

The Implementation of an Environmental Management System in the Not-For-Profit Sector

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Purpose

This paper examines the implementation of the Eco-Management and Audit Scheme (EMAS) in a non-profit, small to medium sized enterprise (SME) in the UK.

Methodology

A four year Participatory Action Research study is made upon Knowledge Transfer Partnerships between the University of the West of England and the Royal Bath and West Society.

Findings

Through the adoption of EMAS the organisation was able to identify operational improvements as well as make significant efforts to improve its environmental performance, reducing its carbon footprint by 30 tCO₂ e per annum and gaining new business.

Research Limitations

The study is made upon a single not for profit organisation in the UK.

Practical Implications

It presents the costs, benefits and challenges that the organisation faced. Techniques that were used to successfully manage the EMS development are also discussed.

The investigation identifies deficiencies in the materials that are provided to support companies that are seeking EMAS certification. To improve the uptake of these environmental management systems and assist companies in their successful pursuit of ISO14001 and EMAS, this supporting documentation requires enhancement.

Originality

There has been relatively little empirical research around the development and benefits of organisational environmental management systems (EMS). Even less has focussed upon the specific constraints and opportunities that face non-profit organisations when implementing EMAS. This paper addresses this gap, identifying its costs and tangible benefits.

1.0 Introduction

The importance of managing 'green' issues in organisations has been recognised for a considerable length of time (Pane Haden, Oyler and Humphries, 2009) however, recently corporate attitude towards the environment has become of greater interest to the public. Internal efforts have been primarily driven by potential economic benefits but organizations are facing increasing external pressure to reduce the environmental impact of their activities. These pressures arise from legislation that governs the effects of their actions and often places targets for emissions and waste reduction (White, Jenkins and Roberts, 2011). External pressure also arises from the market's complex expectations that an organization will endeavour to act responsibly for the long-term benefit of the wider society (DEFRA, 2011). Consequently the strategic directions of organisations are not based upon financial measures alone (Finkbeiner, Wiedmann and Saur, 1998).

SMEs are a significant and highly heterogeneous sector of commerce. Discounting micro-enterprises of less than ten employees, small and medium-sized organisations accounted for around 88% of UK enterprises in 2008 (URS, 2010). They are often constrained by factors that are not just related to their size, but also by issues such as their ownership status and whether they are for-profit or non-profit making (White, Samson, Rowland-Jones and Thomas, 2009; Cairns, Harris, Hitchison and Tricker, 2005; Hillary, 2004). Non-Profit organizations in particular are an important sector (Barrett, Balloun and Weinstein, 2005) and are an increasingly significant part of the economy (Benz, 2005).

Non-profit organizations possess characteristics that are very different to for-profit organizations (Hull and Lio, 2006: p53), particularly in terms of their often-complicated strategic missions and financial limitations. For example, non-profit organisations are often constrained both historically and geographically to the market that they serve (Hull and Lio,

2006) and face significant financial demands from legislative and bureaucratic administration requirements (McGregor-Lowndes and Ryan, 2009). SMEs represent a multifaceted grouping faced with a disparate set of circumstances that would benefit from further analysis (Hillary, 2004) of which non-profit organisations are a particularly complex component.

Traditional legislation that imposes minimum environmental requirements upon all classes of organisations and industries is notoriously difficult to structure such that it is applicable and relevant in all cases without being overly burdensome upon specific firms (White, Jenkins and Roberts, 2011; Hillary, 1995). Though numerous approaches are available to guide and continuously improve environmental practice, the environmental management systems (EMS) presented in ISO 14001 and the Eco-Management and Audit Scheme (EMAS) are the most widely adopted approaches by organisations (EMAS Newsletter, 2006; Ruzicka, 2004; Leads, 1997).

This paper explores the challenge of implementing an Environmental Management System (EMS) in a non-profit SME organisation in the Southwest of the UK. The paper is structured as follows. First a review of the literature presents the background and development of EMAS and ISO14001. Next the paper examines the BS8555 'Acorn 6-Step' framework for achieving EMAS certification before outlining the expected benefits and challenges that arise from EMAS adoption. The research method explains the case study selection and action research approach to study. Third, the results give detail of the implementation challenges faced by a team from a not for profit organisation. Finally, the discussion and conclusions present the implications for theory and practice as a result of this work.

2.0 Environmental Management Systems

The relationship between EMAS and ISO14001 has not always been clear. Political drivers initially meant that attempts were made to differentiate them (Palomares-Soler and Thimme, 1996; Klaver and Jonker, 1998). It was proposed that the EMS certification produced through ISO 14001 would fail to assure that an organisation was striving to achieve the environmental performance which it was ultimately capable (Klaver and Jonker, 1998). EMAS was promoted as a means of focusing a companies' attention upon the public disclosure of their goals and achievements and upon the management systems which deliver these goals (Legislators, 1999). Previously perceived as a competing approach, ISO 14001 is now presented as a stepping stone toward EMAS and bridging plans between the two have been discussed (IEMA, 2009; EU Prepares, 1998; National Guidelines, 1996; Transatlantic Sparks, 1995; Akzo Nobel, 1995).

From its inception, ISO 14001 was created to cater for the needs and capabilities of SMEs, whereas the suitability of EMAS to this economic sector has not been so certain (Hillary, 2004). To address this issue the latest amendments to EMAS regulations specifically cater to the challenges faced by SMEs, particularly in relation to the frequency of auditing and to ensure that verification or validation is not prohibitively costly (IEMA, 2011). Increasingly ISO 14001 and EMAS are becoming more aligned and complementary in nature. In the United Kingdom for example, the BS8555 'Acorn' scheme (IEMA, 2009) provides a common pathway for SMEs to work towards EMAS and ISO 14001 certification.

The fundamental difference between the two approaches is that ISO 14001 covers the management system whereas EMAS examines environmental impact and emissions information (Honkasalo, 1998). However, that is not to say that ISO 14001, correctly implemented, cannot have a positive effect and continuously improve environmental performance. Similarly, the road to achieving EMAS certification is likely to require that

considerable attention is paid to management systems. Whichever approach is adopted it is necessary for an organisation to complete a detailed analysis of its operations, as Honkasalo (1998) ventures, EMS development requires detailed analysis of the systems and technologies of an organisation.

3.0 EMS Adoption

There is little evidence to indicate whether ISO 14001 or EMAS ultimately results in superior environmental performance. However, it can be construed that in many cases it matters more to stakeholders, certainly public stakeholders, that the environmental impact of an organisation is being managed effectively than whether it is being done so under the guise of ISO 14001 or EMAS (Honkasalo, 1998).

The specific nature of the sector of commerce is a significant determinant of the rate of uptake of ISO 14001 or EMAS. The tourism industry for instance had been slow to adopt environmental auditing practices, particularly among the smaller companies (Goodall, 1995). An exception is the German tour operator TUI, a large-scale for-profit enterprise, which added environmental aspects to its holiday guest's satisfaction survey, further supporting the view that customers have been becoming increasingly environmentally conscious (Iwand, 2005).

Cases of dual ISO 14001 and EMAS adoption have been reported and underline the potential for symbiosis between the two standards (Torraspapel, 2008). Non-industrial examples of adoption include Varese Ligure, a town in Northwest Italy, notable as being the first EU community to have achieved both ISO 14001 and EMAS certification. The effects of the implementation were to reduce overall power consumption, eliminate the chlorination of potable water supplies and promote a switch to more organic methods of farming. The town recreated itself, moving from a condition of continual decline to being an economic, social

and environmental success (Rags to Riches, 2007). Dettenkofer et al (2000) report the successful EMAS implementation in a hospital where it has been used to control and reduce the environmental impact of medical care. Such examples evidence the potential applicability of ISO14001 and EMAS to non-profit organisations and challenge claims that EMAS has a narrow range of applications and is only applicable to the industrial sector (Honkasalo, 1998).

4.0 Implementation of EMAS

The development of an EMS as outlined in BS8555 paves the way for an organisation to pursue ISO 14001 and/or EMAS certification. UK SMEs may follow the ‘Acorn’ 6-step scheme, detailed in figure 1, that aims to guide them through development of an appropriate EMS (IEMA, 2009). Organisations embarking upon the programme would typically begin by examining their current processes and practices to ensure compliance for example, before moving on to detailing initiatives to improve their systems and performance (Figure 1).

[Insert Figure 1 Here]

Details of Stage 1 of the scheme are provided in ‘The BS8555 SME Workbook’ (IEMA, 2012b). The workbook further divides this stage into seven phases and provides a range of supporting documents and case study examples (Figure 2). At present, the other Stages of the scheme are not supported with guidance workbooks, requiring individual firms to create their own solutions to meet the stated goals.

It should be noted that the IEMA materials use the terms ‘stage’ and ‘phase’ interchangeably. This is confusing for companies pursuing the Acorn Scheme and, more significantly, may prove to be problematic during audits. Throughout this paper the term ‘stage’ shall be used to refer to the six main steps of the Acorn scheme, and the term ‘phase’ shall be used to refer to the activities that are undertaken within each stage.

[Insert Figure 2 Here]

4.1 Benefits of EMAS implementation

The benefits of developing an effective EMS are many and varied, stretching beyond the explicit purpose of reducing an organisation's environmental impact. Hillary (2004) categorizes the internal benefits as either organisational, financial or people related and the external benefits as commercial, environmental or communication related, while White and Lomax (2010) indicate the knowledge-generative potential of environmental initiatives. Strachan, Haque and McCulloch (1997) list the common reasons for adopting EMAS that comprise, in descending order of benefit, public relations, sales and marketing, finance, personnel issues, influence over suppliers, and regulatory pressure. IEMA (2009) also highlight the reported benefits of EMAS implementation in SMEs. They are identified as those that are internal, comprising employee motivation and morale, cost and efficiency improvements, improved management and training quality, and improved legal compliance, and those that are external comprising new customers, increased customer satisfaction, reduced pollution and increased recycling. The reported benefits of EMAS seem to underplay its immediate or predicted value to the environment. It is not apparent if this is because the road toward certification genuinely results in greater operational benefits than environmental benefits, or because companies still need to be convinced of the return on time and effort invested. Clearer quantification of the benefits of EMAS adoption would be of great interest to those organisations contemplating, and costing, the development of EMAS. Until the environmental benefits of such a system become the prime, if not sole, reason for its adoption then public stakeholders may be unconvinced of the organisation's true motives.

Consequently the current marketable value of EMAS adoption may be considerably less than anticipated.

EMAS, though voluntary, is understood to be attractive to many organisations for the marketing benefit that it may provide to a firm as well as its operational and financial benefits. Hillary (2004) suggested that customer demand for goods and service from firms that are environmentally aware has been the key driver for firms in their decision to develop an EMS. However, it appears that many SMEs are in fact developing an EMS voluntarily (Kehbila, Ertel and Brent, 2009) or in response to increasing pressure from a wide variety of stakeholders (Harrington, Khanna and Deltas, 2008). Public disclosure of environmental performance is required by EMAS, which acts as a driver for continuous improvement.

Within free-market economies where 'green' issues are becoming of strategic and commercial importance it therefore has dual benefit, both as a marketing tool and as a driver that managers can use when implementing change and performance improvement activities.

The market value of EMAS is significant for non-profit organizations as this form of organisation needs to be aware of the external environment and act upon these drivers to satisfy stakeholders (Barrett, Balloun and Weinstein, 2005). Consequently, market-oriented non-profit organisations are reported as performing better when achieving their strategic objectives (Modi and Mishra, 2010). However, the legitimacy of this argument is questioned. Honkasalo (1998) asserts that implementing systems to achieve EMAS purely for its marketability is misguided, whereas Hillary (1995) maintains that EMAS utilises the market economy to encourage competition in environmental performance, and Strachan (1999) concludes that EMAS can have marketable valuable.

4.2 Challenges in EMAS Adoption

4.2.1 Information

Goodall (1995) raises the issue of environmental auditing that may uncover “*incriminating information*” (p35) and in turn may dissuade organisations from adopting EMAS. The case for commercial confidentiality is cited as a way for organisations to withhold some potentially damaging information. Public openness is a cornerstone of EMAS and the latest regulations specifically detail that commercially or industrially confidential information is to be reported, though provision is made for reporting to be done in a manner that would not damage legitimate economic interest (IEMA, 2011).

4.2.2 Costs

One of the main issues faced by organisations considering the development of environmental management systems is that of cost. This is particularly important for SMEs and may be a significant prohibitive factor for non-profit organisations. Not only can cost be incurred during the development and implementation of the EMS but also during the preceding period when time is spent evaluating the alternative EMS systems to adopt. Furthermore, the on-going costs of maintaining the EMS, in continuously improving environmental performance, and in reporting that performance in the case of EMAS adoption, must also be factored into the total cost. Hillary (2004) further reports the dis-benefits of EMS implementation as resource and cost based, the lack of reward or return on the investment, or as ‘surprises’ and the unexpected consequences of EMS implementation.

4.2.3 Measures of Performance

The establishment of performance indicators is an important concern for non-profit organizations, but they need to be developed in such a way that they become valuable and reliable inputs to decision-making processes (Mayston, 1985). Financial governance and reporting is still of vital importance to non-profit organisations (Jegers, 2010) but reporting

non-financial performance measures and accomplishments is seen as a key component of their long term success (Gordon, Khumawala, Kraut and Neely, 2010).

One of the most important aspects of EMAS, that make it successful, is the establishment of meaningful improvement targets (Honkasalo, 1998). Klaver and Jonker (1998) argue that approaches such as benchmarking and the use of performance indicators can be valuable drivers of improvement even for schemes such as EMAS: significantly, EMAS regulations stipulate a range of performance indicators that organisations are obliged to report (EMAS, 2011). However, benchmarking data is unavailable in some sectors of commerce either due to the necessity for confidentiality and secrecy, or even because that sector has yet to adopt or accumulate any measures of environmental performance.

5.0 Research Context and Methodology

This research project takes the form of a four-year Action Research study, drawing upon two consecutive Knowledge Transfer Partnerships (KTPs) between The Royal Bath and West Society (RB&W) and the University of the West of England (UWE). The first KTP of three and a half years duration developed the environmental management systems and the second 'short' KTP of six months duration was an extension of the initial KTP, utilising the same staff, and oversaw the final phase of the Acorn process to gain ISO 14001 and EMAS certification.

KTPs are part funded ventures whereby an Associate is employed to undertake a significant project for an organisation, supported by experts and academics from university (KTP, 2011). The partnerships between UWE and RB&W were undertaken to design and implement accredited quality and environmental management processes and culminated in the achievement of ISO14001 and EMAS certification. In addition to the operational

improvements experienced by RB&W the KTPs were found to deliver a range of tangible and intangible benefits to the partnering university (White, Wang and Freeth, 2009).

Action Research (AR) places the researcher in a position that is immersed to greater or lesser degrees within the research environment, in order to undertake first-hand and detailed observation. The origins of AR are most usually associated with the work of Kurt Lewin (Gronhaug and Olson, 1999; Eden and Huxham, 1996; Masters, 1995; Susman and Evered, 1978). The extent to which researchers are immersed in the field of research varies to great degrees, from passive acquirer of knowledge to catalyst of organisational change (Gronhaug and Olson, 1999; Eden and Huxham, 1996; Masters, 1995). Whyte (1989) proffers Participatory Action Research (PAR) as a form of action research that is distinct from other forms in which it is practiced, and was adopted in this study. PAR is an approach that mirrors the purpose of Knowledge Transfer Partnerships and *“combines participant observation with explicitly recognised action objectives and a commitment to carry out the project with the active participation in the research process by some members of the organisation studied”* (p369). PAR (Whyte 1989) requires the statement of the process by which the research is undertaken in order to improve its contribution to theory (Whittemore, Chase and Mandle, 2001). The reliability and validity of interpretive enquiry, and AR in particular, can be improved through the identification of key themes (Miles, 1979) using cyclic capture and analysis of data (Miles, 1979; Becker 1958) over extended periods of time (Sanday, 1979). Data capture was undertaken via semi-structured interviews with the KTP Associate and the other five members of the implementation team, of two hours duration, at each phase of the project outlined below. The semi-structured interview questions were operationalised in advance, and were modified, or others were included, during the interview process to investigate salient or interesting issues (Bryman 2008). Interview questions were cyclically developed between phases of the implementation to explore the specific aspects of that phase.

Field notes were also compiled throughout the duration of the partnership project. These were instantaneously sampled (Paolisso and Hames, 2010) to capture pertinent and interesting points that presented themselves during formal project meetings, informal discussions with the Associate and other members of the organisations, telephone conversations and email correspondence. The field notes were used to aid the cyclic development of new questions and refine existing lines of enquiry for the planned semi-structured interviews.

Transcripts and field notes were thematically coded and analysed (Guest, MacQueen and Namey, 2012; Boyatzis 1998). Coding was undertaken manually to identify the themes of the benefits and challenges to EMAS adoption, discussed in sections 4.1 and 4.2, and to identify emergent topics. Topics were validated through discussion with experts involved in the partnership and employees of RB&W.

5.1 The Royal Bath and West Society

RB&W was founded in 1777 and hosts a wide range of outdoor events that attract over one million visitors each year, but is primarily known for its annual show that attracts over 160,000 visitors. The decline of agriculture and increase in environmental awareness of the general public has prompted an expansion of its role whilst simultaneously created a need to improve its competitiveness among growing numbers of environmentally and rurally focussed government and regional agencies. Modern objectives include the education of a wider audience in the “ways of the countryside”, contribution to the development of the South West of England’s regional strategy and promotion of environmental management and non-food crop opportunities among local farmers.

Prior to the research project the organisation had initiated a substantial environmental redevelopment venture. A strategic review identified ISO 14001 and EMAS as potential goals that would maintain the momentum of the on-going management systems development

activities but also result in a more market-valuable achievement. As suggested by some of the literature (Hillary, 2005, 2004; Strachan, 1999), EMAS was viewed as a more market-valuable credential for this particular organisation.

6.0 Analysis

6.1 PHASE 1 – Establish Baseline

The process of gaining Executive approval to work toward gaining EMAS certification took approximately six months. While the strategic value of EMAS was recognised the tactical and operational issues surrounding the costs, timescales and method of managing the project required considerable research, training and attention. In order to better understand the requirements of EMAS the KTP Associate undertook training in the form of the IEMA ‘EMS Implementation’, and ‘Environmental Auditing’ courses. Enlisting the assistance of an experienced accreditation body was found to be of great value and assistance, supplementing the EMAS guidance documents themselves. Ultimately though, many questions surrounding the predicted costs and benefits of obtaining EMAS were a ‘best guess’ by the project team. However, the strategic importance of gaining certification ultimately outweighed the remaining doubts over the bottom-line benefits of certification.

After briefing the organisation’s management and staff on the structure and content of the Acorn scheme, detailed in section 4.0, the most significant difficulty entailed identifying and securing the necessary human resources. Despite its national and international reputation RB&W is a small, lean organisation, dictated in part by its non-profit nature, and comprises 27 employees. Resources to support the development of an EMS were therefore sparse, with individual’s taking time out from other core and daily work to support activities.

Additionally, and as highlighted in White et al (2009), many of the organisation’s employees

had previously had little exposure to modern business practices, thereby reducing the pool of potential human resources to select leaders from even further.

The final implementation team comprised four members of staff plus the Chief Executive and the KTP Associate. The four additional staff were selected by the Chief Executive and the KTP Associate based upon, in order of importance, their current level of authority and responsibility for the organisation and its environmental conduct, their knowledge and commitment toward general environmental concerns and their availability. Also included in the team were several environmental sceptics, their presence and perspective of the project serving as a valuable litmus test of the persuasiveness of the decision-making processes and the effectiveness of the project activities. All members performed their duties as part of the EMS team in addition to their everyday roles and responsibilities.

Hillary's (2004) use of the term 'surprises' as a category of the dis-benefits that the development of an EMS may generate is an apt descriptor for some aspects of the project. Examples of such 'surprises' emerged during initial audits of the 240 acre site which revealed areas where fridges and other domestic appliances had been illegally tipped, and even a fire engine which had fallen into disrepair had been abandoned. This serves to indicate that even significant environmental hazards, overlooked on a day-to-day basis, will be revealed through a detailed site audit.

Additionally, while investigating water and energy consumption it became apparent that the organisation was being overcharged for its electricity. A spur from RB&W supplied electricity to a neighbouring dwelling. Even though this was metered, the supply had not been deducted from RB&W's bill since the property had been built over ten years ago. While these examples may appear atypical they are indicative of the level of detail of analysis of operations that is required when working toward EMAS.

6.2 PHASE 2 – Ensuring Compliance

One of the main difficulties encountered during this phase was created due to the composition of the implementation team. The team comprised a varied number of personnel from across most of the organisation's departments. Coordinating the activities of multiple personnel and their documents across a large site and over an extended period of time was enabled through the extensive use of information technology. Electronic systems were used to support existing channels of communication rather than introduce new ones, in order to minimise resistance to new ways of working (Iverson and Burkart, 2007): this predominantly involved the utilisation of direct and mass email, and the establishment of an environmental portal on the organisation's intranet through which files and folders could be shared and worked upon dynamically.

One of the considerable predicted problems at this stage would be to understand the vast array of legislation that was relevant to the organisation. This is not to suggest that the organisation was not already compliant but the challenge would be for the implementation team to become familiar with the details of the requirements so that they could generate suitable management procedures and carry out the necessary improvements to buildings and equipment etc. In order to assist with this process a consultant was hired to provide expert advice and guidance. In further discussion it transpired that many individuals possessed very narrow knowledge of the relevant legislation for the different parts of the EMAS, however, the consultant confirmed that collectively they possessed knowledge of the majority of the requirements. The challenge was not the acquisition of new knowledge, but rather the collation of the pockets of knowledge from across the organisation to develop a shared understanding of the full legislative challenge.

6.3 Phase 3 – Develop Objectives

The Targets and Objectives for improvement were identified by the KTP Associate in conjunction with the Facilities Manager and reviewed by the Senior Management Team. These were developed carefully in order to be challenging and meaningful reductions, both in terms of environmental benefit and in terms of significance to stakeholders, but also to be achievable. The appropriateness of the targets was recognised as being of vital importance given that the results would be publicly reported.

Energy consumption was a key focus of the Society since it was not only a source of environmental impact but also a significant operational cost: in 2011 for example, energy and water costs accounted for £225k per year, exceeded only by Wages & Salaries £502k, Depreciation £262k and Repairs and Maintenance £240k. It was decided that a 5% reduction on utilities such as gas, electricity and water over a four year period would be an appreciable and achievable reduction in operational costs, whilst also representing a worthwhile environmental impact. Waste recycling was also identified as an area for improvement on the basis of its environmental impact: 45 million tonnes of waste is produced by businesses in England alone each year (DEFRA, 2012).

Once the Targets and Objectives were set, the Environmental Management Programme was created to realise these Targets. Within this programme, a series of projects each aimed to achieve one or more of the targets.

6.4 Phase 4 – Development and Implementation of the EMS

While generating the management procedures and some of the documentary requirements were found to be highly complex and onerous for this size and type of organisation. In particular, the requirements for training stipulated separate documents for needs assessments, training reviews and personnel records. It was decided that a single multi-purpose document

would be created to cover the requirements. Upon examination by the EMAS auditor this was found to be sufficient. Adhering vehemently to the regulation can result in the loss of creative endeavour to improve environmental performance (Honkasalo, 1998). Therefore training document requirements were satisfactorily met by a new single multi-purpose document.

The complex requirements and implications of EMAS and the difficulty that many of the implementation team had in trying to understand them continued to be an issue. Ultimately, many actions could be implemented without the member of staff having a detailed understanding of the relevant legislation: for example, arranging for oil stores to be bunded did not require the person with direct responsibility to gain a detailed knowledge of the Control of Pollution (Oil Storage) (England) Regulations 2001. It was sufficient that the need to undertake the improvement had been identified by the implementation team and a competent contractor with an understanding of the relevant regulations could be enlisted to undertake the work. The project thus became focussed on describing 'Actions' rather than providing an explanation of the background 'Requirements'. This approach overcame the problem of providing extensive training to all staff when overcoming issues. Consequently this 'worker led and expert guided' approach speeded up the project work, reduced cost, whilst also removing some new staff members' anxiety about their lack of awareness of the regulations in comparison with more experienced team members.

The importance of the project was communicated to all employees by publishing the implementation team's project GANTT chart online, complete with task details and the name of the responsible team member. Tasks that were completed on schedule were highlighted with a 'happy face' graphic, whereas tasks that were behind schedule were highlighted with a 'sad face' graphic. This was a useful motivator for the members of the implementation team and was a simple way for other employees to understand how the project was progressing.

Employees effectively became project supervisors and thereby became closely interested and involved in the project and its successful and timely completion.

6.5 Phase 5 – Check, Audit and Review

The issue of the sustainability of EMAS became increasingly important: how would the momentum and good practices be maintained? The implementation team comprised people from most departments. This helped to ensure that an understanding of the systems was spread throughout the organisation. However, maintaining the network of actors and ensuring that the environmental management philosophy was reinforced over time required coordination. The use of mass email and environmental internet portal was used extensively and assisted in keeping staff abreast of developments and highlighting awareness of new procedures. The information contained within the portal made a valuable contribution, acting as the aggregation point for information which had been suitably formatted for consumption by non-experts. This was then used in the organisation's annual public disclosure of environmental performance, a requirement of EMAS.

The primary effort in this phase was to establish an internal audit programme. This required a schedule of processes and activities to audit and the collation of checklists for each audit. Checklists were time-consuming to produce and had to balance the need to capture relevant process details and metrics, while also avoiding being time consuming to use.

Identifying persons that were suitable to carry out the internal audits was particularly challenging given the general lack of employees' exposure to modern, formal management systems (see section Phase 1).

After reviewing the available human resources, the Senior Management Team selected the Financial Assistant as the most suitable candidate to take responsibility for conducting the audits in addition to her daily duties. She held responsibility for Catering provision at RB&W

and had prior experience of undertaking health and safety inspections of mobile catering units.

The next requirement was to establish protocols for handling non-conformance. An Environmental Incident Register was setup to capture all environmental incidents, internal and external audit and system non-conformances. A traffic light system was applied: Red indicating high severity, Amber indicating Concern or Near Miss, and Green indicating Early Warning / Minor potential for Non-Conformance. The External Auditor commented that this was a unique and new format for managing non-conformances.

The final element of this phase involved the development of a Management Review to ensure that the environmental management system was still fit for purpose. An annual Senior Management Team review was introduced. This event evaluates the performance against targets, the corrective and preventive actions undertaken and identifies areas for improvement in the management system itself.

6.6 Phase 6 - Certification

Phase 6 of the Acorn scheme is the point at which organisations pursue ISO14001 or EMAS certification. Essentially, Phases 1 to 5 have prepared the organisation to achieve ISO14001. Stage 1 of Phase 6 involves auditing the internal management systems that can result in the formal award of ISO14001. Stages 2 to 6 involve the development and audit of information for public disclosure. There was little additional cost involved in gaining ISO14001 while the accrediting body was auditing the organisation for the award of EMAS. The company therefore achieved both ISO14001 and EMAS.

7.0 Discussion of Benefits and Challenges

7.1 Benefits

The original target to achieve a 5% reduction in energy and water costs was achieved after a number of initiatives were undertaken over the four year period (Shown in Table 1). These figures are subject to seasonal fluctuation, however, the magnitude of improvements are considerably larger than the observed variations in business activity. The savings totalled £215,000 over the full four year period. This is significant as there were unit price increases of fixed utilities over the period: Gas +2.2%; Electricity +25.5%; Water +13.5%; and sewerage +11.4%.

A key reason for pursuing EMAS was its perceived marketable value to the organisation. Measurable evidence of the impact of the work was a total reduction in the organisation's carbon footprint of 30.26 tCO₂e per annum, shown in Table 1. It is difficult to estimate a financial figure for this benefit both purely through the difficulty of calculation and also because of business confidentiality reasons. However, a significant contract was gained which was of considerable financial benefit to the organisation as a direct consequence of RB&W being able to materially demonstrate its commitment to environmental concerns.

It is also difficult to quantify some of the cost benefits for EMAS implementation that relate to fines that could have been incurred had improvements not been made. It is possible to provide financial justification for the costs of compliance with regulations since these can be conceived as preventive expenditure. For example, the cost to upgrade the bunding at an oil store was £2000. However, the potential cost of not performing this work could equate to £5000 upon summary conviction and even rising to an unlimited fine should a conviction on indictment be made. The scale of these costs of compliance will obviously depend upon the nature of the work that the organisation is undertaking. However, the argument for offsetting these against the potential costs in the form of statutory fines, civil sanctions and restoration

notices (<http://www.legislation.gov.uk/ukxi/2010/1157/contents/made>) that could be incurred, plus the negative impact that non-conformance would have upon environmental stakeholders and public perception of the organisation is relevant.

The financial benefits of undertaking the journey toward EMAS is of concern to the organisation but the 'Expenditure' to achieve the 'Operational Benefits', shown in Table 1, could be communicated in the annual EMAS disclosure in terms of its environmental benefits. The environmental consequence of these improvements may be expressed as a reduction in the volume or units of gas and electricity consumed, or as shown in Table 1, in terms of the reduction in the organisation's carbon footprint (tCO₂e per annum). This form of disclosure is likely to be of greater interest to environmental stakeholders, particularly public stakeholders, and thereby be more likely to have a positive marketable value.

7.2 Challenges

Section 4.2 identified the potential challenges to EMAS implementation that include the disclosure of sensitive information, costs and establishing meaningful measures of performance.

7.2.1 Information

This investigation did not discover a reluctance to disclose information and neither did it identify any environmental performance or incident information that may have been economically damaging to the organization. The finding may be unsurprising given the nature of the organisation's work, and raises a question whether the nature of a particular business sector will therefore tend to promote information-retention or result in a general disinclination to adopt EMAS.

7.2.2 Costs

The most significant project expenditure was the manpower cost of the implementation team.

The KTP activity is a known cost; £130,000 for the first full KTP, followed by the second short KTP (sKTP) of £12,000. Due to the structure of the KTP scheme this cost was borne by both the Technology Strategy Board (65%) and RB&W (35%).

The cost relating to RB&W staff are more difficult to capture. Since this activity was not captured explicitly as a separate activity in timesheets, effectively being carried out as part of normal duties, it is difficult to calculate an incurred cost. It was estimated that 700 hrs work was undertaken by RB&W staff. Based upon an average cost of £15 per hour, this equates to £10,500.

The total cost for EMAS implementation is calculated to be £345,000: comprising £242,600 (investment in improvements) + £84,500 (full KTP) + £7,800 (short KTP) + £10,500 (staff cost). We therefore find that the cost of implementing EMAS is 60% higher than the cost benefits that were realised over four years (£345,400 compared to £215,000). These costs do not include the annual cost of operating the management system, estimated at £12,000 for the continued part-time employment of the KTP Associate. However, the on-going cost analysis should also recognise the additional revenue gained from the award of new business and the continued benefit of reductions in gas, electric and water costs. Furthermore, gaining EMAS certification has paved the way, through the development of a formal environmental management system, practices and awareness, for the organisation to make significant long-term investments that have appreciable financial and environmental returns. These include £140,000 for solar photovoltaic systems that will return in excess of £10,000 per annum over their 25 year lifespan and a reduction of 27.3 tCO₂e per annum, and £70,000 for a wind turbine that will return in excess of £11,000 per annum over its 20 year lifespan and a reduction of 20.2 tCO₂e per annum.

[Insert Table 1 Here]

7.2.3 Measures of Performance

The setting of goals and targets was made at the discretion of the company. This organisation was the first to gain formal accreditation of its EMS and there was a consequent lack of available performance data within this sector upon which to base targets. It would have been entirely possible to set low targets in order to make them easier to achieve. However, setting and achieving higher targets served to gain customer approval and resulted in commercial advantage.

The targets were eventually developed to reduce gas, electricity and water consumption. Not only was this identified as a pertinent environmental issue but also these were significant operational costs for the organisation. Adopting these targets meant that they were both meaningful to the organisation, which aided in maintaining management conviction and employee interest, and would result in valuable improvements to the organisation's environmental impact.

8.0 Conclusions

This research improves our knowledge of the adoption of environmental management systems. It also provides further insight into the highly heterogeneous sector of non-profit SMEs. This investigation of a non-profit organisation in the Southwest of the UK reveals the costs, benefits and challenges associated with EMAS implementation.

The study confirms that the costs associated with EMAS implementation are significant both in terms of investment in technology and in the demand made of human resources (Hillary, 2004). In this case, the cost of implementation is significantly greater than the benefits realised over the first four years. However, the reduction in environmental impact, in terms of the organisation's carbon footprint, is important.

The study also concurs with the literature in finding that the benefits of EMAS are not limited to environmental improvement (Hillary, 2004; Strachan, Haque and McCulloch, 1997).

Gaining EMAS has enabled the organisation to make significant long-term investments in renewable energy technologies that have appreciable financial and environmental returns.

The study also finds that EMAS had marketable value and resulted in additional business (Hillary, 2004; Strachan, 1995). Contrastingly, the detailed site audits that are required for EMAS implementation also identified information (Goodall, 1995) and practices (Hillary, 2004) that were potentially harmful to the business.

While there is an on-going cost of operating and developing the management system this is minimal when compared to the potential future benefits of implementing EMAS if the measures and targets for improvement are challenging but continue to be meaningful and achievable. This study was made upon a non-profit, rural organisation. It is likely that organisations that employ greater levels of technology and have a more deleterious effect upon the environment would realise greater returns upon their investment in terms of reductions in environmental impact.

The Acorn 6-step scheme appears a practicable approach to achieving ISO14001 or EMAS certification. However, some of the supporting documentation is inconsistently worded and some sections are more fully detailed than others. To improve the clarity of the framework and assist companies in their successful pursuit of ISO14001 and EMAS, and thereby potentially improve the uptake of these environmental management systems, the supporting documentation requires enhancement.

The UK Government funded KTPs offer SMEs a cost-effective approach to undertaking the implementation of an environmental management system. Government funding reduces the financial burden of undertaking the significant amount of work required to meet the requirements of an EMS and the employment of the KTP Associate was a valuable addition

to human resources. Additionally, partnering with a university provided access to knowledge that may be otherwise difficult or costly for SMEs to acquire.

Future research should explore the implementation of EMAS in other sectors of commerce. It should aim to confirm the relationship between the costs and benefits that EMAS can present to an organisation. Furthermore, it should seek to identify the effect that the potential disclosure of sensitive or incriminating information and practices may have upon the uptake of EMAS.

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Stage 6 EMS acknowledgement under EMAS	Stage 6 EMS acknowledgement under ISO14001
Stage 5 Checking audit and management review	
Stage 4 Implementation and operation of the EMS	
Stage 3 Developing objectives, targets and programmes	
Stage 2 Identifying and ensuring compliance with legal and other requirements	
Stage 1 Commitment and establishing the baseline	

Figure 1:
adapted
from

IEMA (2012a)

Phase 7 Initiation of Continual Improvement
Phase 6 Training, Awareness and the Initiation of Culture Change
Phase 5 Developing an Initial EMS Implementation Plan
Phase 4 Developing Environmental Indicators
Phase 3 Developing a Draft Environmental Policy
Phase 2 Baseline Assessment
Phase 1 Gaining and Maintaining Management Commitment

Figure 2: adapted from 'The BS8555 SME Workbook' (IEMA, 2012b)

Table 1, Investment in Improvements and Realised Benefits

	Expenditure	Operational Benefits	Environmental Improvement (per annum)
Gas	£225,000 Biomass Boiler	24%	15.01 tCO ₂ e
Electricity	£1400 Motion Sensors £1200 Skylights	4%	12.50 tCO ₂ e
Water	Waterless Urinals	30%	2.19 tCO ₂ e
Sewerage	£15,000 Drainage Improvements	4%	0.56 tCO ₂ e
Recyclable waste	Internal costs to source new waste contractor	20%	58% of waste recycled