mainstream business activity in Australian universities. Herremans and Allwright (2000) observe that most universities in North America that report environmental information are merely demonstrating

what has been done on the campus, but do not provide further information on their environmental performance. Bennett, Hopkinson and James (2006) argue that environmental initiatives in the UK higher education sector only have limited impacts on improving environmental performance.

We argue that universities would respond to the expectation of the wider community to be environmentally responsible, and try to legitimise their internal accounting practices. Their accounting information systems, important for providing the justification and achieving legitimacy, would also be innovated and changed. *Strategies taken to gain or maintain legitimacy* could be an area of concern, and *legitimacy considerations* could have impacts on EMA adoption. It is proposed:

P7: The greater (lower) the community concerns on environmental impacts caused by universities, the greater (lower) the likelihood that universities would put in place an EMA system to manage the wider community and gain legitimacy.

The stakeholder theoretical perspective

Another view reflected in the literature is that organisations will respond to the demands of the stakeholder groups that control resources required for their operations (i.e. powerful or influential stakeholders), and they will tend to ignore the concerns of the groups without power (Belal and Owen, 2007; Deegan and Blomquist, 2006). Information disclosure can be used to gain or maintain the support of particular stakeholder groups. For example, if a particularly powerful or influential stakeholder group is concerned about the environmental impacts caused by an organisation, then that organisation might perceive a need to disclose information about efforts or initiatives that have been undertaken, or are about to be implemented, so as to alleviate some of the concerns held by the powerful stakeholders (Deegan and Blomquist, 2006). Bansal and Roth (2000) conducted a study on the motivations for adopting initiatives to mitigate their environmental impacts. They found that "firms motivated by legitimation were focused on the stakeholders most influential in prescribing or articulating legitimacy concerns" (Bansal and Roth, 2000, p. 727). We argue that putting an EMA system in place might be a means to legitimise a university's internal practices, if the pressure from influential or powerful stakeholders exists. *Actions from the powerful stakeholders* of universities could be an area of concern, and *stakeholder power* could be a factor having impacts on EMA adoption. It is proposed:

P8: The greater (lower) the concern of powerful stakeholders about the environmental impacts of a university, the greater (lower) the likelihood that a university would put in place an EMA system as a means to legitimise its internal practices.

A further discussion on overlapping theories

The above discussion reveals that institutional theory, legitimacy theory and stakeholder theory are overlapping in terms of issues relating to *legitimacy considerations* and *stakeholder power*. Centred on the two issues, propositions four, seven and eight appear, also, to be overlapping.

In terms of *legitimacy considerations*, institutional theory suggests that organisations adjust themselves to achieve legitimacy in response to institutional pressure. Legitimacy theory stresses that organisations can strategically manage pressures (including those from institutions), or threats, to their legitimacy. Stakeholder theory focuses on the influence of powerful stakeholders on organisations to appear legitimate. In terms of *stakeholder power*, institutional theory explains the desire to appear legitimate to institutions, such as government, a powerful stakeholder. Legitimacy theory emphasises the need to appear legitimate to the wider community, an ethical stakeholder with less power. Stakeholder theory highlights the desire to be legitimate, in particular to powerful stakeholders. Therefore, there are strong links among the three theories (Deegan and Blomquist, 2006).

As the government appears to be a powerful stakeholder in the university-related environmental management literature, proposition four appears similar to proposition eight. Proposition four has a focus on the influence of pressure from the government as a powerful stakeholder on organisational accounting practices. Proposition eight stresses the concern of powerful stakeholders, which also refers to the government, about changes in accounting systems. In terms of the desire to be legitimate, propositions four, seven and eight all propose that universities would change accounting practices to appear legitimate, but to different stakeholders. Therefore, the three propositions seem to be related not just to one theory. As there is no developed theoretical precedent for research in the EMA area, a joint consideration of the three theories is believed to provide valuable insights, and enables the provision of a richer explanation about the decision to adopt, or reject, EMA.

Research methodology and methods

Guided by the framework just proposed, we studied RMIT University in Australia and conducted eleven in-depth interviews as the primary source of data collection (see Creswell, 1994; Marshall and Rossman, 2006; Maxwell, 2005; Scapens, 1990; Yin, 2003). The role of the eight propositions is to inform the research and guide the interviews (Cooper and Emory, 1995; Gillham, 2000). A questionnaire was designed for the semi-structured interviews. Appendix I provides the interview questions, which are presented in a way highlighting the logic linking the interview questions to guiding propositions through research themes suggested by the proposed framework. The research themes are *physical environmental uncertainty, environmental accountability, institutional pressure, management's attitude to and views on EMA adoption,* and *stakeholder involvement or pressure.*

The purpose of dividing the interview questions into research themes is to ensure comprehensive and consistent coverage in each theme under study (Brenner, Brown and Canter, 1985; McCracken, 1988; Yin, 2003). Through the research themes, the questionnaire enables existing theories and the guiding propositions to act as a blueprint, yet it also allows participants to elaborate on issues that they think are relevant to this study. This design is required to allow specific questions and directions of the interviews to evolve contextually (Cooper and Emory, 1995; Gillham, 2000). It also helps lay a solid foundation to facilitate

data collection and analysis for this study.

As this study requires an understanding of how the major environmental costs are accounted for; and how management accounting plays, or could play, a part in managing the costs, both management accounting and environmental management are of special interest and concern. In accordance with this dual interest, it is required that at least one participant from the accounting division and the resources/facilities management division of RMIT University could participate. Further, Miles and Huberman (1994, p. 122) argue that "how you see life depends, in part, on your role". An analysis involving different management roles would be useful in identifying the potential EMA factors (Hoffman, 2001; Parker, 1997). Therefore, in addition to the five participants directly involved in the functions of management accounting or environmental management, we interviewed another six participants with different roles at RMIT University. In total, we interviewed eleven RMIT participants with four different types of management roles, namely senior management (five interviewees), heads/deans of academic schools (one interviewee), middle management directly involved in an environmental management function (three interviewees), and accounting managers (two interviewees). Appendix II provides a schedule of the participants, their positions and management functions, and interview mode.

The interviews were held over the period of April – December 2006. The interview times varied from thirty minutes to one and a half hours. Two of the eleven participants requested their names, or identities, not to be used, but all agreed to be recorded. An independent person was involved in transcribing the interviews. Transcribing depends substantially on the researcher to draw inferences and offer interpretations of the data (Marshall and Rossman, 2006). To cope with the inherent limitation and allow readers to consider not only the potential explanations we have suggested, but also other alternative explanations, we will provide detailed replication of quotes to reflect what participants have said in the section of results and discussion (Easterby-Smith, Thorpe and Lowe, 2002; Ferreira and Merchant, 1992; Patton, 2002). Deegan and Blomquist (2006, p. 255) concur that direct quotes help "guard, at least to some extent, against the authors providing their own, potentially biased, perspective of what interviewees were saying".

The method employed to analyse the collected data is content analysis[7] (see Miles and Huberman, 1994; Neuendorf, 2002; Patton, 2002). Patton (2002) explains that content analysis can be used to reduce qualitative data and identify important patterns or themes. We utilised this process to identify, code, and categorise primary patterns, or themes, in the text to reduce the interview data. It is suggested that researchers have some literature-based codes in mind as they begin the coding process, adding to the codes as the process unfolds. A list of initial codes was generated, which represent subcategories of the suggested research themes as presented previously, including areas of concern and potential EMA factors suggested by the theoretical framework. These codes were either "substantive" or "theoretical" (Maxwell, 2005, p. 97). Maxwell (2005) explains that substantive categories are mainly for describing participants' concepts and beliefs, and in a broad sense do not imply a more abstract theory,

whereas theoretical categories put the coded data into a more general or theoretical framework, and usually correspond to the researcher's concepts rather than representing participants' own concepts.

To assist with the coding, emergence of potential substantive categories, and management of interview transcripts, the qualitative research software package NVivo[8] was used. At the end of the coding process, codes (both initial and emerging) were checked and sorted into sets and subsets. Research tactics were used to achieve internal, external and construct validity as well as reliability (Eisenhardt, 1989; Miles and Huberman, 1994; Parkhe, 1993; Patton, 2002; Yin, 2003). This process delivered five sets of coded data that matched the study's objective to describe the factors impeding EMA adoption, namely *attitudinal*, *financial*, *informational*, *institutional*, and *management* barriers. They represent five key themes, or patterns, that emerged from the final coded data. Each key barrier contains two to four factors that provide further explanations on how the barrier potentially influences EMA adoption. The final coding structure is shown in the following table with the number of the eleven RMIT participants who made references to each factor and the frequency of references.

Table I. The final coding structure

EMA Barriers	**EMA Factors**	Number of Participants	Frequency of References
Attitudinal barriers	Low priority of accounting for environmental costs*	10	30
	Resistance to change*	8	17
Financial barriers	Efficiency or financial considerations	6	14
	Resource constraints*	7	13
Informational barriers	Difficulties in collecting or allocating environmental costs*	11	23
	Low physical environmental uncertainty	6	11
Institutional barriers	Lack of institutional pressure#	9	19
	Stakeholder power	7	11
	Legitimacy considerations	4	5
Management barriers	Lack of environmental responsibility & accountability*	11	22
	Lack of integrating the environment into strategic planning+	4	5
	Few incentives provided to manage environmental costs*	4	5
	Lack of advocacy from the university leadership*	3	3

Notes:

***** *Codes that emerged from the coding process*

 # The code was created to accommodate three initial codes, namely government pressure, mimetic pressure and normative pressure. The study found that the three types of isomorphism are not mutually exclusive, and they may co-exist in some circumstances (Mizruchi and Fein, 1999; Modell, 2002). Therefore, institutional pressure is used to represent the three types of pressure in the final coding structure.

+ The code captured comments about environmental strategy that were included in the initial coding structure. Environmental strategy was renamed as lack of integrating the environment into strategic planning in the final coding structure to better reflect comments made by the participants about environmental strategies undertaken by their universities in managing environmental costs.

Results and discussion

The case university, RMIT University, is one of the largest universities in Australia, with 70,247 students enrolled and 3,791 staff as of 2008. With major campuses in the Melbourne central business district and the City's northern suburbs, RMIT University offers TAFE[9] and higher education programs in 27 schools across three academic portfolios. The University committed to an environmental policy in 1994. Since then, the University has participated in

environmental sustainability commitments at both international and domestic levels. For example, RMIT became a signatory to the Talloires Declaration[10] in 1995, and the Commonwealth Greenhouse Challenge in 2000. Various internal environmental programs and initiatives have also been developed and adopted. Of particular note is that RMIT is recognised as the first university to establish a Global Sustainability Institute[11] in Australia. The Institute has been involved in developing new concepts and methods relating to global sustainability in practical ways so that they can be applied to the work of RMIT itself, and to organisations in the private and public sectors. The Institute is one of the main vehicles driving environmental sustainability across the University.

As for external environmental reporting, the University started to report environmental sustainability information in its annual report in 2000. The reported information included total quantity of environmental resources consumed at a whole university level. As for managing the major "environmental costs", we found that the current level[12] of EMA application is low in the University. There is a general lack of providing environmental cost information for the purpose of internal management. A review of the University's current practices revealed the following:

- RMIT's current accounting practices have a bias towards monetary environmental costs. The importance of physical environmental cost information for the purpose of environmental management tends to be ignored, in particular by managers in the accounting division.
- There is no link between systems for collecting monetary and physical environmental cost information. There appears to be only limited communication and collaboration between the two divisions responsible for environmental management and management accounting in terms of environmental issues.
- The major environmental costs (these being electricity, water and waste costs) are accumulated in an overhead account. The overhead is allocated to responsibility centres as a single occupancy charge on the basis of floor space occupied. There are limitations to the use of floor space occupied as the allocation basis. If there is a reduction in electricity usage by a centre, there will not be a corresponding reduction in the cost allocated to that centre because of the allocation basis. This could discourage managers from actively managing environmental costs.
- Only the cost paid for waste collection and removal is recognised as waste cost. Hence waste cost is understated (and therefore largely unaccounted for), because there is no explicit consideration given to the costs of bought in resources that end in waste.
- There is limited environmental accountability. Academic schools and other administrative divisions are allocated occupancy charges, but they are not provided with breakdown information on the major environmental costs that are included in the charges. Except for the division responsible for facilities management, no heads of academic schools, or key managers, are held responsible and accountable for the major environmental costs incurred.

Having provided a general description and an overview of the apparent environmental responsiveness of RMIT University, the following discussion will highlight various factors being identified as barriers to EMA adoption by the eleven RMIT participants. Also note that the frequency of the references, or comments, made cannot be determined by the quotes contained in the discussion. The quotes are provided mainly to support our interpretations of the results.

Attitudinal barriers

As shown in Table I, two coding categories were grouped under the attitudinal barriers, which include a *low priority of accounting for environmental costs* and *resistance to change*. A *low priority of accounting for environmental costs* appears to be a strong factor in explaining a lack of EMA adoption in terms of the number of participants making references (ten out of the eleven participants). This category contains the opinions, views and concepts of RMIT participants on accounting for environmental costs. Accounting for environmental costs does not seem to be what management is interested in. Although RMIT has apparent environmental responsiveness in reducing environmental impacts (as evidenced by the various environmental initiatives and programs undertaken), the University does not lead the way in this area. The financial manager in charge of the financial administration information system made the following comment:

> But no one has ever come to me and said, 'tell me the environmental cost of what we do'. So the whole chart of accounts is not set up to record anything that way. We account for projects but unless I knew of a project in Property Services or in a Portfolio, I wouldn't go and pick it out and say, 'here's our environmental cost'. So it's one thing that we've never been requested, even though it's not a new concept. We've never been requested to provide specific information about it. So from what I see, not that I see everything, it maintains a low profile (Associate Director, Budget & Financial Performance Management/RMIT University).

Professor Gardner, the Vice-Chancellor and President, explained:

> It's not that I wouldn't go to that more detailed look at indirect costs, but of the many things I have to worry about of indirect costs, this is not the first priority…. If you ask me in terms of the efficiency of our infrastructure, where I think we need to be investing, then yes, this is a priority, and we have to invest in it (Vice-Chancellor and President/RMIT University).

To the Vice-Chancellor, it seems more important to improve overall efficiency in terms of resources consumption than individuals being held responsible for the environmental costs incurred. The following quote highlighted the Vice-Chancellor's viewpoint:

> But until you've got what I call an efficient base, there's no point, well, there is a point around paper, things that you can get direct control over. But I'm talking here about the big ones, like energy and water, all the major improvements are not necessarily in the control of the individuals…. And even if everybody did turn off the lights, it would make almost no difference. I think it's important that I send appropriate signals. You only want to send big signals on things where people's behaviour would make a major difference (Vice-Chancellor and President/RMIT University).

Another accounting manager approached the issue of accounting for the environment from the education role of universities:

> They're aspirational issues…. Our primary focus must be the delivery of high quality of education and research, because that's what we are as a university – we're a centre for those two products (Associate Director, Business Advisory/RMIT University).

There is little doubt about the focus of universities being on education and research, but a neglected fact is that universities are "producing" graduates. From a business point of view, universities should put out as many quality graduates as possible at the least operating cost, of which environmental costs are part. It is also true that technical solutions, such as investments in metering and monitoring systems, make significant differences in overall efficiency, and the decision to bring in technical solutions is not in the control of academic schools. RMIT includes the major environmental costs in overhead accounts, and no heads of schools or administrative divisions are held responsible and accountable for environmental costs incurred. The General Manager of Facilities Services explained:

> It's asked recently that, 'should the Health and Safety be their responsibilities?' But I think environmental responsibility… they may believe that they're working at it. But I can tell you that they haven't phoned me up and asked me for what their electricity bill was… if they knew what that was, then they'd get a pretty good idea what it costs the University to make that facility available to them…. They presently don't do that sort of analysis (General Manager, Facilities Services/RMIT University).

Academic schools are not expected to worry about environmental costs as indicated by the Vice-Chancellor. Further, they are not assessed on environmental performance. It seems reasonable that they do not appear to be interested in environmental costs. The following quote from the perspective of academic schools provided further explanations about a *low priority of accounting for environmental costs*:

> I mean clearly they've got a bottom line effect, and things like energy costs can run out of control… but to be honest with you, I don't see that's a particularly high profile at this time, either within the University or external to the University (Pro Vice-Chancellor Business/RMIT University).

The second category, *resistance to change*, comprises the views or perceptions of participants about the attitudes of their colleagues towards accounting changes in managing environmental costs. As explained, a number of limitations exist in RMIT's current accounting practices, such as accumulation of environmental costs in overhead accounts. It is a common practice for service organisations to accumulate environmental costs, such as electricity and water, in an overhead account (Deegan, 2003). It is a general practice, but it fails to bring the costs to the attention of managers who are responsible for managing the costs. This reduces the chance to manage environmental costs as they are considered as costs that would be incurred anyway. For example:

> But things like gas and electricity and whatever, they're just standard things. And now you're making me feel guilty, but they're standard things and you'd have to incur the cost regardless (Head of School/RMIT University).

Further, since it is a common practice, people might not like to change it. The Vice-President of Resources said:

> So I think that's the main issue. But that's not unusual in any large organisation, because the centre always streams off new things for the business to do and the business says, 'enough is enough' (Vice-President Resources/RMIT University).

The role of internal practices for universities also seems to be neglected (i.e. they are not practicing what they preach). Consider the following comment:

> If the cost to produce a graduate could be established, they could see how profitable it is to provide more graduates. To take a business point of view, we're making cars or bottle tops or things like that, you are trying to put out as many quality units as possible at the least operating cost. Universities do not look at their business that way (General Manager, Facilities Services/RMIT University).

Traditionally, universities are assessed mainly on education quality and research output. There are no bonus or reward systems for improvements in internal practices as indicated by the Executive Director of Property Services. Things that could impact the outcome of teaching and research have to be dealt with carefully (e.g. cost allocation and performance measurement). The Vice-Chancellor explained:

> I am actually trying to encourage them [to do research]. So what if I send them a signal that says all the researching schools should stop, people should do less, be at work less…. That's not a good signal…. So it seems to me that my first priority is what I call the gross efficiency, and that's what I've been focusing on, and we still have a lot left to do there. The second thing is where we can institute system changes that will reduce overall costs for everyone, that's our first priority, that's our first activity. And I am less in favour of turning off the fountains than I am in putting in infrastructure that will provide better overall use of water, because, as between those two things, I think the infrastructure that provides the overall use of water is better, might be more expensive, but is more important than turning off the fountains (Vice-Chancellor and President/RMIT University).

The concern about EMA might result in unfavourable responses, or reactions, by academic staff would directly impact the decision to adopt, or not to adopt, EMA. The resistance to make changes from common practices traditionally used within universities has impacts in shaping accounting practices. Further, due to the concern about unfavourable reactions induced by EMA implementation and the doubt about the influence of EMA on behaviour changes, RMIT would also hesitate to make accounting changes. In either case, EMA is less likely to be adopted.

Financial barriers

As shown in Table I, the financial barriers consist of two factors, namely *efficiency or financial considerations* and *resource constraints*. Building from the contingency theoretical perspective, the factor of *efficiency or financial considerations* refers mainly to the comments about cost and benefit aspects of EMA adoption and implementation. For example:

> Whilst we don't do that, I think that is a good idea. To do that, there is obviously a cost associated with it: obtaining information and reporting information. That would have to be weighted up in terms of the cost versus benefit (Associate Director, Business Advisory/RMIT University).

It seems that only when a business case could be demonstrated would EMA be adopted. There is much evidence that a business case currently exists as there is clear evidence in the literature that accounting for environmental costs can ultimately lead to real cost savings (and related benefits for the environment) (e.g. Ditz, Ranganathan and Banks, 1995). It also

appears that senior management in the University has been exposed to such literature. The Pro Vice-Chancellor Business and the Vice-President of Resources both mentioned about the benefits deriving from managing the major environmental costs during the interview. However, in spite of the future benefits (both financial and environmental) that EMA can deliver, EMA still cannot appear to pass the financial cost hurdle. Senior management recognised that EMA has the potential to generate cost savings but admitted that cost and benefit considerations would have impacts on EMA adoption. It should also be noted that there were different opinions from participants on whether EMA could ultimately result in benefits. This might be part of the reasons why EMA could not pass the financial cost hurdle. For example:

> From our financial management point of view, that's just like internally allocating them the expenditure without a lot of return (Executive Director, Property Services/RMIT University).

Convincing people that EMA really leads to benefits seems to be required to clear the perceived cost versus benefit barrier.

The second factor, *resource constraints*, includes the human and financial resources that would be required to support the extra work as a result of the decision to adopt EMA. Six out of the seven participants identifying the constraints stressed that the University's infrastructure should be taken into account when making environment-related decisions. RMIT has 140 buildings, of which most are old, and some are under historic preservation orders. Thus, most of the effort undertaken to improve environmental performance is centred on upgrading the infrastructure. However, with most of the resources being used to improve the infrastructure, there seems to be no more resources allocated to implement EMA. Several participants made it apparent that resource constraints would be a significant EMA barrier. More specifically, a Pro Vice-Chancellor stressed that financial sustainability could be the only barrier:

> It's important to consider where RMIT is. You have to have the capacity to be able to do it, and up 'til now, we haven't. So I think when you look at it in that historical context, I think provided we retain financial viability into the future, you'll see more action out of RMIT…. That's the major impediment. It's about financial sustainability. But if we cross that hurdle, then there would be no other major impediment other than the other extra accounting charges and all of that, there's no political impediment, the only impediment is really I think financial (Member of the Vice-Chancellor's executive team/RMIT University).

By inference, the above comments would suggest that *resource constraints* could potentially impede EMA adoption.

Informational barriers

The informational barriers were derived mainly from the contingency relationship between physical environmental uncertainty and information processing. Therefore, physical environmental uncertainty and difficulties in information processing are the focus of the discussion. As shown in Table I, a *low physical environmental uncertainty* and *difficulties in*

collecting or allocating environmental costs were identified as factors that could impact EMA adoption.

The factor of *difficulties in collecting or allocating environmental costs* appears to be a strong factor that explains a lack of EMA implementation within the University. All of the eleven RMIT participants mentioned some form of difficulties in collecting or allocating environmental cost information. Environmental managers focused on the technical aspect of difficulties in collecting information, whereas financial managers approached the issue from a different perspective. Two participants with the role of environmental management indicated that the absence of a comprehensive metering system at RMIT makes it challenging to collect and provide better information. Three participants, with the role of management accounting, recognised the importance of providing better environmental cost information, but they had different opinions on why the University did not provide such information. Managers involved in a management accounting function focused more on problems relating to environmental cost allocation. The Associate Director of Budget & Financial Performance Measurement was concerned with whether the allocation practice is common to other universities. The Senior Accountant mentioned the difficulties in proposing an appropriate allocation basis. The Associate Director of Business Advisory also saw the problem associated with the allocation basis, but questioned whether the allocation process would deliver benefits to the University.

Senior managers also expressed their opinions on the issue of environmental cost information processing. Some recognised the problems with the lack of environmental cost information. Some expressed their concerns about whether academic schools or portfolios have any control over environmental costs incurred. This also implied a concern about whether the allocation of environmental costs would be fair to schools or portfolios. The Vice-Chancellor and President gave an example to explain the concern:

> I'll give you a good example. On one of our campuses, we have a school, it's a campus that is not particularly used, this is Brunswick, it's not a crowded, not an overcrowded campus. That school gets allocated to it the costs of all those buildings that it's associated with. But it's not that that school really wants to use all those buildings, it's just that it's the only school occupying that space. So you get a certain amount of artificiality with some of these things, because there's a question to which, how much of it's in the school's control (Vice-Chancellor and President/RMIT University).

A cost allocation mechanism that shows clear cause and effect relationship seems to be required for the University to consider allocating environmental costs, which only requires additional management accounting to complement existing systems. A technical solution is to separately meter buildings, which was mentioned by the two environmental managers. However, it seems that senior management was not convinced. The Vice-Chancellor and President said:

> Well, the truth is, I don't know that it would be fair to allocate the costs… the school itself, in fact, probably would not be able to do anything, unless you metered each floor, and the question is, 'is that the first thing you'd do to drive down the cost of the building?' (Vice-Chancellor and President/RMIT University).

To reduce environmental costs, metering certainly is not the first thing to do, if there are no robust management mechanisms in place to ensure that information collected is used effectively. However, it is a starting point for benchmarking and better understanding of activities and infrastructure that drive environmental costs. EMA implementation requires environmental cost information. Without the technical support, collecting the required information could be a barrier to EMA adoption.

It is also interesting to note that the importance of better environmental cost information was recognised, and the problem for not being able to provide better information was identified. However, the priority to implement technical solutions for the provision of required information was rated low. The reason could be tied back to the contingency relationship between PEU and environmental cost information processing.

The provision of environmental cost information is an important function of EMA. If the perspective of information processing is taken, perceived physical environmental uncertainty could be interpreted as the result of decision makers experiencing a lack of environmental cost information. As the physical environment becomes a source of environmental uncertainty, decision makers would tend to process more relevant environmental cost information to reduce the uncertainties. Therefore, the level of perceived environmental uncertainty could directly impact the decision of managers to collect or allocate environmental costs.

Experiences and comments from RMIT participants suggested *low physical environmental uncertainty*. Although some environmental regulations are now in places and would eventually have impacts on universities, these are all voluntary and not specific for universities. In considering environmental resources used and possible future regulations on the use, it was indicated:

> The universities are tied to certain degree with the Government, but again in this particular corner of Australia, where there's cheap brown coal, I don't know if it'll be around – the imperative is going to come out over ten years (General Manager, Facilities Services/RMIT University).

The fact that Australia has abundant natural resources (e.g. brown coal) significantly reduces uncertainties associated with the supply of resources and regulations on the use. This reduces the level of perceived PEU and impacts organisational decisions to control and manage the consumption of natural resources.

In terms of the behaviour of environmental stakeholders, such as the community and regulators, pressures are mounting, but not directly on universities. Comments from the participants about environmental policies and regulations, environmental resources used, and concerns of environmental stakeholders appeared to suggest a low PEU within the University. The result is consistent with the University's current accounting practices for managing environmental costs. For example, RMIT has a low level of EMA application, and the priority of environmental cost processing is also low.

Institutional barriers

The institutional barriers include a *lack of institutional pressure*, *legitimacy considerations*, and *stakeholder power*. Institutional pressure could be government pressure, mimetic pressure or normative pressure. All the three factors under the institutional barriers are theoretically based. As shown in Table I, a *lack of institutional pressure* appeared to be a strong factor in explaining a lack of EMA adoption. Nine out of the eleven RMIT participants commented on the absence of institutional pressure on universities to account for their environmental costs. The following quotes reflected perceptions by the participants, with four different management roles. The response of a senior manager was:

> No, no external pressure to the University. And there is very little discussion on it, but it's [environmental cost] been measured, as I said, at the macro level…. That's interesting. So I may not think it's always a question of hearts and minds. I mean, there are one or two solutions, one is externally imposed by regulations…. That's one reason you do things, because you have to. There are penalties around these consequences if you don't. The other reason is you choose to do things, but why? Mechanisms we do within the University are for societal benefits, because we want to, because we believe it… I don't see that we can register the same sort of imperative in terms of those environmental issues (Pro Vice-Chancellor Business/RMIT University).

The comment of an environmental manager was:

> For this particular government, no, I don't think they will [impose the pressure to account for environmental costs]. But I don't think it's far off. As I said earlier, the state Government now requires us to buy 10% green energy (General Manager, Facilities Services/RMIT University).

A financial manager said:

> … I think people care about cost, but only to the fact that it influences their personal outcome. So whilst the University is a fictitious beast, it's a bunch of individuals working under one banner. So does the University have it's own personality? Yes, it does. Does the community then recognise that personality, and say yes they should be reducing their costs? I don't think the nexus is linked to the community at this point (Associate Director, Business Advisory/RMIT University).

A head of academic school indicated:

> Not major enough. No. Because obviously they influence financial reporting, they've influenced what goes into the University's accounts, but not in management accounting. They haven't. So if there were a standard, an accounting standard on that [environmental cost], then it would obviously influence the University. If government and the accounting body… yes that's right, if there was that sort of accountability (Head of School/RMIT University).

The pressure could be related to the government, the wider community, and professional accounting bodies. They do not seem to exercise any pressure on universities to account for their environmental costs. In terms of what would trigger universities to do so, again the three types of pressure (normative, mimetic, and normative) were all referred to as important in influencing accounting practices. Comments included:

> I guess what other universities do. If other universities put more in their reports here and there, if there's some sort of public scrutiny of it, if something gets in the papers … something like that, then that would put a focus on it…. (Associate Director, Budget & Financial Performance Measurement/RMIT University).

> Well, we are a very big organisation, we have 56,000 students around the world, we have thousands of staff, we have a very big infrastructure, and so we are a producer of greenhouse gas, we must be. So to the

> extent that we're part of the problem, it has to be a matter of some importance to us. I think your project, the green office project, pressure is mounting on us to be more active than we have been (Member of the Vice-Chancellor's executive team/RMIT University).

> Triple bottom line is being addressed, but it's still a very peripheral issue. I think the major issue in the accounting body at the moment is harmonisation to international accounting standard, which I suppose has taken a lot of attention over the last three years (Associate Director, Business Advisory/RMIT University).

However, coercive pressure was still regarded as the most important pressure in driving accounting changes. Seven of the RMIT participants indicated that coercive pressure, in particular from government, plays an important role in promoting environmental initiatives or reporting practices. According to the interview with the General Manager of Facilities Services, the Victorian Government has imposed a requirement for universities to purchase at least 10% green power, and also requested universities to report back about the environmental initiatives being carried out. RMIT has fulfilled the 10% requirement. However, the General Manager of Facilities Services said, 'if there isn't any external pressure, it will be a slow process'. Mimetic pressure could also be required for accounting changes. The Associate Director of Budgets & Financial Performance Management predicted that it could become a general practice to report environmental sustainability information in annual reports of universities, because "if corporations do it, then the University ultimately will" (Associated Director of Budgets & Financial Performance Measurement/RMIT University). If universities would choose to report environmental information because business organisations report the information, then they might consider adopting EMA because there are an increasing number of corporations having implemented EMA. However, as no external pressure has been imposed on universities for improving internal environmental accountability, EMA is an issue that is still not in the "spotlight".

The category of stakeholder power contained the coded data in relation to concerns and expectations of stakeholders (either with or without power) interested in the environmental issues relevant to universities. Some participants indicated that they feel no pressure from stakeholders (either with or without power) to control the major environmental costs. For example:

> No, I don't feel any pressure at all from stakeholders, no (Pro-Vice Chancellor Students/RMIT University).

Some participants said environmental issues are not what stakeholders (e.g. students and researchers) are concerned about. For example:

> Students are much more concerned with getting good teaching…. I don't think they'd be concerned about the environment (Head of School/RMIT University).

> Well, clearly the governments think they are key stakeholders, but in my view the most important stakeholders are the students and the researchers and we need to be driven to some extent by what they think are the key priorities. We do regular surveys on the top ten issues in the minds of our staff and students…. Better student services or better classrooms, they're clearly on the top…. We don't exist just because we want to exist. We're here because people want to buy our services. They're willing to pay a price, whether to the federal government as loans for higher education or as fee-paying students and they're the people who drive what we do. The market demands certain things and we have to deliver. No doubt about that (Vice-President Resources/RMIT University).

> It comes back to what impacts an individual is more important to what impacts an individual's position, and then what impacts an individual's community. So the individual should always come first. That's human nature. Ok, my tuition fee's my first point of interest. The second thing is that, 'is the University financially stable?' … I think they're probably more important to students than how much paper and how much water we use each year (Associate Director, Business Advisory/RMIT University).

Environmental issues do not seem to be what the influential stakeholders (i.e. students and researchers) are interested in. However, there are still a few stakeholders worrying about these issues, but they are considered not to be particularly visible and powerful. For example:

> There are a few, but they are not particularly visible… Well, we've got Global Sustainability. They worry about these things… But I have to be brutally honest and say if it's not in the senior level, it's not having a significant impact. It's not having a significant impact (Pro Vice-Chancellor Business/RMIT University).

The stakeholders, such as the Global Sustainability Institute, have some influence, but since they do not have "formal power", their influence is limited. Powerful stakeholders, such as government, do not seem to exercise pressure on universities to control their environmental costs. Due to a lack of interest and attention from stakeholders, in particular those with power, in accounting for the environment by universities, it is less likely that RMIT would put into place an EMA system for the purpose of controlling environmental costs.

The category of *legitimacy considerations* captured data on an organisation's desire to manage the perceptions of their stakeholders in terms of legitimacy. *Legitimacy considerations* do not appear to have strong influence on EMA adoption within the University. Only four participants mentioned the desire to gain legitimacy as a motive to account for the environment. Comments by the four participants were:

> If we do something that's really good and really successful, we want the good news to be run outside to the people. You know before we practice we preach. So within the boundary we can do it, because we still financially have to be very careful. What would be motivated is actually to say this is something we have achieved and link it into the public side (Associate Director, Budget & Financial Performance Measurement/RMIT University).

> Yes, we've signed several, Talloires Declaration, Greenhouse Gas Challenge, the Sustainable Energy Authority of Victoria…. I think there're enough in there to drive us to do the right thing (General Manager, Facilities Services/RMIT University).

> There's no doubt. In the short, very short term, it [accounting for the environment] will have a negative impact but in the longer run, it will have a positive impact because our reputation will be enhanced, we will attract more people who want to be attracted to an organisation that is more environmentally conscious (Vice-President Resources/RMIT University).

> And I think reputation is important, but, to be honest with you, I don't see that's particularly high profile at this time, either within the University or external to the University (Pro Vice-Chancellor Business/RMIT University).

The desire to gain legitimacy appeared to motivate the University to report good news, to sign environment-related agreements, and to implement environmental management initiatives. By so doing, the University would appear as a good corporate citizen and improve its reputation as an environmentally conscious organisation. Indeed, the desire to appear legitimate motivated the University to be engaged in reporting environmental information and undertaking environmental initiatives. However, it is still not significant enough to drive

management accounting changes. Findings in the University appeared to support the theoretical relationship between organisational legitimacy and organisational survival. EMA was not seen as a way to legitimise internal practices. A lack of EMA implementation would not undermine the license to operate, or long-term survival. As such, implementing EMA was not considered as a priority.

Management barriers

The management barriers include four factors. They are a *lack of environmental responsibility & accountability*, a *lack of integrating the environment into strategic planning*, *few incentives provided to manage environmental costs*, and a *lack of advocacy from the university leadership*. As shown in Table I, a *lack of environmental responsibility & accountability* appears to be a strong factor in explaining a lack of EMA adoption. All the eleven participants commented on this issue. The University's current practices do not reflect an attempt to make key managers accountable for their environmental performance. No heads of academic schools, or deans, have any form of environmental targets, or budgets, imposed within their work plans. The Senior Accountant identified the problem:

> If they had their own budgets and their own measures [tied to particular attributes of environmental performance], then they would monitor and control that regularly. It's the nature of the way people are. If they are not being held accountable for it, then they are not really going to worry about it (Senior Accountant, Property Services/RMIT University).

The Facilities Manager concurred:

> No, I don't think the heads of portfolios would be grilled as to why their operating costs are increased (General Manager, Facilities Services/RMIT University).

The Pro-Vice Chancellor Business said:

> I don't pay those bills. I don't pay the water bill, I don't pay the energy bill, [and] I don't pay the cost of managing all the wastes we generate, so there is no imperative there. I do, however, pay for the telephone usage, so I was interested in that and said, 'well, let's try to keep our telephone cost down, because that's better for us and increases the money for other purposes' (Pro Vice-Chancellor Business/RMIT University).

The comment by the Pro-Vice Chancellor Business highlighted the importance of providing information about the consumption of resources, and linking the control of resources consumption to the work plans of key managers. The Pro Vice-Chancellor Students also mentioned the absence of consequences for not controlling environmental costs:

> But I have to say, if I use too much electricity in my office, I don't know what would happen to me (Pro Vice-Chancellor Students/RMIT University).

Evidence showed that the responsibility and accountability to manage environmental impacts and associated environmental costs is now all on Property Services. It is a common practice to charge the overall environmental responsibility and/or accountability to the division responsible for facilities management. However, without the responsibilities being allocated to academic schools or other administrative divisions (those being the users of environmental resources), the effectiveness of managing environmental costs would be

limited. The Vice-President of Resources said:

> Well, in the longer run, given that I'm the Vice President of Resources, I think it will be my responsibility to effectively manage our use of the environment and the costs of the resources we utilise, so I expect that it will come from me. That needs to be shared with everybody else in the organisation, because I can't manage that on my own (Vice-President Resources/RMIT University).

It seems that this aggregated environmental responsibility would discourage managers from actively managing environmental costs. As key managers are generally not held responsible and accountable for environmental costs incurred, an EMA system that can be utilised to improve environmental accountability would be less likely to be implemented.

The category of a *lack of integrating the environment into strategic planning* was derived from the contingency theoretical perspective, which emphasises the influence of environmental strategies on organisational accounting practices. We looked at the University's strategic plan and environmental policy as an indicator of its strategic position about environmental issues. RMIT has generated some positive outcomes from the environmental management programs and initiatives. However, its environmental policy has not been revised since its adoption in 1994, the targets for key environmental indicators have not been set, many of its environmental commitments have not been adequately resourced, and the action plans to meet requirements of these commitments have not yet been implemented. They are the issues that require further attention and resolution. The problems were reflected in some of the University's internal documents. Comments on the issues included:

> I think that's [updating environmental policy] good because it makes it more visible, more conspicuous out there, but if I can put it this way, that sort of thing is necessary but not sufficient, because RMIT is always making policies, but does it actually mean anything? So it's not just that we make policies, the next question is, 'well, what does this mean on the ground and how are you going to implement it?' (Member of Vice-Chancellor's executive team/RMIT University).

> You might say that there's prescribed legislative requirement to be accountable, but we do aspire in this area, and we do make reference to that in our annual report. But do we then take that to the next level? I don't think we do. So I think it's aspirational rather than directional at this point (Associate Director, Business Advisory/RMIT University).

A look at the University's most recent strategic plan revealed that the only available environmental indicator is *infrastructure quality,* which describes the goal of "75% of buildings classified as satisfactory by the Tertiary Educational Facilities Management Association by 2010". Obviously, the University has a main focus on improving its overall infrastructure quality as stressed by the Vice-Chancellor. This focus also echoes the way environmental costs are managed within the University (i.e. an aggregated environmental responsibility and accountability). However, it is still not clear how far this strategic position would influence EMA adoption due to the limited comments from only four participants.

A number of studies pertaining to the barriers to the "greening" of universities have established "a general lack of incentives and information on environmental issues" to be among the most important barriers to the adoption of environmental initiatives (e.g. Meyerson and Massy, 1995; NWF and ULSF, 2001; Sammalisto and Arvidsson, 2005). Likewise, we found that the factor, *few incentives provided to manage environmental costs*, impedes EMA

adoption. This could be due to a practice of measuring performance against budget as indicated by the Executive Director of Property Services. A Head of School also provided some explanations about why striving for reducing costs is not necessary:

> I think another reason why we haven't focused on trying to reduce expenditure is because if we make a surplus in any year, we lose it. It just goes to the centre. So there's been no incentive to try to reduce costs. I mean there're all sorts of reasons and I could go on and on…. There just wasn't the incentive to do it (Head of School/RMIT University).

No incentives, coupled with no pressure to manage environmental costs, make the factor a barrier to adopting EMA practices within the University.

As not all of the members of the Vice-Chancellor's executive team participated in this study, it would not be appropriate to draw the conclusion about whether the senior management supports EMA adoption. However, one of the executive team members indicated a lack of time commitment in the issue:

> I guess it's because we haven't captured the hearts and minds at the senior level…. Partly we never take time to do it. Secondly, we probably have other things on our mind from time to time. Yeah, that was probably the main reason. But this sort of issues would've been identified and go to the senior executive members of the University, maybe two, three, four times a year…. How much discussion do they have? Three, four minutes a year, maximum, where we probably just recorded that's very interesting and then moved on, because it doesn't seem to be any imperative or relative to the other parities…. There's no compulsion to do this [accounting for the environment] (Pro Vice-Chancellor Business/RMIT University).

It seems that environmental costs are not what the senior management is interested in. For example:

> We've different accounts. So we think, 'ok, how can we capture costs properly?' You know, at the end of the day, what is management interested in? They're interested in how much we spend on travel and how much we spend on consumables. So would they ask how much we spend on the environment? … They never have, or it hasn't come through to me… They may discuss it at different forums. But it would be very hard to measure (Associate Director, Budget & Financial Performance Management/RMIT University).

The following comment further supported that the University's leadership does not seem to demonstrate the level of advocacy required for managing environmental issues:

> I've been to a couple of presentations by Monash where the Vice-Chancellor gets up and talks to a lecture theatre centre full of students, staff, outsiders, all interested in improving environmental management, and he'll answer questions from them. He's not afraid of the questions out there that might be asked that might put him on the spot. RMIT's not in that field yet (General Manager, Facilities Services/RMIT University).

Given the role of EMA to support environmental management, a reasonable extension of the above-mentioned quotes is that EMA is less likely to be adopted because of a *lack of advocacy from the University leadership* in environmental management.

Theoretical implications

Within the context of RMIT University, the eight propositions developed from the theoretical framework were confirmed based upon the above discussion. We found that there is a general lack of EMA implementation at RMIT University. This lack of EMA utilisation could be explained by the theoretical perspectives embraced in this study. With little doubt, there is an

overlap among the different theories, or the theoretical perspectives. Different factors suggested by different propositions would also have common implications for practice. However, collectively the factors suggested by the proposed theoretical framework offer more compelling explanations of the lack of EMA adoption, and provide valuable implications for practice to encourage the uses and applications of EMA within universities. For example:

- There appeared to be a lack of integrating the environment into strategic planning. Proposition one predicted that an organisation would modify specific aspects of its accounting information system to match certain defined environmental strategies (if any) so that environmental management programs would be conducted strategically.
- There appeared to be a low level of perceived PEU. Propositions two and three predicted that a high level of PEU would be required to trigger universities to process environmental cost information, and incorporate the environment into performance measurement. Government pressure is a major source of this physical environmental uncertainty.
- There appeared to be a lack of pressure from the government, a powerful stakeholder. Propositions four and eight predicted that actions from the government with formal power would lead to responses by universities to put in place systems for collecting and reporting required environmental cost information.
- It appeared that environmental costs are not considered significant by key stakeholders within the organisational field of universities. Proposition five predicted that increasing the perceived importance of environmental costs is critical in creating pressure that encourages the management of environmental costs.
- There appeared to be a lack of involvement of accountants in the process of managing environmental performance. Proposition six predicted that normative pressure would be required to encourage and legitimise the involvement of accountants in the process.
- It was found that a general lack of legitimacy considerations being given to EMA as a means to reduce environmental impacts and manage associated costs within universities. Propositions seven and eight predicted that the utilisation of EMA as a means to appear legitimate would lead to the implementation of EMA systems for the purpose of managing environmental costs.

Future research directions

Due to the exploratory nature of this study, there remains a plethora of areas in which future research can be directed. The following are some examples of future study that could stem easily, and directly, from this research.

There appeared to be a lack of institutional pressure on universities to account for their environmental costs. The research approached this issue from the perspective of key managers within universities. It would help reveal why the pressure is not present by understanding the perspectives provided by different institutions, such as governments and the wider community.

The research found that the priority of accounting for the environment remained low in the case university. In addition to a lack of institutional pressure, it was also due to a lack of participation by key managers, with an accounting function, in the process of managing environmental performance. Given the role of information provision, management accounting has an important role to play in this process. Future research could address this issue by seeking ways to encourage and legitimate the involvement and participation of accountants in the management of environmental performance.

A literature review highlighted a lack of EMA-related case studies in a university setting. Additional case studies in this area appeared essential. By doing this, best practice examples of the ways in which management accountants can be involved in environmental management will emerge, and benefits arising from embracing EMA will be reported and established.

It appeared that guidelines tailored to suit the special needs of universities in managing environmental costs are also required. The research found that the informational barriers, such as difficulties associated with collecting, allocating, and reporting relevant environmental information, would retard EMA adoption. Research into the classification and categorisation of environmental costs, or the development of an environmental reporting framework specific for service organisations, such as universities, would help to overcome some of the informational barriers that currently exist.

Final concluding remarks

The role of universities for environmental sustainability involves two issues – education itself and internal practices. The research results and findings revealed that there was a general absence of systems designed to manage environmental costs within RMIT University. Arguably, this is not a problem specific to the University, but is one that is possibly common to many other universities.

It should be borne in mind that we focused on RMIT University as an in-depth case study. Although the results ccould be generalised to the other universities, they are perhaps somewhat critical of RMIT University. Indeed, it is somewhat surprising that RMIT University, which in many other facets of environmental practices leads the way, has not led the way in this area of accounting for the environment. However, key staff are ready to consider the issues as shown by the openness and transparency demonstrated in this paper. In concluding, the results do highlight the potential uses and applications of environmental management accounting, and its ability to improve environmental sustainability within universities. Let’s wait and see which university takes the necessary lead in accounting for the environment!

Notes

[1] In this paper, the term environmental cost is interpreted more broadly as including material and energy used to produce goods or provide services, and the input costs associated with wastes being generated (e.g. the capital costs, labour costs, or costs associated with the consumption of material and energy to produce the waste). In particular, we focused on four costs that are typically chosen for organisations implementing EMA (see Deegan, 2003), and are especially important for environmental management in a university setting (see Bennett, Hopkinson and James, 2006; Creighton, 1998; HEEPI, 2005; Herremans and Allwright, 2000; USEPA, 2003). These are costs associated with the consumption of energy, water and paper, as well as the generation of wastes, all of which are termed "major" environmental costs for the purpose of this study.

[2] "Uncertainty" arises as the result of decision makers experiencing a lack of information about future events (Galbraith, 1973; Lawrence and Lorsch, 1967; Rayburn and Rayburn, 1991).

[3] By an organisational field DiMaggio and Powell (1983, p. 148) mean "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resources and product consumers, regulatory agencies, and other organizations that produce similar services or products".

[4] The *Regulations* implement part of the *European Energy Performance of Buildings Directive* (EPBD), which sets minimum requirements for the energy performance of all new buildings and large renovated buildings, and requires energy certification of all buildings and the display of information on energy consumption and carbon dioxide emissions of public buildings (HEEPI, 2007a).

[5] As a 'collaborating centre' of the United Nations Environment Programme, the GRI has a vision to promote the practice of reporting on economic, environmental, and social performance by all organisations as routine and comparable as financial reporting (GRI, 2007). Its guidance – *Sustainability Reporting Guidelines* – is provided to achieve the goal and promote international harmonisation in reporting. Total energy used, energy per square foot, energy per capita and greenhouse gas emissions are some examples of physical environmental information that can be included in sustainability reports. More than 1,000 organisations around the world report their sustainability information using the GRI guidelines, including banks and universities. See http://www.globalreporting.org/AboutGRI/ for more information.

[6] Lindblom (1994) argues that there is a need to distinguish between legitimacy and legitimation. Legitimacy is described as a condition that exists when the two value systems of organisations and society in general coincide. Legitimation is considered as the process that leads to the state of legitimacy.

[7] For the purpose of this study, content analysis is regarded as a research method that utilises a set of scientific procedures to make valid inferences from data collected (Weber, 1990).

[8] NVivo is the qualitative research software developed by Qualitative Solutions and Research (QSR) International Pty Ltd. It is primarily oriented to studies with detailed mark-up, retrieval, and description of textual content. It is based on the organisation of coded text via a system of concept nodes, such as logical connections or relationships. These codes can stand-alone or be grouped hierarchically in a tree structure. The system allows texts to be coded by words, sentences or paragraphs, and then easily sorted within that particular code.

[9] Technical and Further Education (TAFE) institutions are a type of adult education organisations in Australia. TAFEs offer a wide range of predominantly vocational tertiary education courses. In contrast to the higher education sector mainly funded by the Commonwealth Government, TAFEs are owned, operated and financed by various State and Territory Governments.

[10] It is the first declaration made by university top management of a commitment for universities to sustainable development. As of 2009, 15 Australian universities are signatories to the Declaration, including RMIT University (ULSF, 2009).

[11] Now in the State of Victoria, Australia, Swinburne University of Technology, Monash University and Victoria University of Technology have also established similar centres.

[12] EMA can be applied to support decision-making, performance measurement and external environmental reporting. It also helps improve environmental accountability. The levels of EMA implementation can range from the provision of environmental cost information for internal management to the adoption of a more comprehensive accounting system that integrates monetary and physical information systems.

APPENDIX I: INTERVIEW QUESTIONS

Research Themes	Interview Questions	Guiding Propositions
Physical environmental uncertainty	1. Are you aware of any compulsory regulations, or requirements, on universities to control, or reduce, their major environmental costs? If yes, what are they? If no, do you think the government will impose compulsory regulations on universities to control, or reduce, their major environmental costs?	**P1** **P2**
	2. Are any internal pressures forcing the university to account for any of its impacts on the environment? Who imposes the pressure? How does the university react to the pressure and what are the actions taken?	
	3. Are you aware of any environment-related regional or international agreements, or declarations, singed by the university? If yes, what are they and do you think the university is able to ensure the compliance and meet the requirement?	
	4. Do you think it should be an important issue for universities to control their major environmental costs? Is it an important issue for the university now?	
Environmental accountability	5. Who is currently held accountable for the major environmental costs incurred? How are they held accountable?	**P3** **P4** **P7** **P8**
	6. Have you ever requested any environmental cost information from accounting, or environmental management related administrative divisions? If yes, what is the purpose of requesting such information? If not, why not?	
	7. In terms of managing environmental costs, to whom or for what do you feel the university is accountable to/for?	
	8. Who do you think should be held accountable for reducing environmental costs, individuals, administrative divisions, or academic schools? Are they held accountable now? If yes, how? If not, why not?	
	9. Are you personally held accountable for any of the major environmental costs? If not, do you think you should be held accountable?	
	10. Does the university issue any internal report on environmental performance? If yes, at what level is the environmental performance assessed and what is the purpose of issuing this report? If not, why not (e.g. not mandatory, not a normal practice in universities, or not cost effective)? Are there any impediments, either technical or political, to provide an internal report on environmental performance?	
Institutional pressure	11. What would trigger the university to consider the major environmental costs when making management decisions?	**P4** **P5** **P6**
	12. Are any external pressures forcing the university to account for any of its impacts on the environment? Who imposes the pressure? How does the university react to the pressure and what are the actions taken?	

(To be continued)

Management's Attitude to and views on EMA adoption	13. Do you think it would/wouldn't benefit the university to bring the major environmental costs to the attention of the decision makers, both academic schools and administrative divisions? What makes you think so?	**P2** **P3** **P6**
	14. Do you think the university has provided enough incentives to motivate academic schools or administrative divisions to control, or reduce, environmental costs?	
	15. How do you see the potential use of EMA practices in providing such incentives?	
	16. Do you think the university should provide major environmental cost information as a means to increase environmental awareness and encourage behaviour change? If not, why not? If so, whom do you think should be provided with this information (consider in your answer both academic schools and administrative divisions)? What do you think would be the major barriers (either technical or political) to the provision of such information to heads of schools or internal managers?	
	17. What type of environmental cost information, physical and/or monetary, should be provided? Why do you think so? What are your views on internal use of such information in the future?	
	18. Do you, within your role in the university, think management accounting is of importance in managing the major environmental costs? Please explain your answer, either if yes or no, based on the three management accounting functions, namely capital budgeting, cost allocation and performance measurement.	
	19. What is your opinion on the separate identification and allocation of the major environmental costs? Is it possible for the university to do so? Why?	
	20. What is your opinion on key managers being held accountable for the major environmental costs incurred? Is it possible for the university to do so? Why?	
	21. What is your opinion on key managers being given environmental KPIs against which their performance is assessed? Is it possible for the university to do so? Why?	
Stakeholder involvement or pressure	22. Do you think stakeholders of the university care about what the university has done, or will do, to manage its major environmental costs, for example the wider community, students, faculties, media, pressure groups, or the government? If yes, who are they?	**P4** **P7** **P8**
	23. Do the stakeholders who care about what the university has done, or will do, have the power to force the university to change its current management or accounting practices to manage environmental costs? What makes you think so?	

(End)

APPENDIX II: PARTICIPANTS AND INTERVIEW INFORMATION

University	Participant	Position	Management Function	Mode
RMIT University	Margaret Gardner	Vice-Chancellor and President	Senior Management	In person
	Chris Whitaker	Pro Vice-Chancellor Business	Senior Management	In person
	Stephen Somogyi	Vice-President Resources	Senior Management	In person
	Joyce Kirk	Pro Vice-Chancellor Students	Senior Management	In person
	Anonym (R1)	Pro Vice-Chancellor	Senior Management	In person
	Chris White	Executive Director, Property Services	Environmental Management	In person
	Graham Bell	General Manager, Facilities Services	Environmental Management	In person
	Paul Stockwell	Senior Accountant, Property Services	Environmental Management	In person
	Wayne Poole	Associate Director, Business Advisory	Management Accounting	In person
	Anne Stewart	Associate Director, Budget & Financial Performance Management	Management Accounting	In person
	Anonym (R2)	Head of School	Academic School	In person

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