

Carbon and Energy Issues Affecting Higher Education - Current Regulations and Schemes

Version 2.1, Updated January 2011

Incorporating amendments to Sections 1, 2.1, 3.1, 3.2, 4.1 and Table 2
(Comments welcome – please contact [l.m.hopkinson\(at\)bradford.ac.uk](mailto:l.m.hopkinson@bradford.ac.uk))

Peter James and Lisa Hopkinson

**Higher Education Environmental Performance Improvement Project,
University of Bradford**



Contents

Partners, About HEEPI, Acknowledgements and Disclaimer	3
Glossary of Acronyms	4
Introduction	5
Section 1 - Background	6
Figure 1: Key Requirements Relevant to Energy Consumption and Carbon Emissions	8
Table 1: Statutory/Mandatory Requirements Relevant to Energy and Carbon Issues	9
Table 2: Non-statutory/optional Schemes Relevant to Energy, Carbon and Environmental Issues.....	10
Section 2 – Statutory or Mandatory Requirements on Energy and Carbon	11
2.1 Building Regulations - Part L	12
2.2 Building Energy Certificates - DEC's and EPCs	13
2.3 Inspection of Cooling Systems	15
2.4 EU Emission Trading Scheme	15
2.5 CRC Energy Efficiency Scheme (Carbon Reduction Commitment)	16
2.6 Renewable Energy/Low Carbon Requirements.....	18
2.7 Funding Body Requirements and Guidance	19
Section 3 – Non-statutory/Optional Schemes on Energy and Carbon	21
3.1 BREEAM.....	21
3.2 Government Buying Standards and other Procurement Initiatives.....	22
3.3 Universities that Count.....	24
3.4 Green League	25
Table 3: 2010 Green League Criteria and Scoring	26
3.5 Carbon Trust Programmes	26
3.6 ISO14001 and Related Standards	27
3.7 EcoCampus	28
3.8 Green Impact Universities	29
3.9 The Universities and Colleges Climate Commitment for Scotland (UCCCFs)	30
4. Financial Opportunities	31
4.1 Zero and Low Carbon (ZLC) Technologies	31
4.2 Salix Finance	31
Section 5 - Analysis	33
Figure 2: A Strategic Process for Energy and Environmental Issues.....	34

Partners, About HEEPI, Acknowledgements and Disclaimer

Partners

This guide has been produced by the University of Bradford based HEEPI project (see below), in collaboration with the Association of University Directors of Estates (AUDE). The updating for this second edition has been made possible by HEEPI's funding for green IT work by the Joint Information Systems Committee (JISC). A separate version of the document is being produced for the IT community.

About HEEPI

The *Higher Education Environmental Performance Improvement* (HEEPI) project supports sustainable development, and especially environmental improvement, in universities and colleges through: identification and dissemination of best practice; creation and maintenance of networks; development of benchmarking data and processes; and in other ways. It is based at the University of Bradford, and has mainly been funded by the Leadership, Governance and Management (LGM) initiative of the Higher Education Funding Council for England (HEFCE). Since its inception, HEEPI has run almost 100 events, with over 4,000 delegates; prepared many case studies, guidance documents, and tools (see www.goodcampus.org). Its main projects at present are S-Lab (Safe, Successful and Sustainable Laboratories) and SustelT (focused on energy efficient ICT).

About the Authors

Peter James is (part-time) Professor of Environmental Management at the University of Bradford, and co-director of HEEPI. His recent work includes the SustelT review of sustainable ICT in further and higher education for JISC; a review of innovation in environmental services for BERR and DIUS; co-founding the Centre for Sustainable Engineering; co-ordinating the EU Sustel (Sustainable Teleworking) project; and membership of the EU's Expert Groups on Environmental Technology, and ICT and Energy Efficiency. His publications include *Driving Eco-Innovation*, *The Green Bottom Line*, and *Sustainable Measures*.

Lisa Hopkinson is currently a researcher with HEEPI at the University of Bradford, and is working on the S-Lab and SustelT projects. Her previous experience includes environmental consultancy in the UK and Hong Kong, campaigns coordinator for Friends of the Earth (Hong Kong) and co-founder and Head of Research for a non profit public policy think tank, Civic Exchange, in Hong Kong.

Acknowledgements

The authors wish to thank the following for advice and information on this report: Ian Barham, Defra; Charlotte Bonner, NUS Services Ltd; Alan Brookes, The Energy Consortium (TEC); Steve Butcher, HEFCE; Andrew Chamberlain, EAUC Scotland; Chris Cowburn, HEFCW; Oliver Fry, Salix Finance; Janine Hamilton, Sustainable Procurement Centre of Excellence (SPCE); Louise Hazan, People & Planet; Sarah Lee, EAUC; Alex Mcfarlane, Association of University Procurement Officers (AUPO); Gerald McInerney, Communities and Local Government (CLG); Richard Meddings, EcoCampus; Alison Meldrum, Scottish Funding Council; Iain Patton, EAUC; Tim Pryce, Carbon Trust; Joanna Simpson, HEFCE; David Stutchfield, University of St Andrews; Paul Smyth, Salix Finance; Martin Whiteland, University of Cambridge.

Disclaimer

Every effort has been made to ensure that the information in this document is accurate. However, it should not be used as a substitute for professional advice on detailed matters of regulation, or its implications.

Glossary of Acronyms

AUPO:	Association of University Procurement Officers	EU:	European Union
BiTC:	Business in the Community	HE:	Higher Education
BREEAM:	Building Research Establishment Environmental Assessment Method	HEFCE:	Higher Education Funding Council for England
CCC:	Committee on Climate Change	HEFCW:	Higher Education Funding Council for Wales
CCL:	Climate Change Levy	ISO:	International Standards Organisation
CIF:	Capital Investment Framework	LZC:	Low and zero carbon
CLG:	Communities and Local Government	MW:	MegaWatt
CO ₂ :	Carbon dioxide	NCM:	National Calculation Methodology
CR:	Corporate Responsibility	NMO:	National Measurement Office
CRC:	Carbon Reduction Commitment	NUS:	National Union of Students
DEC:	Display Energy Certificate	ROC:	Renewable Obligation Certificate
DECC:	Department for Energy & Climate Change	SAP:	Standard Assessment Procedure
DEFRA:	Department for Environment, Food & Rural Affairs	SBEM:	Simplified Building Energy Model
EAUC:	The Environmental Association for Universities and Colleges	SFC:	Scottish Funding Council
EMS:	Environmental Management System or Estate Management Statistics	SPCE:	Sustainable Procurement Centre of Excellence
EPC:	Environmental Performance Certificate	UCCCFS:	University and Colleges Climate Change Commitment for Scotland
ESR:	Environment and Social Responsibility	UTC:	Universities that Count
ETS:	Emission Trading Scheme		

Introduction

Higher education (HE) is currently dealing with a plethora of initiatives intended to reduce energy usage, carbon emissions, and other environmental impacts in universities and colleges (summarised in Tables 1-2 and Figure 1). This is creating difficulties because:

- Most require a commitment of time and/or financial resource;
- The sheer number makes it difficult to understand their requirements, and how they relate to each other; and
- These and other factors mean that they can sometimes be diverting attention from, rather than encouraging, real environmental improvement.

This paper aims to assist senior managers within the sector – and especially Directors of Estates – in making sense of the current situation, and by suggesting ways in which it can be addressed for maximum environmental benefit. It is structured as follows:

- Section 1 provides a brief explanation of the general pressures which are driving the initiatives being discussed;
- Section 2 summarises the main statutory or compulsory requirements affecting universities and colleges on energy and carbon which are currently in existence, or scheduled for introduction in the near future;
- Section 3 summarises the main non-statutory or optional measures affecting universities and colleges on energy and carbon which are currently in existence, or scheduled for introduction in the near future
- Section 4 describes the main opportunities for funding energy efficiency and carbon reduction projects which are currently in existence, or scheduled for introduction in the near future; and
- Section 5 provides the authors' personal vision of a sensible way forward for individual institutions, and the sector as a whole.

Section I - Background

In 2008/09 universities and colleges were responsible for the following resource use and environmental impacts¹:

- Consumption of 7.7 TWh of energy (all fuels);
- Emissions of 2.6 million tonnes of carbon dioxide (CO₂) equivalent; and
- Creation of nearly 347,000 tonnes of waste, of which 57% was ultimately disposed of.

In addition, the sector's buildings and equipment contain large amounts of 'embedded' or 'embodied' energy and carbon, i.e. the energy consumed and CO₂ emitted in creation of the materials and components they contain, and any associated transportation. There are no precise figures for this, but its impact is considerable. For example, a 2004 Defra study suggested that each domestic house has 35 tonnes of CO₂ equivalent of embodied energy associated with it, which is around 8 times the annual occupational energy consumption.²

The supply and use of this energy has many environmental impacts, including:

- Ecological impacts, land take and sterilisation;
- Water consumption and pollution associated with production and distribution facilities;
- Air pollution associated with both production and distribution, and – in the case of fossil fuels – end use; and
- Emissions of CO₂ and other greenhouse gases, which are especially associated with the production, distribution and use of fossil fuels.

Fossil fuels are also a non-renewable resource and will be depleted at some point in the future.

Universities and colleges are under increasing pressure to reduce their energy consumption and carbon emissions as a result of:

- Rising energy prices – most experts expect costs, especially of electricity, to resume the increases of recent years once the credit crunch has ended;
- Challenging carbon reduction goals - the UK Government has ambitious targets to reduce greenhouse gas emissions by 80% by 2050 and at least 34% by 2020 against a 1990 baseline, and these are now cascading into a number of initiatives and regulations, such as the Carbon Reduction Commitment;
- Funding council requirements – the HE sector has developed carbon reduction targets in line with the 2050 80% reduction target and are linking capital funding to performance against carbon

¹ Estate Management Statistics, Environmental Information 2008/09. Available at: http://www.hesa.ac.uk/index.php/component/option,com_datatables/Itemid,121/task,show_category/catdex,4/

² Entec UK, Richard Hodkinson Consultancy and Economics for the Environment Consultancy. *Study into the Environmental Impacts of Increasing the Supply of Housing in the UK*. Final Report, April 2004. Study for the Department for Environment, Food and Rural Affairs (Defra). Available at: <https://statistics.defra.gov.uk/esg/reports/housing/mainrep.pdf>.

management plans. In addition HEFCW and the SFC require all new build to achieve an Excellent rating, and refurbishments Very Good, in the BREEAM scheme; and

- Stakeholder pressures – many staff and students pay attention to the environmental and social performance of institutions when making study or work choices, and other bodies such as local authorities also take it into account when making decisions.

As later pages demonstrate, there are now many different statutory and *de facto* mandatory requirements on institutions, as well as a number of voluntary initiatives. The reasons for this, often confusing, fragmentation include:

- Different public sector mandates and approaches (e.g. at national Government level four departments - Communities and Local Government; the Department of Energy and Climate Change; the Department for Environment Food and Rural Affairs; and the Department for Business, Innovation and Skills – are sponsoring different actions; the Funding Councils also have different approaches);
- Similar differences in mandates and approach – and occasional competition – between organisations assisting with implementation, e.g. Carbon Trust, Business in the Community;
- ‘Laissez faire’ methods of funding sector initiatives, so that individual institutions (or groups of them), and/or sector representative bodies, can relatively easily find funding for projects intended to influence the sector as a whole;
- Differing areas of focus – from individual items of equipment, through buildings, to campuses and whole institutions;
- Differing timescales; and
- Differing objectives.

Four basic objectives which can be identified are:

- Comparison – concerned with comparing the performance of buildings, campuses or organisations for purposes such as a) continuous improvement through benchmarking, or b) assisting stakeholder judgements of performance;
- Control – ensuring that specific performance levels or requirements are met;
- Incentivising – creating financial or other tangible rewards/penalties to drive improvements in performance; and
- Risk management – concerned with achieving a full understanding of environment-related issues and risks, and taking appropriate actions to ensure that the risks are controlled and mitigated.

As all of these factors seem likely to persist, there is always likely to be confusion, and sometimes conflict, between the many different approaches. Section 5 makes some suggestions on how this can be reduced. Before that, the following sections provide brief summaries of the main regulations and schemes which are relevant to the topic.

Figure 1: Key Requirements Relevant to Energy Consumption and Carbon Emissions

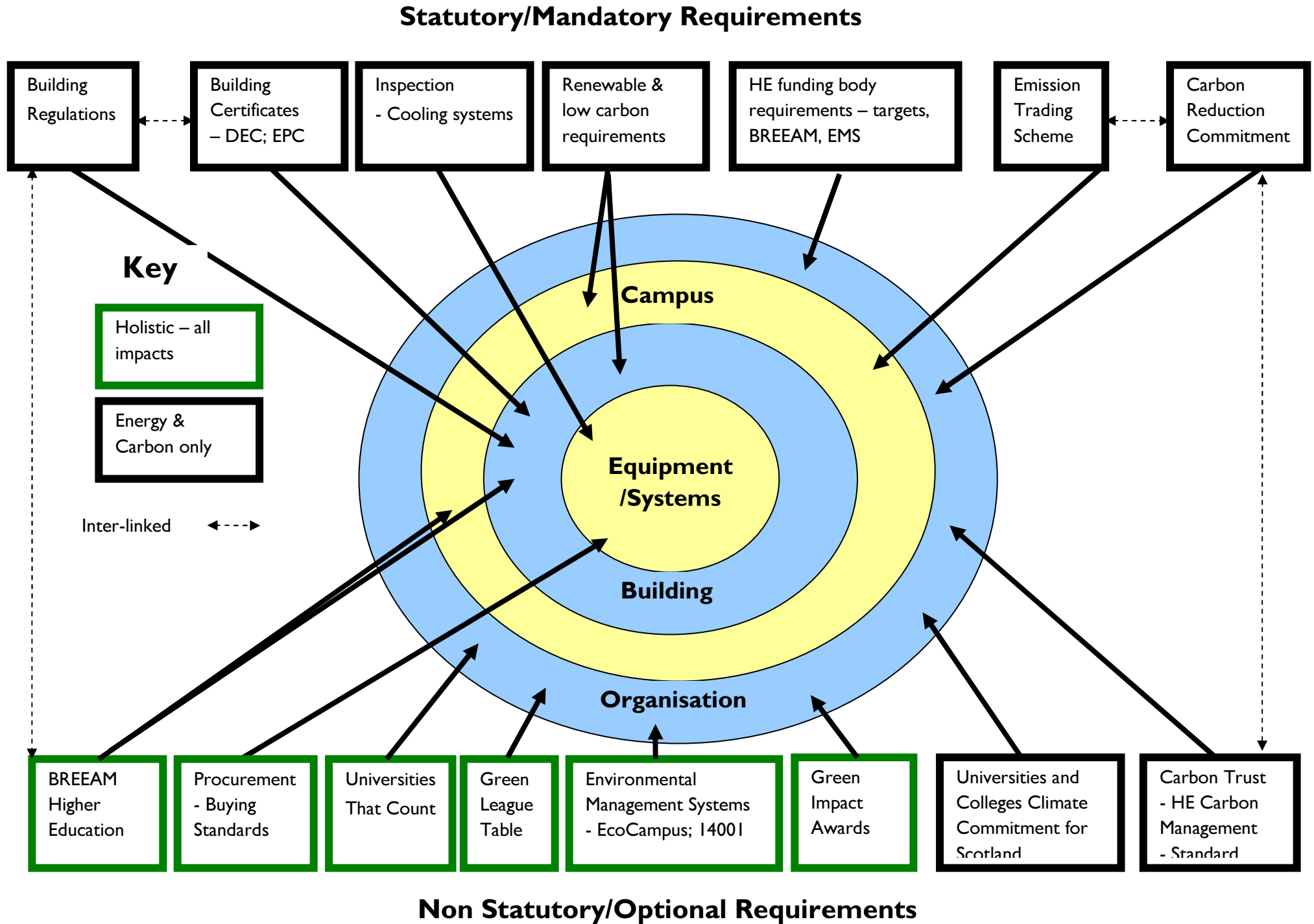


Table 1: Statutory/Mandatory Requirements Relevant to Energy and Carbon Issues

Legislation/Regulations	What's affected?	Key Requirements re Universities and Colleges
Building Regulations	All new build and retrofits	Requires minimum energy performance requirements in new buildings or retrofits. There are differences between England (where regulations were tightened in 2010) and Scotland.
Display Energy Certificates (DECs)	All existing buildings over 1,000m ²	Requires public display of a performance rating certificate detailing a building's CO ₂ emissions over the last 12 months, and ranking it on an A-G scale (England and Wales only).
Energy Performance Certificates (EPCs)	All new build; substantial retrofits; building sales or rentals	All new buildings or those that are substantially modified, sold or rented, to display EPCs detailing design CO ₂ emissions. (NB England uses a standard model – SBEM – to calculate; this can be used in Scotland, which requires EPCs for large public buildings, but so too can others).
Inspection of Cooling Systems	Cooling systems	Requires, in England, inspection (with improvement recommendations) of cooling installations (such as those in laboratories and data centres) every five years.
Carbon Reduction Commitment (CRC)	Organisations with annual half hourly metered electricity > 6000MWh/y	Requires monitoring and reporting of fossil fuel and electricity consumption, and participation in a scheme that ranks them in a league table. Organisations pay a 'tax' to Government (currently £12 per tonne) on their CO ₂ emissions.
Renewable/Low Carbon Energy Requirements	Energy supply	2008 Planning and Energy Act allows local councils in England and Wales to require a certain proportion of renewable energy in new developments.
Carbon Sector Targets	All activities generating greenhouse gases	HEFCE-funded institutions will be required to produce plans to reduce carbon emissions – performance against the plans will be a factor in future capital allocations.
SFC/HEFCW requirements	All new build or major refurbishment	New buildings must achieve BREEAM Excellent, and refurbishments Very Good, for both the Design and Procurement, and Post Construction stages.
HEFCW EMS Requirements	All activities creating environmental impacts	Institutions will be required to develop an Environmental Management System, externally certified to a recognised system, by early 2011.

Table 2: Non-statutory/optional Schemes Relevant to Energy, Carbon and Environmental Issues

Activity/Scheme	What's affected?	Number of HEIs (10/10)	Key Requirements re Universities and Colleges
BREEAM	New/refurbished buildings	Not available	A building certification system which assesses design against a number of criteria. Scoring undertaken by licensed Assessors. Since summer 2009 a HE version has lowered costs and provided known criteria from the start of the process.
Government Buying Standards	Wide range of energy using products, including ICT	Not applicable	These implement the EU Energy End Use Efficiency and Services Directive. Actions will be supported by the EU's Ecodesign Directive, which will mandate minimum performance requirements for many products, including ICT.
Universities that Count	Whole organisation	54	An index of an institution's corporate social responsibility (CSR) performance, enabling universities to benchmark themselves against each other and business.
Green League	All activities (including energy) creating environmental impacts	All	An annual ranking of Universities and Colleges based on (in 2010) 11 assessment areas covering both systemic environmental management, and actual performance. Utilises publicly available information as well as questionnaires.
Carbon Trust HE Carbon Management Programme	Whole organisation	114	A year-long 5 step process of calculating carbon footprints, identifying improvements, and formulating a carbon management plan.
Carbon Trust Standard	All energy using activities	39 +HEFCE	Requires organisations to measure their carbon footprint, achieve an absolute reduction in it, and demonstrate appropriate management and governance.
Environmental Management System (ISO 14001)	All activities (including energy) creating environmental impacts	Small number	An internationally recognised Environmental Management System based on 4 stages: plan, do, check and act. Organisations can use the standard as a guide or achieve formal certification after a compliance audit by an external assessor.
EcoCampus	All environmental impacts (including energy use)	36	Provides a support package to enable institutions to implement a robust and effective EMS through the provision of a variety of tools and guidance including software applications, training workshops, advice and external audit.
Green Impact Awards	All environmental impacts (including energy use)	37 (2010/2011)	An environmental accreditation scheme with an awards element – based on a bespoke set of simple, practical actions developed for the institution.
University and Colleges Climate Change Commitment for Scotland	All activities generating greenhouse gases	56	A voluntary scheme for Scotland's universities and colleges, requiring signatories to prepare and implement a 5-year Climate Change Action Plan.

Section 2 – Statutory or Mandatory Requirements on Energy and Carbon

Government environmental targets are implemented through legislation and detailed regulation, which are having a growing impact on the sector. Many of these are the UK implementation of European Union Directives, which often result in multiple UK initiatives. The Energy Performance of Buildings Directive, for example, has been implemented through three main routes in England and Wales:

- Revised Building Regulations;
- Requirements for energy consumption measurement (Display Energy Certificates and Energy Performance Certificates); and
- Stand alone measures, such as requirements for regular assessment of air conditioning systems.

The Directive has also been implemented differently in Scotland to England.

UK Government carbon targets will require much more legislation, regulation and other public initiatives in future. In addition to the current situation, several strategic initiatives are also likely to cascade down into specific legislation and regulation over the next few years. These include:

- The “Strategy for Sustainable Construction”, a joint industry and Government initiative, intended to provide clarity to business on the Government's position by bringing together diverse regulations and initiatives relating to sustainability.³ It will therefore provide a useful signpost for future regulation in some areas.
- The move to ‘zero carbon’ buildings. The Sustainability of the Government Estate (SOG E) initiative requires this for all UK Government buildings by 2012, and in England it is a requirement for all domestic buildings from 2016 and non-domestic buildings (probably) by 2019. The Welsh Assembly also expects all publicly funded new developments in Wales to be zero carbon from 2011. Until now, progress has been hampered by the absence of detailed definitions, but this is now being addressed.⁴

Future regulations are also likely to be more incentive-based than in the past. Such regulations do not compel improvement, but aim to create new drivers – including raised awareness, and concern about public perceptions – to encourage action by organisations.

There are also a number of mandatory requirements such as carbon targets and carbon management plans which all English universities are required to comply with.

Table I (above) summarises the main legislation and regulations, and the following pages provide further details.

³ The Department for Business, Innovation and Skills, 2008. The Strategy for Sustainable Construction. Available at : <http://www.berr.gov.uk/policies/business-sectors/construction/sustainable-construction/strategy-for-sustainable-construction>

⁴ CLG news Release. 17 July 2010. Grant Shapps outlines local approach to delivering zero carbon homes from 2016. Available at: <http://www.communities.gov.uk/newsstories/newsroom/16527871>

2.1 Building Regulations - Part L

What is it?

In England and Wales Part L of the 2010 Building Regulations⁵ deal with Conservation of Fuel and Power. They set minimum energy performance standards for new buildings and major refurbishments of existing buildings.

Successive revisions of the building regulations (in 2002, 2006 and 2010) have progressively reduced carbon emissions with an ambition for all new non-domestic buildings to become zero carbon by 2019 (the date for schools is 2016 followed by public buildings in 2018). The 2010 revision⁶, which came into force on 1 October 2010, is intended to reduce carbon emissions per m² by 25% over the 2006 Building Regulations, which is an overall improvement of 44% on the 2002 regulations. In 2006 the reduction was based partly on how the building was serviced but this has had some unintended consequences (e.g. it was easier to achieve a compliant air conditioned building than a naturally ventilated one). The 2010 amendments are based on the fact that it is more difficult to reduce the carbon emissions of some types of building than others. This means that some buildings will deliver more than 25% relative to 2006 standards, and some less. However, the aggregate target is 25%. Some analysis on how different types of non-domestic buildings might be affected by the aggregate approach can be found in the Implementation Impact Assessment.⁷

Part L 2010 majors on energy efficiency improvements and on-site Low and Zero Carbon (LZC) systems in a performance based way that tries not to stifle innovation or future allowable solutions. As well as introducing a timetable for zero carbon dwellings, the updated standards also introduce a proposed phased improvement for zero carbon non domestic buildings beginning with 25 per cent in 2010. The Government consulted on the further trajectory towards zero carbon new non-domestic buildings in late 2009 and more precision is likely in 2011.

The strengthening of the energy efficiency standards in Part L has been accompanied by two other changes:

- The move towards more airtight buildings has resulted in amendment of Part F of the Building Regulations to ensure that adequate means of ventilation is provided; and
- The National Calculation Methodology (NCM) of building carbon emissions, and the Simplified Building Energy Model (SBEM) which applies in the areas of Building Regulations and Energy performance Certificates (see Section 2.2), has been revised and updated.

A number of Approved Documents set out more details on the changes.⁸ These changes apply to England and Wales only. However, the UK Government is planning to transfer responsibility for Building Regulations in Wales to the Welsh Assembly on 1 January 2012.

In Scotland, the Building (Scotland) Amendment Regulations 2010 came into force on October 1, 2010.⁹ This has resulted in changes to mandatory standards and associated guidance, and the publication of new documents. The regulations are enforced by the Building Standards Division. The latest 2010 Technical

⁵ Available at: <http://www.communities.gov.uk/planningandbuilding/buildingregulations/>

⁶ Available at: <http://www.communities.gov.uk/publications/planningandbuilding/circular032010>

⁷ CLG, 2010. Implementation Stage Impact Assessment of Revisions to Parts F and L of the Building Regulations from 2010. March 2010. See Talbe 7, pp30. Available at: <http://www.communities.gov.uk/documents/planningandbuilding/pdf/1531558.pdf>

⁸ Available at:

<http://www.planningportal.gov.uk/england/professionals/buildingregs/technicalguidance/bcconsfppartl/bcconsfppartlappdoc/>

⁹ Available at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/tech2010changes>

Handbook for non-domestic buildings provides guidance on meeting the standards.¹⁰ Section 3 covers the environment (ventilation, combustion appliances and biomass fuel standards) while Section 6 covers energy. The standards specify minimum energy performance levels and require the calculation of carbon dioxide emissions using a specified National Calculation Methodology. This includes SBEM, as well as others. The technical guidance provides for a 30% improvement in CO₂ emissions for new buildings. Future amendments are planned in October 2013 and 2016/17.

The Scottish Government are also considering introducing sustainability labelling to provide recognition to buildings of higher standards than the current regulations require.¹¹ This will include more demanding sustainability standards based on two areas: (1) climate change, energy and water and (2) quality of life; material use and waste. It is proposed to have 5 levels of award: bronze, bronze star, silver, gold and platinum where gold is a 75% improvement and platinum a 100% improvement on the 2007 carbon dioxide emission standards for non domestic buildings. The award of an overall upper level depends on an integrated holistic design, which does not allow trade-offs to achieve a score.

Implications

The 2010 amendments will increase the costs of constructing new buildings in England and Wales, as developers will need to invest to a greater extent in energy efficient building fabric and services in order to comply with the lower limit on carbon emissions. In addition to the higher capital costs of constructing new buildings, developers may also incur additional testing and administrative costs. To balance this, the occupiers of properties built to the new standards should benefit from lower energy bills. Overall there should be a net saving.¹²

2.2 Building Energy Certificates - DEC's and EPC's

What is it?

The EU Energy Performance of Buildings Directive requires energy certification of buildings in England and Wales (see below for Scotland).¹³ This has been implemented by the 2007 Energy Performance of Buildings Regulations, which introduced:

- Energy Performance Certificates (EPC) – required whenever a domestic or non-domestic building is constructed, significantly modified, sold or rented. The exact form of the EPC varies according to the use and size of the building, but is always calculated from the design specification, using a slightly amended version of the SBEM methodology (in the case of non domestic buildings) required by Building Regulations. It is therefore termed an asset rating. EPCs are valid for 10 years, but must be renewed each time the building is rented, refurbished or sold. EPCs are produced by accredited Energy Assessors, and are accompanied by an advisory report on what could be done to improve energy performance.

¹⁰ Available at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/thb2010nondom>

¹¹ The Scottish Government, 2010. Consultation on Sustainability Labelling within Building Standards, 1 Nov 2010 – 24 Dec 2010. Available at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubconsult>

¹² Communities and Local Government, 2010. Implementation Stage Impact Assessment of Revisions to Parts F and L of the Building Regulations from 2010. April 2010. Available at: <http://www.communities.gov.uk/documents/planningandbuilding/pdf/1531558.pdf>

¹³ Communities and Local Government, 2008. Improving the energy efficiency of our homes and buildings: Energy certificates and air-conditioning inspections for buildings. Available at: <http://www.communities.gov.uk/publications/planningandbuilding/improvingenergyefficiency>

- Display Energy Certificates (DEC) – required for all higher education, and other, public sector buildings over 1,000m² in England and Wales. They contain data on the last 12 months of energy consumption, verified by an approved Energy Assessor (who can be an internal member of staff). The Assessor must also produce a short report on improvement opportunities. The data is used to classify the building on an A-G scale, based on comparison with a benchmark. This is termed an operational rating. The Certificate must be publicly displayed. For 2008-9 (the first year of operation) institutions could produce a single DEC for the whole campus. For 2009-10 these must be replaced by building specific advisory reports, and display a DEC for each building that meets the requirements.

New or refurbished higher education buildings over 1000 m² therefore require both certificates – an EPC when completed, and annual DEC's after the first year of operation.

The EU recast the Directive in November 2008 to extend its scope and strengthen it.¹⁴ The re-cast is expected to become domestic law at the end of 2012 or the beginning of 2013. Changes expected include:

- DEC's to be displayed in buildings larger than 250m² that are occupied by a public authority (likely, as in the past, to be defined in a way that includes universities and colleges);
- EPC's to be displayed in commercial buildings larger than 250m² that (a) are frequently visited by public and (b) where an EPC has previously been produced on the sale, rent or construction of that building;
- The energy performance of existing buildings of any size that undergoes major renovations to be upgraded in order to meet minimum energy performance requirements;
- Minimum energy performance requirements to be set in respect of technical building systems, e.g. boilers, air-conditioning units etc.;
- European Commission to establish common principles for definition of low and zero carbon (LZC) buildings; and a
- Requirement to set targets for increasing the number of LZC buildings in the following areas: new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities

In Scotland, the Energy Performance of Buildings (Scotland) Regulations 2008 came into effect in January 2009.¹⁵ Buildings when constructed, sold or rented out, including homes, public sector buildings and business premises will require an Energy Performance Certificate (EPC). For existing buildings, an EPC will be required when the property is sold or rented out to new tenants. Once in place an EPC is valid for 10 years.

Implications

Building certification is an example of incentive-based regulation. It has an especially great impact in higher education, by providing information for stakeholders to compare building performance, both within and between institutions. The Estates Management Statistics now require information on the amount of non residential area within each DEC category and it is likely that pressure groups or others will use it to produce a ranking of buildings, similar to People & Planet's Green League (see section 3.4). This effect will be exacerbated by the relatively poor ratings achieved by many higher education buildings, many of which

¹⁴ Communities and Local Government. Recast of the Energy Performance of Buildings Directive. October 2009. Available at: <http://www.communities.gov.uk/publications/planningandbuilding/recastepbdconsultation>

¹⁵ Guidance available at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubepc>

only have the worst (G) score. This is often explained by their unusually high energy intensity (e.g. in laboratories) but in nonetheless looks unimpressive to many observers.

Individual metering of almost all higher education buildings greater than 1,000m² will soon be required as part of DEC certification, and in the medium term this could be extended to buildings greater than 250 m². There will also be considerable expenditure on energy calculations for EPCs, and Energy Assessors for DEC. There may be opportunities to cut costs, and strengthen sector capacity, by creating more in-house expertise in these areas. There could also be benefit in collaboratively procuring assessor services to achieve best value, and to go beyond the basic report requirements. Indeed universities employing external consultants will probably gain more from extending the report requirement into a short energy survey – maximising the benefit of having a trained engineer in the building and applying their professional judgement to complement the software outputs. Until DEC is fully metering based and/or related to building specific benchmarks, rather than based on campus averages, research intensive universities will be at a disadvantage, as their relatively high number of energy intensive facilities will bring down the average level of building performance, compared to less research intensive institutions.

2.3 Inspection of Cooling Systems

What is it?

The 2007 Energy Performance in Buildings Regulations requires regular inspection of air-conditioning systems in buildings in England and Wales with a rated capacity over 250 kW from 4 January 2009, and over 12 kW from 4 January 2011.¹⁶ The inspection must be carried out at intervals not exceeding 5 years, and be conducted by an accredited energy assessor. The inspection covers not only the energy efficiency of the cooling equipment, but also whether the cooling capacity is appropriately sized for the load. Current requirements do not require action to be taken as a result of the inspection but, as with building certification, the aim is to stimulate improvement through better understanding. Another driver may be some or all reports entering the public domain, either because future revisions of the regulations require it, or because of Freedom of Information requests from external bodies.

Implications

The impact of this regulation will depend upon the depth of analysis by energy assessors. It could be a tick box exercise. However, if taken seriously, it could challenge existing practices, and result in more critical analysis of the need for cooling; a move towards much more variable systems which can better track loads; and greater take-up of other energy efficiency measures. This could be made more likely if universities commissioned a small enhancement of the advisory reports to incorporate related recommendations for controls and management of the chilling systems. If successful, it is also likely in the medium-long term that the approach will be extended to other equipment and activities, such as boilers or mechanical ventilation systems.

2.4 EU Emission Trading Scheme

What is it?

The EU-ETS is an example of incentive-based regulation. It involves the European Commission – in consultation with national governments – setting an annual ‘cap’ on permitted carbon dioxide emissions from all sites with an aggregated thermal input capacity of 20MW.¹⁷ A National Allocation Plan for each country then shares out the total permitted emissions between these sites, on an annual basis (e.g. 50,000

¹⁶ Communities and Local Government. Improving the energy efficiency of our buildings: A guide to air-conditioning inspections for buildings. July 2008. available at:

<http://www.communities.gov.uk/publications/planningandbuilding/airconditioning>

¹⁷ Guidance available at: <http://www.environment-agency.gov.uk/business/topics/pollution/32232.aspx>

tonnes of CO₂ emissions for a university). The sites must then report their annual emissions, with independent verification.

The scheme involves tradable allowances (each for one tonne of CO₂ emissions). If a university emits less than its permitted level over the year, it can either sell the surplus allowances on the EU-wide carbon market, or bank them for use in subsequent years. If it emits more than its allowance, it has to either purchase sufficient to cover the overrun, or pay a fine. The improvement impetus of the scheme is therefore related to the price of allowances. Unfortunately, although these have occasionally risen to €30/tonne, they have generally been lower than anticipated, and hit an all time low of €8/tonne in early 2009. This was due to excess supply arising from generous allocations in many countries, and the effects of the credit crunch in driving emissions down. The EU has said that it will take measures to drive prices up, but it remains to be seen if this will happen.

Phase I of the scheme ran from 2003-8, and involved around 40 universities. Phase II runs from 2008-2012, and – due to rule changes to exclude smaller organisations – now involves around 20. Further five-year phases are expected beyond this. They may also extend the scheme to cover other greenhouse gases, as well as CO₂.

According to one report, because the economic crisis has driven down industrial activity while the cap remains at the same level the estimated carbon savings for 2008-12 could be less than 1% of total emissions.¹⁸ It is proposed there will be a tighter cap for 2013 onwards.

Implications

For those universities that are part of the ETS there are significant administrative costs, and for those that exceed their allowances there are also the costs of buying additional carbon credits. However the scheme can, in theory, financially benefit universities who have taken early action on reducing carbon emissions (and can therefore sell surplus credits), and provide financial incentives to those who are lagging. In practice, the low price of carbon has reduced the importance of the ETS as a driver of energy efficiency (except with regard to large scale CHP Investments).

2.5 CRC Energy Efficiency Scheme (Carbon Reduction Commitment)

What is it?

The CRC Energy Efficiency Scheme (previously known as the Carbon Reduction Commitment) was intended to be an incentive-based UK-wide scheme which built on the experience of the EU-Emissions Trading Scheme (see Section 2.4).¹⁹ However, the ‘carrot’ aspects of the incentives were reduced in late 2010, leaving mainly ‘sticks’ (see below). It extends the ETS central feature of detailed carbon auditing to cover all medium-large sized organisations which have not previously been involved. It also covers electricity consumption – indeed the criterion for entry is organisations with an annual half-hourly metered electricity use over 6,000MWh per year. (Universities already in the ETS carry on with that for fossil fuels, and participate in CRC for electricity and any fossil fuels not covered in the ETS). Participants are required to:

- Calculate their total organisation-wide energy use-related carbon emissions for each year and provide self-certified statements to the Environment Agency;
- At the start of each compliance year, purchase allowances (from the Government) to cover their anticipated total emissions; and

¹⁸ Sandbag, 2010. Cap or Trap. How the EU ETS risks locking in carbon emissions. September 2010. Available at <http://sandbag.org.uk/files/sandbag.org.uk/caportrap.pdf>

¹⁹ Scheme details available at: http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/crc/crc.aspx

- Surrender sufficient allowances to cover actual emissions at the end of each compliance year (buying additional ones if required, or selling surplus ones if emissions have been reduced).

The original scheme envisaged that the scheme would be 'revenue neutral', and that the money used to purchase allowances would be ring fenced, and returned to participating organisations at the end of the accounting year according to a 'league table' based on a combination of actual carbon performance, installation of metering, and conformance to the Carbon Trust Standard or equivalent (see section 3.5). However, much was changed in late 2010 by the Government's Comprehensive Spending Review. The Government will now keep the money paid for allowances.²⁰ In effect, the scheme has been turned into a carbon 'tax', with some extras.²¹ According to a consultation launched in November it is proposed that the scheme will operate in the following way:²²

- Phase I of the CRC runs from 1 April 2010 to 31 March 2014, and subsequent phases will each last for 6 years. Following the 2010 Spending Review the first year of 1 April 2010 to 31 March 2011 has been turned into a 'practice run' which just requires organisations to monitor their consumption. The first sale of allowances will take place in 2012 instead of 2011. Participants will be able to purchase allowances to cover their 2011/12 emissions at the end of the 2011/12 compliance year.
- During Phase I, initial allowances will be priced at a standard £12 per tonne of CO₂. If a university has a shortfall in allowances at the end of the reporting year it must buy sufficient allowances to cover it. Two sources will be available: 1) buying allowances from other participants who have a surplus, or 2) from the official scheme Administrator (a mechanism known as 'the safety valve'). The Administrator will cover the allowances sold under the CRC by purchasing equivalent allowances from the EU Emission Trading Scheme (see above). It is likely that either route will cost more than £12 per tonne (and possibly much more).
- The performance league table is to be retained. While it will not be used to recycle revenue back to participants, the government hopes that it will act as a reputational driver to lower energy use and emissions. The first table will be compiled and published in October 2011 as originally proposed.
- The requirement to make organisations using less than 6,000MWh, but with a half hourly meter, to make an annual information disclosure has been removed.

After Phase I it was intended that the Government will abandon the fixed price of £12 per tonne and set a total number of allowances (which will reduce annually). Scheme participants would then bid for allowances via an auction, with the assumption that would drive up prices considerably and so increase the incentives for energy efficiency. However, the Committee on Climate Change recommended that the fixed price allowances should be extended into Phase II and it may well be that this is adopted.²³

²⁰ Available at: http://www.hm-treasury.gov.uk/spend_sr2010_documents.htm

²¹ Heap, R., 2010 Spending Review: Warning over CRC "Stealth Tax". Article, Property Week, 20 October 2010. Available at: <http://www.propertyweek.com/professional/spending-review-warning-over-crc-stealth-tax/5007600.article>

²² DECC, 2010. Consultation on amendments to the CRC Energy Efficiency Scheme Order 2010. Closes 17 December 2010. Available at:

http://www.decc.gov.uk/en/content/cms/consultations/crc_amendment/crc_amendment.aspx

²³ Committee on Climate Change, 2010. The CRC Energy Efficiency Scheme – advice to Government on the 2nd phase, September 2010. Available at: <http://www.theccc.org.uk/reports/carbon-reduction-commitment>

Implications

Over 100 further and higher education institutions are expected to be full participants in the CRC. The CSR changes have made the scheme more financially negative in the short term, and will probably cost the sector over £10 million a year. However, the fact that it can no longer look forward to receiving this money back will considerably increase the incentive for energy efficiency.²⁴ It is also the case that the scheme is only likely to survive in the long run if it is clearly effective in driving energy efficiency, which will require much higher prices for allowances than the current £12 per tonne. (However, the experience of the ETS shows that this is not inevitable). The league table is also likely to become an important method of comparing the performance of institutions.

2.6 Renewable Energy/Low Carbon Requirements

There are currently a confusing number of targets, regulations and incentive schemes, and local authority requirements, to increase the proportion of building energy supply from renewable or low carbon (renewables + ultra efficient fossil fuel) sources. Some of these are ambitious national targets which will start to impinge directly on universities and colleges via sector mechanisms such as funding body requirements (see Section 2.7). These include:

- The carbon targets set by the Climate Change Act (legally binding UK greenhouse gas emissions reduction targets of at least 26% by 2020 and at least 80% by 2050, compared to 1990 levels);²⁵ and
- Renewable targets – the EU has a binding target of 20% of total energy consumption coming from renewables by 2020, and is generating individual targets for members, with 15% proposed for the UK. UK electricity generators are also required to source 15% of their supply from renewable sources by 2015.

The 2008 Planning and Energy Act²⁶ allows local councils in England and Wales to set reasonable requirements in their development plan documents for a) the proportion of energy used in a development from local renewable sources and/or local low carbon sources, and b) for energy-efficiency standards which go beyond Building Regulation requirements. This provides statutory backing for the 'Merton Rule', the planning policy developed by Merton Council, which requires 10% energy supply for large new developments to come from renewables. This was subsequently adopted by many other councils and has become part of national planning guidance. Some Councils have adopted even higher figures, e.g. 20% in Oxford City.

The Funding Councils for England, Scotland and Wales have also introduced or are planning sector level targets (see Section 2.7). A minimum level of zero/low carbon energy is also a mandatory requirement for BREEAM Excellent (see section 3.1).

Section 4 describes the various actual or potential financial incentives for installing renewables/CHP.

Implications

Many different drivers are converging to require more development of renewable/low carbon energy supply on higher education campuses.

²⁴ Schoon, N., 2010. CRC bombshell: Bad government, good for the environment. ENDS blog, 27 October 2010. Available at: <http://blogs.endsreport.com/carbonandenergy/>

²⁵ Information available at: http://www.decc.gov.uk/en/content/cms/legislation/cc_act_08/cc_act_08.aspx

²⁶ Campbell, L., 2008. Planning and Energy Act 2008 Receives Royal Assent, Simpson Millar solicitors website. Available at: <http://www.simpsonmillar.co.uk/news/news.aspx?newsid=318>

2.7 Funding Body Requirements and Guidance

HEFCE

In response to Government requirements that it respond to the requirements of the Climate Change Act in early 2010 HEFCE published, in collaboration with Universities UK and Guild HE, a Carbon Reduction Target and Strategy.²⁷ This strategy comprises, amongst other things:

- A sector-level target for scope 1 and 228 carbon reductions of 24% by 2020 and 80% by 2050 against a 1990 baseline, in line with UK targets; and
- A requirement for institutions to set their own targets for 2020 for scope 1 and 2 emissions against a 2005 baseline.

HEFCE also require annual monitoring and reporting on progress, through the Estate Management Statistics (these are now administered by the Higher Education Statistics Agency). HEFCE will also assess what is required to monitor and report scope 3 emissions, and this data will be collected after 2012. HEFCE expect a baseline of emissions from procurement to be measured by December 2012 and this will be followed by target(s) for scope 3 emissions by Dec 2013.

To provide funding incentives HEFCE will link capital funding to performance against carbon management plans. This will be achieved by adapting the Capital Investment Framework (CIF), developed in 2007 to assess the extent to which institutions had a strategic approach to infrastructure planning and investment. The revised CIF is referred to as CIF2. The CIF2 process²⁹, published in July 2010:

- Expands the metrics to include carbon emissions³⁰
- Amends the strategic questions to include a more specific and demanding requirement in relation to carbon
- Requires institutions to report on progress in implementing the carbon plans, and on the results.

HEFCE have also published guidance on developing carbon management plans³¹. They have indicated potential 'big' and 'quick' wins as lighting and electrical appliances (including ICT); building energy and space management; building fabric upgrade; efficient energy supply; renewable energy; and behavioural change and new ways of working.

Scottish Funding Council (SFC)

The Climate Change (Scotland) Act 2009 introduces targets to reduce emissions by at least 80 per cent by 2050 with an interim target of 42% by 2020.³² Sections 70 and 71 of the Act require the Scottish Government to extend permitted development rights for micro-generation technology for domestic and

²⁷ Available at: <http://www.hefce.ac.uk/lgm/sustain/carbon/>

²⁸ Where scope 1 emissions are direct emissions that occur from sources owned or controlled by the organisation; scope 2 accounts for emissions from the generation of purchased electricity and scope 3 all other indirect emissions. Source: the World Resource Institute. See HEFCE strategy footnote 3.

²⁹ HEFCE, 2010. Arrangements for the Second Capital Investment Framework (CIF). Circular letter 17/2010. 5 July 2010. Available at: http://www.hefce.ac.uk/pubs/circlets/2010/cl17_10/

³⁰ Carbon reduction metrics include tonnes of CO₂ per £ of income and tonnes of CO₂ per student and staff full time Equivalent (FTE). Environmental performance metrics include waste mass (tonnes) per student and staff FTE and water consumption (m³) per student and staff FTE.

³¹ HEFCE, 2010. Carbon Management Strategies and plans: a guide to good practice' (HEFCE 2010/02). January 2010. Available at: http://www.hefce.ac.uk/pubs/hefce/2010/10_02/

³² The Scottish Government, 2010. Towards a Low Carbon Economy for Scotland: Discussion Paper. March 2010. Available at: <http://www.scotland.gov.uk/Publications/2010/03/22110408/0>

non-domestic buildings. Section 72 of the Act requires local development plans to include policies on greenhouse gas emissions for all new buildings in their areas. Such policies will be considered in the preparation of new local development plans.

The Scottish Funding Council's (SFC) issued revised guidance on reducing carbon emissions and other environmental impacts.³³ It also requires a minimum of BREEAM 'Excellent' for new build, and 'Very Good' for refurbishment, for the Design and Procurement, and Post Construction, stages of all major capital works projects. In addition, SFC has part funded, and supported, the Universities and Colleges Climate Commitment for Scotland (see section 3.8).

HEFCW

HEFCW's Corporate Strategy and Corporate Plan and Operational Plan 2007-08 to 2009-10 states '*The delivery of HEFCW's strategic aims will demonstrate our clear and positive support for the outcomes targeted in Wales: A Better Country. We will ensure that its crosscutting themes of sustainable development, social justice, equality of opportunity and bilingualism continue to be mainstreamed into all of our core activities and business processes.*'

In HEFCW Circular 'Education for Sustainable Development and Global Citizenship (ESDGC)'³⁴, it states '*All HEIs are encouraged (via good practice examples) to develop a suitable environmental management system (EMS) and equivalent measures which cover all their operations in order to minimise their overall resource use to sustainable levels....HEFCW will not prescribe a single system of accreditation or EMS, but requires that all systems utilised by HEIs should obtain external certification to a recognised standard within a period of three years. We anticipate that most institutions will seek certification to ISO 14001, EMAS, BS 8555, or Eco Campus. Where institutions are proposing to use an alternative accreditation standard this should be clearly stated.*'

As with the SFC, HEFCW now requires BREEAM Excellent for both the Design and Procurement and Post Construction stages of new buildings funded by them. The Welsh Assembly has an aspiration for all publicly funded new developments in Wales to be 'zero carbon' from 2011. They will reconsider their position when the Building Regulations are devolved at the end of 2011.

Implications

The finding bodies' different approaches may mean that English, Scottish and Welsh respond differently to energy and carbon issues. The more specific BREEAM requirements of HEFCW and SFC, for example, may over time result in better energy performance in new build than in England. However, HEFCE, UUK and Guild HE have set the most challenging overall targets for the sector as well as a strategy for reaching those. The requirement to monitor and develop strategies for carbon reduction will ensure that institutions who do not already have detailed carbon management plans to develop those, and those who do not perform well will lose out in terms of capital funding. This will particularly hit the research-intensive Russell Group Universities hard, and they will need to start addressing emissions from laboratories and scientific computing. Universities will also have to start turning attention to its indirect emissions which could prompt a sea-change in procurement and travel strategies.

³³ Scottish Funding Council, 2008. *Sustainable Development Guidance for Estate Management*. March 2008. Available at: http://www.sfc.ac.uk/web/FILES/ReportsandPublications/Sustainable_Development_Guidance_March_2008.pdf

³⁴ HEFCW Circular W08/07HE, February 2008. Available at: http://www.hefcw.ac.uk/documents/publications/circulars/circulars_2008/W08%2007HE_circ.pdf

Section 3 – Non-statutory/Optional Schemes on Energy and Carbon

3.1 BREEAM

What is it?

BREEAM (Building Research Establishment Environmental Assessment Method) is used to assess the design and specifications of buildings.³⁵ (BREEAM Communities is also being developed to assess multi-building sites). It has a number of criteria which are grouped into eight headings – management; energy; health and well being; pollution; transport; land use; ecology; and materials. The design is assessed against the criteria, and scored as Pass, Good, Very Good, Excellent or Outstanding (an exceptional category, intended for only a few buildings a year). The 2008 revision of BREEAM has raised the bar considerably, with several HE buildings which were rated 'Excellent' in the previous version only achieving 'Good' in the new one. It has also introduced a Post Construction Review to better ensure that the design is actually implemented in practice. Another new scheme, BREEAM in Use, is available to assess the operation of buildings. BREEAM is also becoming more international, with a number of national versions being developed.

To be certified, the scoring has to be undertaken by BRE-trained and licensed Assessors. Previously most new or refurbished HE buildings have required a 'bespoke' assessment template, but almost all can now be assessed under BREEAM standard templates. Most will fall under the new BREEAM (Higher) Education scheme but some can be assessed under specialised schemes for Data Centres, Residences or Sports Centres. (In BREEAM (Higher) Education most credits are common to all buildings, but some specialist ones are only available for certain building types, such as laboratories). This will lower costs, provide known criteria from the start of the design process, and enable greater comparison of schemes.

The main advantages for an institution adopting BREEAM are that it provides clear and recognised guidelines for the design team to work to, and is now reasonably stretching, especially if Excellent is required. It also enables clients to make a statement about their commitment to sustainability (although this is only impressive if they aspire to Excellent for new buildings, and Very Good for refurbishments). If the design is independently certified, there can be further reputational benefits from good performance, and from the additional driver for improvement created by designers' awareness that their plans will be scrutinised more thoroughly.

Criticisms of BREEAM include its points-based nature (which can allow positive performance in some areas to offset poor performance in others); its limited emphasis on carbon issues (which BRE says misses the point that it is a holistic scheme covering all environmental impacts); poor value for money; criteria which are not entirely relevant, or are difficult to apply, to HE buildings; a lack of integration to the design process (a factor in many buildings only achieving Very Good when Excellent was the target); and a limited emphasis on performance in use. Many of the points have been addressed in the 2008 BREEAM generic revision and/or the specifics of the new BREEAM HE scheme.

A number of organisations attach BREEAM conditions to public funding. For example the Scottish Funding Council and HEFCW both require BREEAM 'Excellent' ratings on new builds and 'very good' is commonly required for refurbishments.

The Scottish Government's proposed new labelling system (See Section 2.1) will give recognition to achieving compliance with the 2010 building standards as a base level of sustainability, as well as developing

³⁵ <http://www.breeam.org/page.jsp?id=158>

awards that recognise higher sustainability standards. If this system is implemented, which is likely, it may make BREEAM in Scotland somewhat redundant.

In England HEFCE is not currently requiring specific levels of performance for capital projects but BREEAM policies and actions will influence the environmental assessment within the 2010 Capital Investment Framework (see Section 2.7).

A new version of all BREEAM schemes is likely to be introduced in 2011, and should raise the performance bar even higher than at present.

Implications

BREEAM's credibility and impact has been significantly improved by the 2008 revision, and by its internationalisation. Many public and private organisations are specifying its use, including HEFCW and SFC who now require BREEAM Excellent for both the Design and Procurement, and Post Construction stages of new buildings funded by them, and Very Good for major refurbishments. BREEAM HE also provides a framework for more sharing of experience about, and benchmarking of, key sustainability features of buildings in the sector.

3.2 Government Buying Standards and other Procurement Initiatives

What is it?

There are several inter-linked schemes of relevance to higher education:

- Government Buying Standards³⁶;
- The Energy End Use and Services Directive³⁷
- The EcoDesign Directive³⁸; and
- Energy Star³⁹.

The Government's Buying Standards (formerly known as 'Buy Sustainable – Quick Wins' standards) are a set of purchasing specifications that encourage the procurement of more sustainable goods and services, they are developed to show that through good sustainable procurement you can cut costs and reduce carbon whilst looking after the environment. Specifications are available for a range of commonly-purchased products, such as IT equipment, white goods, furniture and paper as well as new-build construction and major refurbishment. They establish minimum and best practice levels of performance. For example the minimum specification for fridges and freezers is that they have 'A'-rated efficiency, and do not use HFCs, while the best practice specification is they have 'A+' rated efficiency.

The standards will be updated every few years to ensure that they are keeping up with market developments. For example, all the office machinery product standards underwent extensive review in 2009. The next changes expected in the specifications for office IT equipment are in 2011.

The EU Energy End Use and Services Directive requires the implementation of cost-effective sustainable procurement and energy efficiency measures. It places particular emphasis on the public sector which is

³⁶ Information available at: <http://www.defra.gov.uk/sustainable/government/advice/public/buying/index.htm>

³⁷ http://ec.europa.eu/energy/efficiency/end-use_en.htm

³⁸ Information available at: http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/index_en.htm

³⁹ Information available at: <http://www.eu-energystar.org/en/index.html>

expected to play an 'exemplary role' and undertake at least two of 6 measures listed in Annex VI. The UK government has to report to the European Commission on the following measures⁴⁰:

- a) promoting the purchase of equipment and vehicles based on lists of energy-efficient product specifications of different categories of equipment and vehicles to be drawn up by Defra, using, where applicable, minimised life-cycle cost analysis or comparable methods to ensure cost-effectiveness;
- b) promoting the purchase of equipment that has efficient energy consumption in all modes, including in standby mode, using, where applicable, minimised life-cycle cost analysis or comparable methods to ensure cost-effectiveness;
- c) promoting energy efficiency and energy savings as a possible assessment criterion in competitive tendering, including supporting guidance.

For central government this voluntary agreement is set within the framework of Government Buying Standards, that all Government Departments are mandated to use.

While HEFCE cannot mandate universities to comply with the measures, they have agreed they will make all efforts to make the sector aware of the measures and monitor them.⁴¹ Promotion is being done through sector bodies such as the Sustainable Procurement Centre of Excellence (SPCE) and the Association of University Procurement Officers (AUPO) and letters to university procurement heads, while monitoring is being done through the voluntary Efficiency Measurement Model (EMM) reporting system which reports on Value for Money targets.⁴² This year the EMM annual return will include data on efficiencies delivered based on the Energy Services Directive (i.e. energy savings as a result of procuring Energy Service Directive-compliant products.

Any actions will be complemented by the EU Ecodesign Directive. This allows the European Commission to set performance requirements for the manufacture and use of many kinds of product that are sold within the EU market. The Directive also requires Member States to put in place a Market Surveillance Authority (MSA), which has powers to carry out checks on products, request relevant information from manufacturers and request the withdrawal from the market of non compliant products. To date, Member States have approved Regulations for ten product groups.⁴³ These measures are coming into force throughout 2009 and 2010/11. They will eventually cover many more (30+). Once introduced, Government Buying Standards are likely to be changed to reflect them.

Energy Star is a voluntary eco-labelling scheme based on minimum energy performance criteria. It was originally developed by the US Environmental Protection Agency (US-EPA) and applies to a variety of products in the USA, including data centres. However, its application to office products is now a joint activity with the European Commission. This means that specification of Energy Star compliance in tenders is compatible with EU procurement rules, provided the text states 'not less than Energy Star or equivalent'.⁴⁴ For ICT, there are currently specifications for desktop computers, notebook computers,

⁴⁰ http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/saving_energy/esdirective/esdirective.aspx

⁴¹ Butcher, S, HEFCE, Personal Communication, Dec 2010

⁴² Carpenter, R., 2010. Efficiency Measurement Model Annual Report for 2009-10. In *Procurement Matters*, Issue 7, December 2010, available at: <http://www.procureweb.ac.uk/about-the-sector/procurement-matters-news>

⁴³ Standby and off mode power Consumption, Simple Set Top Boxes, External Power Supplies, General and Tertiary Lighting, Motors, Televisions, Circulators and Refrigerators.

⁴⁴ Defra legal advice, Personal Communication I. Barham, October 2010. When putting the Government Buying Standards relating to Energy Star in contracts in the wider public sector, the text needs to say "not less than Energy Star or equivalent." Under Article 6, central government buyers should insist that products meet Energy Star or equivalent. The wording in the relevant directive states "energy-efficiency requirements not less demanding than the

integrated desktop computer, thin clients, small-scale servers (i.e. non data-centre), workstations, game consoles and monitors. A list of compliant models can be obtained from www.eu-energystar.org.

Version 5.0 for Computing Equipment⁴⁵ was introduced in 2009, with a new measure of Typical Energy Consumption (TEC) over a year, based on standard assumptions about the time spent in different operational modes (on, off, sleep and idle). The figures are based on the top 25% performing products on the market in 2008, and therefore raised the bar considerably from Version 4.0.

Implications

Buying Standards and Energy Star provide useful criteria for purchasing a range of equipment and should be a central part of institutional procurement policies. They can provide an easy win for institutions to make significant reductions in carbon at little or no extra cost, through specifying more energy efficient products, especially when these will be switched on for much of the time. In England HEFCE is also working with AUPO's Sustainable Procurement Group and the sector's Sustainable Procurement Centre of Excellence (SPCE) to promote the Energy Services Directive requirements and encourage monitoring of efficiency savings as a result of procuring more energy efficient equipment.

3.3 Universities that Count

What is it?

Universities that Count (UTC)⁴⁶ assesses the state of an institution's environment and social responsibility (CR), based on the Corporate Responsibility Index developed by Business in the Community (BiTC). It allows universities and colleges to benchmark themselves against other institutions and businesses. The scheme has been developed by The Environmental Association for Universities and Colleges (EAUC), following a national pilot exercise involving 25 sector institutions in collaboration with the Higher Education Funding Council for England, , and Leeds Metropolitan University. Most of the index questions are the same as in the main CR Index, but considerable work has gone into a new set of questions on Teaching, Learning, Research, and Knowledge Exchange, designed by sector academics. Guidance notes for the sector have also been developed. Universities commit to changing their current practices, with support from UCT, then submit their results via a detailed index so that overall sector performance can be recorded year on year.

There are two benchmarking options for universities:

- (1) The Environmental and Social Responsibility (ESR) Index which starts with University Strategy, and then looks at how strategy is embedded into behaviour and practice – and then how each of the 'four pillars' of ESR are managed – Environment, Community, Workplace and Marketplace (students and suppliers). It also consider impacts on social and environmental performance, including Teaching, Learning, Research and Knowledge Exchange. Finally, the survey examines Assurance processes and Disclosure; the degree of sharing that universities engage in.
- (2) The Environmental Index is shorter and focuses on environmental sustainability.

The use of a common set of Index questions between business and higher education (HE) respondents enables cross-sector benchmarking and best practice comparison.

Common Specifications" which, by implication, means any requirements (ie equivalent) that are not less demanding than Energy Star.

⁴⁵ Available at: http://www.eu-energystar.org/downloads/legislation/20090624/L161_16_20090624_en.pdf

⁴⁶ Information available at: <http://www.eauc.org.uk/utc>

In 2009/10 54 institutions took part which included 60% Russell Group universities. The 2009/10 annual report⁴⁷ grades participants as gold, silver, bronze or participants, in line with BiTC's Companies that Count scheme. Three participants achieved the gold standard – University of Bradford, Nottingham Trent University and HEFCE.

The scheme will next be run in 2011/12, i.e. it is skipping a year. This is both to give participants time to reflect on how their performance can be improved, and to iron out teething problems in the way the scheme works.

Implications

Providing the information required is time consuming, and requires inputs from many different areas of the organisation. This can be a burden but can also make the scheme very effective in reaching the areas that other schemes cannot. Its high public visibility could also make it a powerful driver in institutions concerned about their public reputation in this field.

3.4 Green League

What is it?

An annual ranking of all UK universities according to environmental performance by student environmental organisation People & Planet. The Green League⁴⁸ considers both a commitment to systemic environmental management and performance indicators, and in 2010 had 11 assessment areas, with a total of 70 possible points (see Table 3). The information is collected from a combination of a People & Planet questionnaire, the Estate Management Statistics, the Fairtrade Foundation, Soil Association/Sustain and the Sound Impact Environmental Award Scheme.

The Carbon Management criteria covers Scope 3 emissions (specifically procurement, staff and student business trips, commuting and travel by students at the start and end of term) even though these are currently excluded from the sector wide targets at national level. This is because an estimated 50% of a university's footprint comes from the emissions embedded within the goods and services procured. Since 2010 the Green League awards points for sustainable food procurement in the Sustainable Procurement section and this will widen to include other areas of procurement. Another change is the strengthening of the criteria on student engagement to cover staff and this will be expanded to include the integration of sustainability into the curriculum from 2011 onwards.

Organisations are awarded grades: first, 2.1, 2.2, third or 'did not sit exam' according to their scores. Grade boundaries are set after the scores are collated. In 2010, 25 universities achieved a 'first' with University of Plymouth ranked top.

There has been criticism of the Green League methodology, especially by estates and environmental professionals. People and Planet say that these criticisms are being taken on board with adjustments to the criteria each year.

⁴⁷ Available at: [http://www.eauc.org.uk/file_uploads/2009-10_utc_full_annual_report-complete-final_\(big\)_1.pdf](http://www.eauc.org.uk/file_uploads/2009-10_utc_full_annual_report-complete-final_(big)_1.pdf)

⁴⁸ Information available at: <http://peopleandplanet.org/greenleague>

Table 3: 2010 Green League Criteria and Scoring

Management and Policy	Score	Performance	Score
Publicly Available Environmental Policy	6	Energy Sources	6
Environment Management Staff	8	Waste	8
Environmental Auditing & Management Systems	8	Carbon emissions per head	8
Ethical investment policy	4	Water consumption	8
Carbon management	8		
Sustainable Procurement and Fairtrade	3		
Staff and student engagement	0-3		
Sub-total	40	Sub-total	30

Implications

The scheme attracts widespread media publicity and has been very successful in attracting the attention of vice-chancellors (especially in the top and bottom ranked institutions). Hence, it has provided an extra stimulus to action for poorly performing universities (or additional recognition for well performing universities). However, the lack of consensus about its validity does make it less effective than it otherwise might be.

3.5 Carbon Trust Programmes

What is it?

The Carbon Trust has three main programmes of relevance to higher education:

- The HE Carbon Management Programme⁴⁹;
- The Carbon Trust Standard⁵⁰; and
- The HEFCE/Salix Finance Revolving Green Fund (see section 4.2).

The HE Carbon Management Programme is aimed at providing a framework, and practical support, for institutions to assess and reduce their carbon emissions. It is administered by the Carbon Trust, with support provided by sub-contracted consultants. As of May 2010, it had been, or was being, run at 114 HE bodies.

The programme takes the form of a year long, five step, process - mobilising the organisation; setting baseline, forecasts and targets; identifying and quantifying options; developing a fully-costed strategy and implementation plan; and implementing the plan. Participants receive support from expert consultants in areas such as provision of analysis software and tools, training and workshops for staff and senior management, and identifying carbon saving projects. An average minimum university input of 2 days per week for a year is also required.

Organisations going through the programme will have met many of the requirements of the Carbon Standard (see below) and the carbon plan requirements for CIF2 (see section 2.7).

⁴⁹ Information available at: <http://www.carbontrust.co.uk/carbon/PublicSector/he/>

⁵⁰ Information available at: <http://www.carbontruststandard.co.uk/>

The Carbon Trust Standard requires organisations to meet the following criteria:

1. Footprint measurement: an organisation must measure its footprint accurately and include all required emission sources;
2. Reduction: an organisation must achieve an absolute reduction in its footprint, or an equivalent relative efficiency improvement; and
3. Carbon management: appropriate carbon governance, accounting, reduction methods and targets of an organisation.

Organisations can certify themselves, or have Carbon Trust assistance, paying a fee which is linked to the annual energy bill (£8000 in the case of one large university). Regular recertification is required.

As of September 2010 39 universities, and HEFCE, had achieved the Standard. A major driver for this was the fact that the Standard was meant to be an element in calculating the performance 'league table' of the CRC Energy Efficiency Scheme (see Section 2.5), which in turn would influence the financial impacts on participants. However, the changes and uncertainty in the CRC now seem to have made it much less central to it.

Implications

The Carbon Management Programme has helped many institutions. However, there has also been criticism that it leaves people at the point where they most need help, i.e. implementation of their plans. The Carbon Standard is aimed at helping with this, and other support may be put in place in future – the Trust are currently piloting implementation support offerings. However, some have doubts about how much the Standard improves performance in universities and colleges which already have a strong commitment. The changes in the CRC may also reduce the level of interest in achieving it .

3.6 ISO 14001 and Related Standards

What is it?

ISO 14001 is the International Standards Organisation's standard for Environmental Management Systems (EMS).⁵¹ It is built on the ISO 9001 standard for Quality Management Standards, and also has a number of supporting ones such as ISO 14031, on Environmental Performance Measurement. The Standard is based on four stages, plan, do, check and act:

- *Plan* involves the identification of key customers and stakeholders, identifying opportunities for improvement and the development of programmes to achieve them;
- *Do* is the implementation of these programmes, through standardised procedures and other means;
- *Check* is the monitoring and reviewing of progress, wherever possible against quantitative targets; and
- *Act* involves changing, if necessary, existing programmes and using the learning from them to begin the cycle again with new plans.

Organisations can use the standard as a guide, or they can achieve formal certification by undergoing a compliance audit from an accredited external assessor. The certification lasts for 3 years. An annual surveillance audit (which can be done internally) is also required.

⁵¹ Information available at: <http://www.iso14000-iso14001-environmental-management.com/>

In addition to direct environmental benefits, an ISO-compliant EMS can help universities and colleges to

- Have assurance that all environment-related risks are understood and managed;
- Achieve better internal communication, and integration of actions; and
- Create cost savings and other financial benefits.

The University of Glamorgan was the first UK university to achieve an ISO 14001 accredited EMS for all its activities. A few others have followed. Some have also achieved ISO 14001 registration for part of their activities, such as Leeds Metropolitan University who have concentrated on the areas of biggest environmental impact (estates and financial services), or individual units, such as the National Oceanography Centre at the University of Southampton. Cranfield University's School of Applied Sciences have gained an ISO 14001 accreditation for their Microsystems and Nanotechnology Cleanroom and Precision Engineering Laboratory activities.

Implications

An EMS can help risk management, by ensuring that systematic efforts are made to identify environmental effects and related risks, devise actions to mitigate them, and assign responsibility for their implementation. The same benefits can also arise in areas such as energy consumption and carbon emissions, although other initiatives such as the CRC (section 2.5) mean that these areas will be a focus in any event. Opinion tends to be split on the value of a full EMS in higher education (as opposed to limited systems covering specific topics). Some - including HEFCW, which is making them mandatory for Welsh universities and colleges (see Section 2.7) - see them as a real, cost-effective, driver of awareness and action, but others regard them as bureaucratic 'tick box' exercises and/or as ill-fitted to the complexities of university campuses.

3.7 EcoCampus

What is it?

EcoCampus provides a support package to enable institutions to implement a robust and effective Environmental Management System (EMS).⁵² The scheme aims to develop participant's skills, knowledge, competence and expertise in implementing and operating an EMS through the provision of a variety of tools and guidance including software applications, training workshops, advice and external audit.

Ecocampus conforms with the requirements of the international standard for EMS, ISO 14001, and therefore offers a staged approach to achieving it if that is a desired outcome. As with all EMS, it is meant to cover all aspects of environmental impact ranging from carbon emissions to biodiversity protection and covering all aspects of an institution's activities including transport to and from the campus, and supply chain management. It was initially developed at Nottingham Trent University and therefore 'fits' further and higher education.

EcoCampus has four stages:

- Bronze (achieved by Planning actions such as an environmental review and developing a policy)
- Silver (achieved by initial Implementation actions such as establishing objectives, targets and programmes)
- Gold (achieved by Operating actions such as training and preparation of documentation) and

⁵² Information available at: <http://www.ecocampus.co.uk/>

- Platinum (achieved by Checking and Correcting previous actions through auditing and other means).

Progress through the stages is achieved by independent audit against the EcoCampus achievement criteria. Audit is undertaken in partnership with UKAS accredited EMS certification body NQA. Details on this are recorded on the EcoCampus register.

As of September 2010 36 Further and Higher Education Institutions had enrolled for eco-campus with 18 achieving gold, silver or bronze awards, and one, Aberdeen College, achieving platinum.

Implications

As a purpose-designed scheme for the sector, EcoCampus is obviously very relevant to higher education. It provides a flexible approach and enables institutions to gain recognition for their performance improvements as they move towards a full EMS cycle, and the full rigour of an ISO14001 compliant scheme. However, it has the same disadvantages as an ISO-based approach (see above), whilst some institutions which want an EMS may feel that a full blooded commitment to relatively rapid implementation is the best means of achieving it.

3.8 Green Impact Universities

What is it?

Green Impact Universities is an NUS (National Union of Students) environmental accreditation scheme with an awards element designed for university and college departments. It is based on a similar initiative developed for student unions (the Green Impact Awards) and was piloted at the University of Bristol. The current scheme is project managed by the EAUC and delivered locally by participating universities and Student's Unions. It has run at 22 universities in 2009/10 and 37 in 2010/11.

University staff take part each academic year and, depending on the number of environmental actions, they carry out, can achieve either: a working towards accreditation or Bronze, Silver or Gold awards for making their workplaces greener. A bespoke workbook, containing a list of practical actions (which form the bronze, silver and bonus criteria), is developed for each institution. These actions address a particular institution's bad habits and are worded so that they complement wider institutional environmental policy and procurement processes. The criteria address energy and carbon directly (e.g. switching off lights) and indirectly (e.g. reducing waste or through procurement) as well as addressing the wider sustainability agenda (e.g. encouraging biodiversity and fundraising for charities).

Environmental champions are encouraged to form a team, or get their wider department onboard, and they then complete the workbook to achieve as many of the criteria as possible. Staff are encouraged to form Green Impact teams themselves, finding their own level, rather than prescribing fixed departments.

A team of volunteer student auditors are recruited and trained to verify the responses in the workbooks. Teams or departments then receive confidential feedback showing how they fared. A local Green Impact awards event is held to celebrate the individual and collective achievements, usually involving senior management from the institution, resulting in positive local media stories.

The scheme runs over an academic year, starting with the workbook being developed in departmental audits taking part in August / September, and concluding with an awards event typically between April and June.

Implications

Green Impact has been successful at a number of universities, partly because of the simplicity and positive nature of the scheme, and partly because of the competitive element which pits departments against each other. By rewarding success with recognition, it can be a simple way of motivating staff and departments to save energy and carbon.

3.9 The Universities and Colleges Climate Commitment for Scotland (UCCCfS)

What is it?

The UCCCfS is a voluntary initiative for Scotland's universities and colleges to address the impacts of climate change at an institutional level.⁵³ Signatories must produce and publishing a 5-year Climate Change Action Plan a year after signing the commitment. The Plans must include measurable targets and timescales to achieve a significant reduction in emissions from all business operations and activities. Each of the following UCCCfS headings should be addressed, either outlining what actions are to be implemented or demonstrating why they are not a priority:

- To enhance our learning and teaching through the provision of skills, modules and courses;
- To promote our research capacity and knowledge exchange activity in sustainability;
- To reduce our carbon emissions – cutting energy consumption and substituting energy sources;
- To encourage waste reduction, recycling and responsible disposal;
- To deliver sustainable estate development – through both maintenance and capital programme;
- To achieve sustainable and active travel through sustainable travel planning; and
- To engage with suppliers / service providers on responsible procurement of good and services.

Annual progress reports must also be published. As of September 2010, 56 institutions had agreed to sign the Commitment, constituting over 89% of universities and colleges in Scotland. The UCCCfS was developed with financial support from the Scottish Funding Council and through collaboration with other sector bodies and is managed by the Environmental Association of Universities and Colleges.

In the Scottish Government's new energy efficiency action plan for Scotland⁵⁴ it states:

“Most colleges and universities have completed a Carbon Management Programme, and over 80% have signed up to the Universities and Colleges Climate Commitment for Scotland (UCCCfS). The UCCCfS requires participants to publish a 5 year Climate Change Action Plan with measurable targets to achieve emissions reductions, including from energy consumption, and to report on progress annually. We will continue to support and work with colleges and universities to help them build upon existing work, providing access to the Carbon Management Programme and interest-free energy efficiency loans. Going forward we will engage with the Scottish Funding Council to encourage colleges and universities to utilise this support and to sign up to the UCCCfS. Through the Scottish Funding Council, we will also explore how they might feed in to the target setting and reporting which we are seeking from the public sector under this action plan.”

⁵³ Information available at: http://www.eauc.org.uk/scotlands_principals_climate_commitment

⁵⁴ Scottish government, 2010. Conserve and Save: The Energy Efficiency Action Plan for Scotland. October 2010. Available at: <http://www.scotland.gov.uk/Resource/Doc/326862/0105383.pdf>

4. Financial Opportunities

4.1 Zero and Low Carbon (ZLC) Technologies

There are a number of actual or potential financial incentives for these, including:

- Feed-in tariffs, enabled by the 2008 Energy Act⁵⁵, came into effect on 1 April 2010. These payments to anyone who owns a renewable electricity system (5MW ceiling), for every kilowatt hour they generate, provide a good financial incentive for renewables. A renewable heat feed in tariff is expected in 2011 which has no upper limit to the equipment eligible ;
- Universities and colleges producing electricity from eligible renewable sources can sell Renewables Obligation Certificates (ROCs – one per megawatt hour)⁵⁶ to generators, who count them towards their 15% target (see above); and
- Refunds of the Climate Change Levy (CCL)⁵⁷ – a surcharge on fossil fuel generated electricity – for any use of CHP, or renewable energy sources which are not claiming ROCs.

In December 2010 the Government announced changes to the RO with mandatory reporting against greenhouse gas and land sustainability criteria for solid and gaseous biomass, and mandatory sustainability criteria for bioliquids.⁵⁸

The Government's Comprehensive Spending Review⁵⁹, published October 2010, announced £1 billion of funding for a Green Investment Bank. This was a recommendation of an earlier Commission⁶⁰, though details on how the bank will operate have yet to be announced. However it is likely that the Carbon Trust will be folded into the new bank.

4.2 Salix Finance

Salix Finance Ltd provides interest free funding to increase capital investment in energy efficient and low carbon technologies in Higher Education Institutions (HEIs), as well as other public sector bodies. Salix has to date funded energy efficiency projects in 75 HEIs. In England it does this in partnership with HEFCE, via the Revolving Green Fund for Institutional Small Projects Fund.⁶¹ This has to date pushed £18m into projects that reduce carbon in the sector. Funding is provided jointly by HEFCE and Salix Finance as a conditional grant to those HEIs that joined the scheme before March 2009. Institutions are then required to add, as a minimum, a further 25% of the total grant to create a ring-fenced fund; this fund is used to finance energy-saving projects across the HEI's estate. Salix recycling funds also operate in Scotland and in Northern Ireland. In Scotland match funding is provided by the Scottish Executive Government and in Northern Ireland the client institution has to match the funding.

⁵⁵ Information available at: http://www.decc.gov.uk/en/content/cms/legislation/energy_act_08/energy_act_08.aspx

⁵⁶ Information available at: <http://www.ofgem.gov.uk/Sustainability/Environment/RenewablObl/Pages/RenewablObl.aspx>

⁵⁷ Information available at:

http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageExcise_InfoGuides&propertyType=document&id=HMCE_CL_001174

⁵⁸ DECC, 2010. Government response to Statutory consultation on the Renewables Obligation Order 2011 (ROO 2011) & Consultation on changes to Renewable Energy Guarantees of Origin (REGOs). Available at:

<http://www.decc.gov.uk/en/content/cms/consultations/ro/ro.aspx>

⁵⁹ See footnote 20.

⁶⁰ Green Investment Bank Commission, 2010. Unlocking investment to deliver Britain's low carbon future. July 2010.

Available at: <http://www.climatechangecapital.com/thinktank/cc-Thinktank/publications.aspx?year=2010&month=6>

⁶¹ Information available at: http://www.salixfinance.co.uk/higher_education.html

Salix funds the installation of proven technologies (including insulation, lighting, combined heat and power plants and low energy ICT) that:

- Reduce carbon dioxide emissions; and
- Realise long-term financial savings through reduced energy consumption.

The financial savings made from projects are then paid back into the fund to finance further energy-saving projects.

Once a fund is established it becomes self-sustaining and can be in operation for 15-20 years as savings generated by completed energy saving projects are recycled back into it, to finance further projects. Only when the institution has exhausted all possible projects does the fund have to be repaid to HEFCE/Salix Finance. It is expected that the money in each fund will be recycled at least 3 times.

The recoverable grant element of the fund can only be used to finance energy efficiency and renewable energy projects with long-term CO₂ savings and financial savings. They must comply with one of the following criteria:

- A payback period of 5 years or less with a cost of no more than £100 per tonne life-time carbon saved; or
- A payback period of 7.5 years or less with a cost of no more than £50 per tonne life-time carbon saved.

However, HEIs' additional contributions can be used to finance projects with more relaxed compliance criteria - a payback period of 10 years or less with a cost of £400 per tonne of lifetime carbon saved.

To help clients assess whether proposed projects meet the ISP Fund criteria, Salix provides a Project Compliance Tool⁶²: an easy-to-use Excel based tool which, once the client inputs basic information (project costs, estimated savings, technology type and building life expectancy), automatically assesses whether the project is compliant.

Salix has funded a wide variety of technologies, which are detailed on its web site. The best performing categories in terms of payback in 2009/10 were Computers & IT; motor controls and office equipment.⁶³ Two areas where Salix is more likely to be used in future are ICT and laboratories.⁶⁴

Implications

At a time of financial stringency, Salix funding is a beacon of light that can allow continued progress towards low carbon campuses. However, there needs to be a transition from the Estates-focused schemes such as boiler renewal and CHP which have been a major element in the first stage, to ones which involve user communities more e.g. IT, laboratories. This is where much of the 'low hanging fruit' is now situated but achieving it often requires more awareness amongst users that Salix funds are available, and/or more collaboration between them and Estates.

⁶² Available at: http://www.salixfinance.co.uk/england_clients.html

⁶³ Smyth, P., 2010. Salix Funding and ICT. Presentation to workshop on Energy Efficient ICT – Salix funded investment opportunities. Nottingham Trent University, 23 September 2010. Available at: <http://www.goodcampus.org/events/info.php?siteID=&refnum=53&startnum=A0>

⁶⁴ SustelT, 2010. Briefing 2: Salix funding for energy efficient ICT. Available at: <http://www.goodcampus.org/files/index.php?siteID=>

Section 5 - Analysis

The previous sections demonstrate the breadth and depth of the environmental requirements now facing universities and colleges. They also demonstrate that they are likely to become more challenging, in order to meet longer term Government targets and social expectations. In the case of carbon emissions, for example:

- The Government target of an 80% reduction target by 2050 would translate into a 2-3% annual reduction for each individual institution if crudely allocated; and
- The road map of planned building regulation tightening in England and Wales will require buildings designed in 2013 to be almost twice as energy efficient as those in 2006, and new buildings to have all of their energy from renewable or low carbon sources by 2019.

The trend towards disclosure- and incentive-based regulation also means that universities and colleges will face increasing financial and reputational risk from poor performance. Combined with the financial squeeze on universities with Government's planned public sector funding cuts, the need to cut energy costs is both an opportunity and a challenge.

Some institutions are responding proactively to this challenge but, in general, the sector has been reactive. The price of this is that new or refurbished buildings are still being designed for the environmental demands of 2010, rather than those of they will operate under in 2019 or 2029. This problem is compounded by dealing with key regulations or activities such as BREEAM or the CRC Energy Efficiency Scheme in a short-term, operations focused, way, rather than integrating them into a strategic process which exploits their potential to drive improvement. In the absence of this, they all too easily become low level and/or tick box exercises which actually distract attention from day to day energy management and other activities.

Figure 2 outlines such a strategic approach, and how the different regulations and activities described in earlier pages can fit within it. Its central messages are that:

- Institutions should be establishing their strategic goals – and the actions which flow from it – in accordance with, but also to some degree independently of, specific regulations or activities. This is because these can sometimes duplicate or overlap; because the best and most flexible way of satisfying many – such as the Carbon Reduction Commitment – is as a consequence of 'deep change' producing across the board improvement, rather than short-term actions to meet specific requirements; and because the letter of regulatory requirements can change over time (although their spirit will remain);
- A key aspect of operational activities is metering, monitoring and targeting (MMT), with the aim of building a full picture of energy and water use (and therefore, indirectly, many carbon emissions) within the organisation. This enables the best improvement opportunities can be identified and acted upon. Future regulations are likely to require more of this anyway so a medium-term plan to achieve accurate information - through metering and other means - on the consumption not just of individual buildings, but of key activities within them (e.g. heating, ventilation, significant equipment) is vital;
- EcoCampus or full ISO14001 compliant systems can be useful in providing a 'spine' to support and co-ordinate different activities, but this objective can sometimes be achieved through simpler alternatives;

- The outcomes reported under the CRC, or for building certification, are simply snapshots at a point in time – the image they are capturing will be constantly changing (and improving) if stretch targets are being met, and so to some degree they will take care of themselves; and
- Schemes such as BREEAM Higher Education, building certification, and the Estates Management Statistics are providing unprecedented opportunities to compare and benchmark performance, which could be a key driver of continuous improvement over the medium-long term.

Existing buildings are likely to form the bulk of a university's carbon emissions and better management of these should be a key focus of this strategic process. However, new and refurbished buildings are the targets of many of the previously discussed regulations and schemes, and – in an operational life which is likely to be many decades – will strongly influence the sector's future footprint. The Government's ambitious targets in this area mean that they are unlikely to be achieved without new technologies, and changes in the design process to ensure that:

- The professional design team and key sub-contractors have demonstrated experience of achieving very low energy buildings with acknowledged environmental credentials;
- There is a thorough pre-design process which rigorously analyses the requirements of a building; defines clear, measurable, energy and environmental performance objectives to guide subsequent implementation; and achieves good communication between, and shared assumptions amongst, the design team and between the team, customers and key contractors;
- There is a holistic design and development process which iteratively considers all the key building elements and features in relation to one another, and which incorporates the views of key stakeholders such as users and maintenance staff, as well as contractors. (This approach results in better functionality and avoidance of expensive errors (such as over-sizing of equipment and resultant wasteful energy consumption);
- Effective project management which balances all the performance objectives (including the energy and environmental issues), and ensures that key design features are not lost because of time pressures, contractor resistance, or other factors;
- There is sensible value-engineering based on whole life costing, and reflecting the long-term requirements of the regulations described in this document. This should avoid the frequent practice of eliminating relatively small amounts of capital cost only to incur much higher operating costs through increased consumption of utilities, more expensive maintenance, and other unanticipated outcomes; and
- Effective quality control occurs throughout the process so that the performance objectives are delivered in practice (e.g. by including independent commissioning engineers from the start of the process).

Figure 2: A Strategic Process for Energy and Environmental Issues

