



## Waste minimisation at a Welsh university: A viability study using choice modelling

B.K. Harris, E.J. Probert\*

School of Business and Economics, Swansea University, Swansea SA2 8PP, United Kingdom

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### ABSTRACT

The Welsh Assembly Government has a commitment to a Wales-wide strategy for action on education for sustainable development and global citizenship. The strategy calls for Higher Education Institutions in Wales not only to incorporate sustainability into teaching and research activities, but also to put these principles into practice by minimising their overall resource use to sustainable levels. In this context, the study reported here considers opportunities for waste minimisation within Swansea University, in Wales. Research focuses on the viability of reducing waste from disposable drinks containers through the promotion of a refillable cup scheme. A choice experiment is employed to determine staff and student preferences, and a positive response towards the use of reusable cups is evident. Knowledge is gained as to the central influence of financial incentive on the uptake of this environmental action. Results indicate that a waste minimisation scheme in the form of a refillable cup campaign at Swansea University is indeed viable, and has every potential of proving successful if implemented under the recommendations of this study.

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### 1. Introduction: sustainability drivers for Higher Education Institutions in Wales

There are over 2 million students and approximately 345,000 employees in Higher Education Institutions (HEIs) in the UK (Higher Education Statistics Agency, 2008), and the higher education sector is set to be influential in the drive towards sustainability. This is because of the numbers of participants that are involved in the sector, the influence it has over society in terms of global academic research, communities and learning, as well as impacting the behaviour, attitudes, and knowledge of future influential generations.

A plethora of international agreements and legislation are driving sustainable practices. Many of these have impacts on UK Higher Education Institutions through compliant UK law, and significant management implications relating to the reduction of environmental and social risks. Calls for action specifically within the Higher Education sector have come from a variety of voices, over a period of years. The Talloires Declaration, composed in 1990, and now signed by more than 300 university presidents and chancellors around the world urged universities to strive to help address environmental problems. In the UK, the Toyne Report (Department for Education, 1993) and the UK government response (Department for Education and Employment, 1996) both recommended an environmental responsibility agenda for higher education.

The UK consists of four constituent countries: England, Wales, Scotland and Northern Ireland. A devolved form of government has been introduced for Northern Ireland, Scotland and Wales, which has transferred an array of powers and responsibilities away from the central government in London to each of these constituent countries. This study is based in Wales, where devolution has involved the setting up of an elected regional assembly, the Welsh Assembly Government. At a national level, the Welsh Assembly Government has a duty to deliver sustainable development under the Government of Wales Act, and the Assembly has produced a Sustainable Development Scheme and Action Plan on which it must report progress annually (Welsh Assembly Government, 2007). One of the top 10 commitments within this plan has direct implications for Higher Education Institutions in Wales: there is a commitment to a Wales-wide strategy for education for sustainable development and global citizenship (ESDGC). The ESDGC commitment identifies a set of key levers for change to encourage sustainable practices. Institutions should identify a lead 'Champion' for ESDGC with responsibility for taking the agenda forward, and they should incorporate sustainability into their teaching and research activities. However, were Welsh institutions just to teach and research sustainability, they could be accused of hypocrisy; the Welsh Assembly Government also considers it is imperative that sustainability is practiced (Welsh Assembly Government, 2006).

Consequently Welsh HEIs are being encouraged to develop environmental management systems and measures which cover all their operations in order to minimise their overall resource use to sustainable levels. Encouragement is not only in the form of political influence, but also in the form of financial influence. Welsh universi-

\* Corresponding author. Tel.: +44 1792 295182; fax: +44 1792 295626.  
E-mail address: [j.probert@swansea.ac.uk](mailto:j.probert@swansea.ac.uk) (E.J. Probert).

ties receive the majority of their funding from the Higher Education Funding Council for Wales (HEFCW). In 2006/7 there were nearly 132,000 students in higher education in Wales, and HEFCW supplied the HEIs with funding of approximately £400 million to support their teaching and research activities. The majority of this funding is distributed through block grants to the institutions, allocated by formulae which take account of various factors including recruitment in academic subject categories and the amount of high quality research undertaken. HEFCW is working with the ESDGC Champions in Welsh HEIs to deliver their sustainability priorities, and is providing support and guidance to enable the HEIs to make progress. Thus, in Wales in particular, there is policy driving sustainable development in higher education, and support to provide a platform on which this sustainability can be initiated. Welsh universities should respond by implementing a variety of sustainability projects. This study sets out to describe the viability of one such project in Swansea, a city in the south west of Wales.

## 2. Context of the study

Swansea University, located in South Wales in the UK, was the site of this study. Swansea University is the second largest HEI in Wales, with approximately 14,000 students and over 2000 members of staff. It is a single campus site of mid-size scale compared with other UK HEIs, offering the researchers ease of study as well as avoiding potential bias from any extremity in size. Swansea University is developing its sustainability policy and practice. The 'Green League 2007' compiled by the student organisation People and Planet has, for the first time, collected and ranked environmental information on UK universities (People and Planet, 2007). Table 1 reproduces a selection of the Green League 2007 rankings; it shows the universities in first, second and third positions, together with the rankings of the Welsh HEIs. Swansea University's environmental performance was ranked 46th out of 105 universities in the UK, and 4th out of the Welsh HEIs—showing evidence of commitment to environmental matters, but major improvement required. This ranking is being addressed by the university through a number of measures including the instigation of an environmental management system, which provides the roots for this study.

### 2.1. Focus of the study: waste minimisation

Universities impact the environment through the resources they use and the emissions and waste they produce. According to a study in the UK higher education sector, each HEI produces on average over 900 tonnes per year of material waste (Waste Watch, 2005), and thus waste management is a significant factor to address within the higher education context. Decisions on waste management strategy and the design of waste management systems should

**Table 1**  
A selection of UK universities and the Green League 2007 ranking of their environmental performance produced by the student network People and Planet.

Rank	University
1	Leeds Metropolitan
2	Plymouth
3	Hertfordshire
4	Glamorgan
22	Newport, University of Wales
27	Swansea Institute, University of Wales
46	Swansea
60	Bangor
71	University of Wales Institute Cardiff
82	Cardiff
97	Aberystwyth
97	Lampeter, University of Wales

Source: <http://peopleandplanet.org>.

be informed by the concept of the waste hierarchy (Department for Environment, Food and Rural Affairs, 2007). Wales has its own National Waste Strategy (Welsh Assembly Government, 2002) which also supports the idea of the waste hierarchy. This confirms that the best way to manage waste is simply not to generate it in the first place. Despite this, the emphasis of waste management activities on campuses is often on recycling initiatives, whereas opportunities for source reduction may be overlooked.

In a university setting, staff and students have a role to play in source reduction to prevent waste entering the waste stream, and their behaviour is vital to the success of any project which seeks to minimise waste (Tudor et al., 2007; Fahy and Davies, 2007). Studies have shown that waste minimisation behaviour is influenced by a concern for the environment and community, and is likely to be prevented by perceptions of inconvenience and lack of time, and significantly correlated with perceived control, situational factors and incentive (Tonglet et al., 2004; Barr, 2004). Literature suggests that in order to stimulate waste minimisation a new approach to designing projects is needed; there needs to be less reliance upon intention and more attention on what actually drives behaviour (Barr, 2004). The study described here tries to address those issues. It investigates the viability of a waste minimisation project on campus, and discusses how university staff and students could be encouraged to take part in the initiative.

### 2.2. Aim of the study

At Swansea University, baseline data has confirmed that one of the main environmental aspects is waste production and management. Two main waste streams with potential for reduction are: paper and catering packaging. The waste paper stream is under long-term assessment and targeting. Catering packaging has not been similarly targeted, although it is a major component of the university's waste. Thus the basis of this study is to assess the viability of drinks packaging minimisation at Swansea University, and to determine the factors which would encourage participation in such a scheme.

At the start of the study weekly sales included drinks supplied in approximately 3600 plastic bottles, 10,000 paper cups and 10,000 plastic cups. Significant quantities of glass bottles are also used to supply drinks in the Student Union bars. A waste minimisation campaign might attempt to reduce the use of such single use bottles and replace them with reusable glasses. However, this is not possible as the use of bottles is encouraged by the Students' Union due to the social issues associated with drink 'spiking' in bars and clubs.

From the baseline data it is apparent that 20,000 disposable paper and plastic cups used on campus per week provide the majority of the waste produced from drinks containers, perhaps influenced by society's 'to go' culture. Best practice from other HEIs shows that the main possibility for waste minimisation of such drinks containers is the use of refillable cups or mugs. Promotion of such use is often found in the form of a 'lug-a-mug' campaign, whereby users are encouraged to utilise a reusable mug rather than a disposable cup. Such schemes have proved successful in many North American universities, but very few have been implemented in UK universities. Hence this study set out to assess the viability of a waste minimisation scheme in the form of a reusable mug campaign at Swansea University.

## 3. Methodology

Data collection was achieved from both primary and secondary sources to provide broad and specific insight and benefits of current knowledge and practice, as well as up-to-date, contextual data specific to the scope and purpose of this research. A desk study was

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