

# **ENVIRONMENTAL SUSTAINABILITY STRATEGY 2008 - 2013**

**July 2008**

## **Environmental Sustainability Strategy**

### **Executive Summary:**

Harper Adams University College is firmly committed to environmental sustainability, which is at the heart of its strategic mission, namely 'Higher education for the delivery of a sustainable food chain and rural economy.'

The institution has a central role to play in supporting rural environmental sustainability in terms of farming production and environmental management, the use of natural resources, novel renewable energy technologies and the development of sustainable communities. To fulfil this role the University College will lead by example by striving to implement best practice and continually reviewing and improving its environmental performance.

Harper Adams University College has made significant progress to improve its environmental impact since the introduction of the institution's first Environment Strategy in 2002. The University College has reduced per capita energy consumption through numerous energy efficiency measures, whilst renewable energy is generated by a biomass Combined Heat and Power generator and photovoltaic roof tiles. The curriculum has been enhanced in areas relating to the environment, biodiversity on the College farm has been encouraged and sustainable farm management processes implemented.

Harper Adams University College's latest Environmental Sustainability Strategy (2008-2013) aims to build on improvements implemented to date. The Strategy contains two sections. The first provides the strategic context to current and planned initiatives within Harper Adams University College. Section one outlines why it is important to improve the College's environmental impact, describes how the Environmental Strategy links with other College strategies, and introduces the concept of the rural village-farm model. This model presents the relationship between Harper Adams University College and the College farm as a sustainable model for the interaction between rural villages and neighbouring farms, whereby a farm provides products and services for a nearby community. The biomass Combined Heat and Power facility at the College is one possible example of a village-farm interaction.

The second section of the Environmental Sustainability Strategy is the Action Plan, which presents and prioritises environmental improvements that the College intends to implement between 2008 and 2013. Importantly these improvements are categorised according to Environmental Sustainability Indicators, which will enable the College to benchmark current and future performance.

The Environmental Sustainability Strategy functions not only to provide strategic direction to the environmental improvements implemented by Harper Adams University College, but also serves to communicate to staff, students and external organisations the institution's commitment to the environment. Through identification of Environmental Sustainability Indicators we expect the College's progress to be better monitored, quantified and disseminated during the lifetime of this Strategy.

## **Introduction**

1. This document sets out the College's strategic plans for taking forward its Environmental Sustainability Strategy to 2013. The Environmental Sustainability Strategy builds upon the College Environmental Strategy, which covered the period 2002-2007. The Environmental Sustainability Strategy is necessary to ensure the College's environmental aims and objectives are clearly defined and effectively implemented and managed.

2. The Environmental Sustainability Strategy aims to address the following broad principles:

- Where is the College currently with regard to environmental sustainability?
- Where does the College want to be?
- How will the College achieve its environmental sustainability aims and objectives?

3. The Environmental Sustainability Strategy broaches the environmental sustainability aspirations of the College in a structured manner, defining the College's commitment and providing an overview of the main external drivers and an explanation of the link to the Strategic Plan and component strategies. The Environmental Sustainability Strategy includes a project plan, which documents and prioritises key environmental sustainability indicators, and includes definition of key milestones, attributing their implementation to members of College staff.

## **The College's Mission and Long Term Vision**

4. In 2002, a major shift in the agricultural industry towards more sustainable farming practices and stewardship of the environment was signalled with the publication of the Report of the Policy Commission on the Future of Farming and Food (The Curry Report<sup>1</sup>). This was followed by a fundamental Government-commissioned review of the way in which rural services are to be delivered and support for the farming industry is to be provided<sup>1,2</sup>. The Governments response<sup>3</sup> to both reports set out an overarching aim of creating sustainable rural development and sustainable rural communities. The College's mission and vision are not only to be able to secure high quality academic services, but also to support this national agenda for change.

5. The College mission is:

'Higher education for the delivery of a sustainable food chain and rural economy'

6. The College vision is to maintain a high quality university College made distinctive by:

- Activities closely related to the needs of the rural economy and industries reliant on that economy, with a specific commitment to farming for sustainable environments and knowledge transfer to support the rural economy.
- Activities contributing to sustainable consumption and production, renewable energy generation, protection of natural resources, and human and animal welfare.
- The development of new markets for students from a wider range of backgrounds supported by appropriate course and pedagogic developments.
- The provision of a learning environment and promotion of a student culture that enhance employability.

<sup>1</sup>*Farming and Food: A Sustainable Future*. Report of the Policy on the Future of Farming and Food, HMSO, January 2002.

<sup>2</sup> *Rural Delivery Review (The Haskins Report)*, DEFRA, November 2003.

<sup>3</sup> *The Rural Strategy 2004*, DEFRA, July 2004.

- Strong industry links that add business relevance to the College's role in higher education and encourage lifelong learning.
- A central role for the College in the provision of higher education for the rural economy, during and beyond the planning period.

### **Scope of the Environmental Sustainability Strategy**

7. Environmental sustainability refers to the long-term maintenance of valued environmental resources in an evolving human context. In order to improve sustainability we must reduce the size of our ecological footprint by reducing the amount of resources we use, and waste and emissions we produce. This definition encourages implementation of renewable energy and energy efficiency technologies, improved soil and water management, and recycling. The scope of this strategy addresses each of these areas.

### **External Drivers Influencing the Sustainable Development Strategy**

8. The following section sets out the key factors and policy areas that relate and influence the College's Environmental Sustainability Strategy.

9. Climate change presents a serious threat to human society and the natural environment. During the last century the earth warmed by approximately 0.6°C, largely due to increased greenhouse gas emissions from human activities<sup>4</sup>. Without action to reduce greenhouse gas emissions global temperatures are expected to rise by 1.4-5.8°C by 2100, with sea levels rising by 0.09-0.88 metres compared to 1990 levels<sup>4</sup>. Globally this will result in more extreme weather occurrences (floods, droughts), with developing countries at higher risk of disease, hunger and flooding. Within the UK we can expect to see more frequent flooding and warmer winters<sup>4</sup>, which will ultimately affect UK agriculture by altering the types of crops grown, pests and weeds encountered<sup>5,6</sup>.

10. The Kyoto protocol is an international agreement to fight climate change by reducing emissions of six greenhouse gases, including Carbon Dioxide and Methane. The protocol came into force in February 2005 and was ratified by more than 160 countries<sup>6</sup>. Under the agreement industrialised countries agreed to reduce their collective emissions by 5.2% compared to 1990 levels by 2010<sup>7</sup>. Each country has an individual target to cut greenhouse emissions. The UK's Kyoto target is to cut greenhouse emissions by 12.5% below 1990 levels by 2012. Statistics suggest that agriculture is responsible for 42% of UK methane emissions (DEFRA). Approximately 10% of UK agricultural methane emissions arise from the storage of animal slurry, providing a strong argument for development of anaerobic digestion as a mechanism to harness a proportion of these emissions<sup>8</sup>.

11. The Renewables Obligation came into force in April 2002 and requires licensed electricity suppliers to source a specific, and annually increasing percentage of electricity from renewable sources. The target was 6.7% in 2006, increasing to 15.4% by 2015<sup>9</sup>. Under the obligation eligible renewable energy generators receive Renewable Obligation Certificates (ROCs) for each MWh of electricity generated. These certificates can then be sold to electricity suppliers in order for them to meet their obligation. Consequently the Renewables Obligation can improve the financial viability of renewable energy projects at Harper Adams University College.

12. In March 2005 the UK Government published its sustainable development strategy

<sup>4</sup>*Climate Change: The UK Programme 2006*. HM Government. March 2006.

<sup>5</sup>*Climate Change and Agriculture in the United Kingdom*. UK Ministry of Agriculture, Fisheries, and Food. 2000.

<sup>6</sup>*The Impacts of Climate Change on Agriculture*. DEFRA. February 2005.

<sup>7</sup>International Action: The UN and the Kyoto Protocol. [www.defra.gov.uk](http://www.defra.gov.uk).

<sup>8</sup>Methane Emissions by Source. DEFRA e-statistics [www.defra.gov.uk](http://www.defra.gov.uk).

<sup>9</sup>Renewable Energy Policy. [www.dti.gov.uk/energy/index.html](http://www.dti.gov.uk/energy/index.html).

‘Securing the Future’<sup>10</sup>, which contained four priorities – sustainable consumption and production, climate change and energy, natural resource protection and sustainable communities. The strategy reflected on the need to educate the UK population to enable them to make more sustainable choices. The strategy conveys the idea of a one planet economy, which will require a major shift to deliver new products and services with a lower environmental impact across their lifecycle, and new business models that meet this challenge whilst boosting competitiveness. The four priority areas highlighted in the Government’s sustainable development strategy are echoed in The Regional Sustainable Development Framework<sup>11</sup> produced by the Government Office for the West Midlands.

13. In 2005 The Higher Education Funding Council published ‘Sustainable Development in Higher Education’<sup>12</sup>, which provided a vision in which the higher education sector in England is seen as a major contributor to society efforts to achieve sustainability, within the next ten years. The strategy aims to encourage the higher education sector to:

- Embed the principals of sustainable development in its values and activities.
- Develop curricula and pedagogy to enable students to develop the values, knowledge and skills to contribute to sustainable development.
- Strengthen links to business, the community, civil society, government and others in pursuit of sustainable development.
- Build the new skills, knowledge, and tools needed for sustainable development through research.
- Continuously improve its own impact on the environment, society and the economy.

14. The Department for Trade and Industry’s (DTI: now the Department for Business, Enterprise and Regulatory Reform) Sustainable Development Action Plan<sup>13</sup> is committed to creating an innovative, highly competitive and resource efficient economy that delivers high levels of environmental and health protection for everybody. The DTI believes this can be achieved by harnessing innovation and enterprise to develop commercially viable, internationally competitive solutions to environmental problems. The DTI’s Sustainable Development Action Plan is important to the College in that it provides an indication of the department’s commitment to developing the UK’s sustainable technology resource, and commitment to funding research and development programmes.

15. The Regional Development Agency, Advantage West Midlands, has produced a Sustainable Development Policy<sup>14</sup>, which is principally concerned with developing environmentally sustainable services, companies, and products. This policy demonstrates to the College the agency’s commitment to funding projects, demonstration and R&D, with an environmentally sustainable focus. Ultimately this provides assurance that funding will be available for projects identified in this strategy.

16. The Strategy for Sustainable Farming and Food<sup>15</sup>, published by DEFRA, recognises that whilst agriculture generates significant environmental benefits it also has a significant negative impact on the environment (e.g. water pollution, emissions to atmosphere). The Strategy for Sustainable Farming and Food identifies key principals for sustainable farming and food, which include:

- Supporting the diversity and viability of rural and urban economies.
- Enabling viable livelihoods to be made from sustainable land management.
- Respecting and operating within the biological limits of natural resources

<sup>10</sup> *Securing the Future – UK Government Sustainable Development Strategy*. HM Government. March 2005.

<sup>11</sup> *Securing the Regions Future*. Government Office for the West Midlands. May 2006.

<sup>12</sup> *Sustainable Development in Higher Education*. HEFCE. 2005.

<sup>13</sup> *DTI Sustainable Development Action Plan*. DTI. 2005.

<sup>14</sup> *Advantage West Midlands Sustainable Development Policy and Action Plan*. AWM. February 2006.

<sup>15</sup> *Strategy for Sustainable Farming and Food*. DEFRA. 2002.

(especially soil, water and biodiversity).

- Achieving consistently high standards of environmental performance by reducing energy consumption, by minimising resource inputs, and by using renewable energy.

The Strategy for Sustainable Farming and Food provides direction to the College and the College farm with respect to enhancing environmental sustainability within the land based sector. The College has already taken steps to support the diversity and viability of rural and urban economies and communities through development of the business clubs, particularly the Sustainable Technologies Network. Bullet points 2 and 3, above, are addressed through the farm which provides a working example of sustainable land and natural resource management. The College and College farm both work to achieve bullet point 4 as discussed previously in this document.

17. Fig. 1 illustrates how the College Environmental Sustainability Strategy addresses the related and influential strategies reviewed above. The figure also recognises the relationship between the Environmental Sustainability Strategy and the West Midlands Regional Energy Strategy<sup>16</sup> and Sustainability West Midlands: documents/organisations that have been produced in response to ‘Securing the Regions Future’.

### **Environmental Sustainability aims, objectives and expertise**

18. Further to the mission and vision of the College outlined in points 4-6, and specific to environmental sustainability the College is committed to:

- Ensure compliance with environmental legislative requirements.
- Follow codes of best practice where possible.
- Wherever practical and possible minimise energy usage and waste, reduce emissions, recycle materials and incorporate renewable energy generation.
- Enhance biodiversity and minimise activities that reduce biodiversity.
- Minimise release of Greenhouse gases to the atmosphere.

19. To achieve our environmental sustainability objectives we will employ a set of core values to underpin our work, namely to:

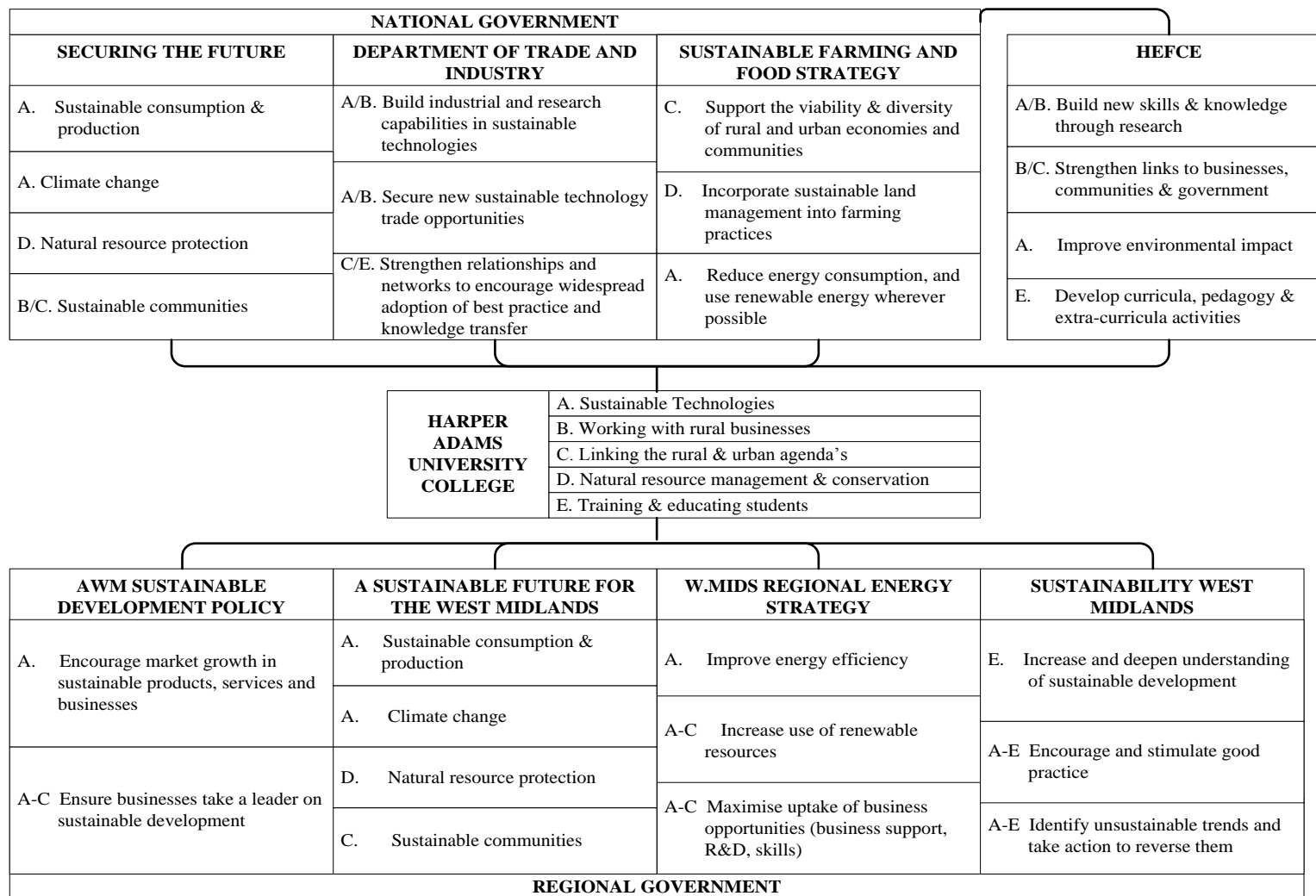
- Train and educate staff and students with regards to sustainable best practice, particularly in the areas of resource efficiency, recycling, energy efficiency, renewable energy production, conservation of natural resources, and welfare.
- Develop a set of sustainable indicators to monitor the College’s performance.
- Communicate environmental and sustainable development policy and practices to staff, students, and the public.
- Review relevant policy and practices on a regular basis and ensure that they support the strategic objectives of the College.
- Ensure relationships are correctly aligned.

20. In addressing our commitments and delivering our intentions, we will focus on particular areas of expertise. These are:

- Sustainable technologies (rural).
- Working with rural businesses.
- Training and educating students.
- Natural resource conservation and management.

Finding ways to link the rural and urban environmental agendas.

<sup>16</sup>West Midlands Regional Energy Strategy. Government Office for the West Midlands. November 2004.



**Fig. 1: Mapping key College expertise to the major elements of national and regional government sustainable development policies.**

21. The College has developed significant expertise in the area of rural sustainable technologies that includes development of a Centre of Excellence in biomass for energy generation. This centre houses a world first small-scale Combined Heat and Power (CHP) generator that is fuelled with a variety of types of dry biomass. Placement of the generator at the College provides the manufacturer with the opportunity to conduct developmental work whilst additionally demonstrating the facility to visitors to the College. Location of the generator at the College is associated with research and development opportunities that include the investigating the suitability of different types of biomass (e.g. coconut shell, cocoa husks), process economics and the suitability of fuel processing equipment. Concurrently the College is developing expertise in Anaerobic Digestion (AD) through a project to investigate the value of digestate as a replacement for mineral fertiliser.

22. The College has significant experience of successfully working with rural businesses to present diversification opportunities, develop skills and expertise, and disseminate knowledge. In relation to environmental sustainability the College has established the West Midlands Sustainable Technologies Network that aims to broadly research, develop and demonstrate rural sustainable technologies at the College. The College co-established the Bioenergy West Midlands Initiative with the West Midlands Farming and Food Team. BioenergyWM was established to promote interest and activity in, and markets for, bioenergy (energy from biomass, biogas and biofuel) in the West Midlands. The College is the lead organisation for the National Rural Knowledge Exchange (NRKE) that aims to promote and develop the rural economy by using academic skills and knowledge to work with rural businesses and communities.

23. The College is establishing an increasingly unique position in the UK higher education sector, where its specialist focus on the rural economy and communities is supported by the breadth of its academic subject base in rural matters. The College enjoys a national (and increasingly international) reputation for the quality of its work, in terms of teaching, third-stream activities and research. To maintain the College's unique position in the UK and its reputation for excellence in teaching the curriculum is continuously reviewed in light of the dynamic external environment. The increasing importance of environmental sustainability is reflected in course content, particularly within the more practical courses. The College's commitment to teaching environmental sustainability is reflected in the development of an undergraduate degree in Sustainable Resource Management. This course includes modules in which students will be provided with a solid understanding of the environment, renewable energy, soil and water management, non-food crops, and climate change. Further to development of new courses, existing course content will be further reviewed and modified in the future with regards to environmental sustainability.

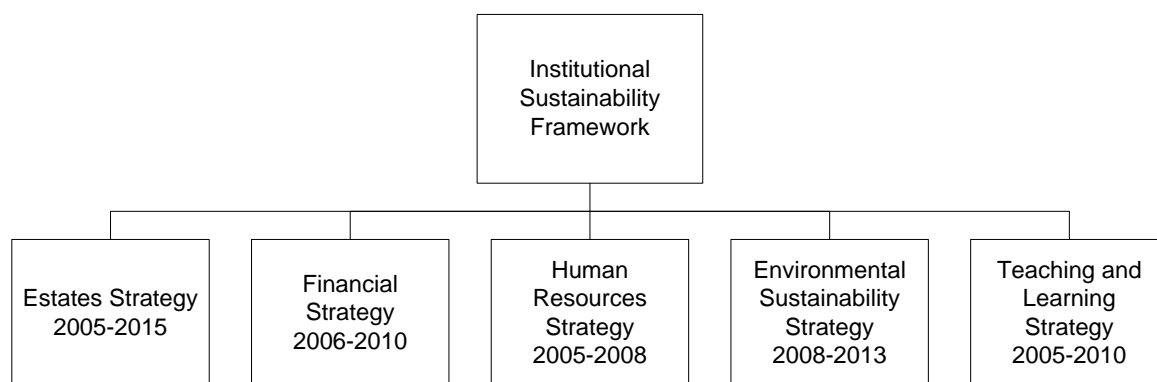
24. The College has significant expertise in the field of natural resource conservation. For example, research programmes include investigating the impact of agriculture on farmland birds and the use of digestate as a mechanism for nutrient recycling. College expertise in natural resource conservation and management are reflected in many undergraduate courses, for example Agriculture and Environmental Management, Countryside and Environmental Management and Sustainable Resource Management.

25. Historically the urban and rural agendas have been relatively distinct. However there are many similarities between the urban and rural agendas in the field of environmental sustainability that the College has identified. For example, development of small-scale

Anaerobic Digesters is of interest to the rural agenda for treatment of farm waste, and the urban agenda for processing catering and kitchen waste. Dissemination of information regarding national grid connection and Renewable Obligation Certificates is of interest to both rural and urban renewable electricity generators. Although the College vision is principally concerned with the rural economy and reliant industries, links and promotion of College activities to the urban agenda are demonstrated. For example delegates at previous bioenergy seminars and conferences have included those from a rural and urban environment. Development of R&D and demonstration projects includes collaboration with both urban and rural companies and Higher Education Institutions.

**Link between the Environmental Sustainability Strategy and other College Strategies**

26. The Institutional Sustainability Framework Plan provides information on the long term sustainability of Harper Adams University College, and takes into account the College’s Strategic Plan (2005-2010) in addition to the Estates, Financial, Academic and Environmental Sustainability sub-strategies (Fig. 2).



**Fig. 2: The relationship between the Institutional Sustainability Framework and College sub strategies.**

27. The fundamental principle behind the Institutional Sustainability Framework is ‘adaptive capacity’, in which the College aims to manage key resources so as to at least maintain the current capacity of the institution to respond effectively to changing demands. Directly related, the Environmental Sustainability Strategy enhances the capacity of the College to respond effectively to changes in environmental demands by:

- Preparing a strategic approach to address environmental changes, such as climate change, energy security and price fluctuations, and environmental policy.
- Identifying benefits presented by environmental sustainability, such as improving the College’s carbon footprint, reducing the institutions dependency on fossil fuels and presentation of diversification opportunities to the rural and urban setting.
- Developing mechanisms to address the consequences of environmentally negative actions. For example, developing and promoting anaerobic digestion as a mechanism to reduce greenhouse gas emissions produced as a result of farming activities.

28. Environmental sustainability forms an important component of the four broad areas outlined in the Institutional Sustainability Framework – namely money, people, equipment and buildings. The Environmental Sustainability Strategy serves to unite and enhance the

environmental sustainability elements of the Estates, Human Resources, Financial and Teaching and Learning Strategies, which are discussed below.

29. The Estates Strategy aims to provide a high quality physical environment that is cost effective, environmentally sustainable and safe for students, staff and visitors. The College estate presently features many elements of sustainability. The Bioenergy Development Centre houses a novel biomass Combined Heat and Power unit, which produces renewable electricity and heat for the College estate. The Bamford Library features the use of sustainable building materials, natural ventilation, energy-efficient lighting and rainwater harvesting. Whilst a new Student Hall of Residence, built in 2005, incorporates photovoltaic roof tiles.

30. The Estates Strategy 2005-2015 plans to build upon the sustainable features detailed in point 29. Specifically the Estates Strategy plans to:

- Develop comprehensive recycling facilities for general College waste.
- Install on-farm anaerobic digestion utilising farm slurry as feedstock.
- Encourage sustainable transport amongst staff and students.
- Continue to benchmark the College's performance via the Business in the Community regional benchmarking and other HE sector benchmarking systems.

31. The Financial Strategy 2005-2010 focuses on four key themes, namely long-term financial viability, investment in productive resources, efficiency and value for money and integration of College strategies with financial issues. Within these themes and with reference to environmental sustainability the Financial Strategy commits to:

- Recognise new opportunities that should be judged in terms of strategic benefits as much as financial merits. Photovoltaic roof arrays are associated with long payback periods (in excess of 40 years) that make them financially unattractive. However the College has installed a photovoltaic system on a new student hall of residence because of strategic benefits including endorsement of UK technology, development of the College as a sustainable technology demonstration centre, and promotion of the College as innovative and forward thinking.
- The College's Value for Money plan aims to maximise resource efficiency and waste minimisation, whilst also introducing sustainable sources of energy.

32. The Teaching and Learning Strategy supports incorporation of research and reach-out activities in the curriculum. The Teaching and Learning Strategy aims to continuously review the curriculum in light of the dynamic external environment. Incorporation of environmental sustainability in the curriculum is currently variable dependent on subject area. For example the course BSc (Hons) Countryside and Environment Management contains many modules with sustainable elements: Environmental Monitoring, Environmental Pollution Issues in the Countryside, Water Quality Management, Sustainable Systems, and Environmental Assessment and Management. Conversely undergraduate business degrees contain negligible reference to environmental sustainability. In view of this, and the recommendations presented in HEFCE's 'Sustainability for Higher Education', the curriculum will be reviewed and elements of environmental sustainability incorporated where appropriate.

33. The Human Resources Strategy is key to promoting and delivering changes in curriculum development and delivery, learner support and professional teaching standards

staff will embrace over the strategies planning period. Furthermore the Human Resources Strategy will promote and deliver the skills and expertise required to implement the actions detailed in the Environmental Sustainability Strategy. For example, staff training to those involved in operating sustainable technologies, and development of expertise to analyse energy use.

34. The Reach-Out and Research Strategies are also related to the Environmental Sustainability Strategy. Two of the four research themes identified in the Research Strategy incorporate environmental sustainability. Innovation for agriculture includes investigation of the impact of agriculture on farmland birds, and the impact of climate change on crop quality. Management of alternative crops and farm waste incorporates investigation of farming for energy crops, agricultural waste utilisation using clean and sustainable technologies and technologies for slurry and waste management.

35. The Reach-Out Strategy identifies innovation for sustainable farming as a key theme, delivered principally through the Sustainable Technologies Network. The principle objectives of this network are to (i) demonstrate near market or mature sustainable technologies at the College campus, (ii) develop environmental and sustainable technology research opportunities and (iii) to facilitate knowledge exchange to the public. Demonstration and research projects include the Bioenergy Development Centre and Photovoltaic roof array detailed in point 10. Knowledge exchange activities include providing 'tours', seminars, conferences, and literature to individuals with an interest in environmental sustainability.

#### **The Rural Village-Farm Model for Environmental Sustainability**

36. Harper Adams University College has a central role to play in supporting rural environmental sustainability in terms of farming production and environmental management, the use of natural resources, novel renewable energy technologies and the development of sustainable communities. The mission of the College maps clearly on to providing the professional personnel, capable of reflective engagement in this agenda, together with the evidence-base to support new working practices, to help deliver important rural aspects of the Framework over the next planning period.

37. The relationship between Harper Adams University College as a Higher Education Institution and the College farm represents a sustainable model for the interaction between rural villages and neighbouring farms, whereby a farm provides products and services for a nearby village. The biomass Combined Heat and Power facility at the College is put forward as an example of the village-farm interaction. In this case the College farm operates as an energy generator, producing fuel and utilising it to generate renewable electricity and heat that is then sold to the College. The College-farm interaction provides a unique opportunity for demonstration and replication of environmentally sustainable systems in other rural settings. Additionally, study of the College-farm interaction enables the economic, practical and environmental feasibility of the arrangement to be investigated. The Environmental Sustainability Strategy aims to further develop projects which demonstrate the village-farm supply model. Anaerobic Digestion of farm waste for the production of heat and electricity for the College campus is an example of one such project.

### **Alignment of Key Environmental Sustainability Actions within the College**

38. The College is committed to reducing its carbon footprint and improving its environmental sustainability, with considerable progress achieved to date. To enhance the College environmental credentials and to provide a benchmark against which future progress can be quantifiably compared, a set of Environmental Sustainability Indicators have been identified as documented in Table 1: the College Environmental Sustainability Action Plan.

39. Over recent years the College has dedicated substantial resource to enhance the institutions environmental sustainability. To further advance the College's environmental performance the institution plans to implement additional schemes, which are detailed within the College Environmental Sustainability Action Plan. Current and proposed schemes will be delivered by the College, the College Farm, or through interaction between the two, as illustrated in Fig. 3. For example, the College Farm is considered responsible for improving water and soil quality, whilst establishing recycling services are considered the responsibility of the College and more specifically the Estates Department. Several projects are positioned at the interface between the College and the College Farm. For example, Anaerobic Digestion will be located on the College Farm, which will operate the facility and provide feedstock, whilst the unit will provide educational and research opportunities for College students and staff.

### **Goals, Project Plan and Priority Areas**

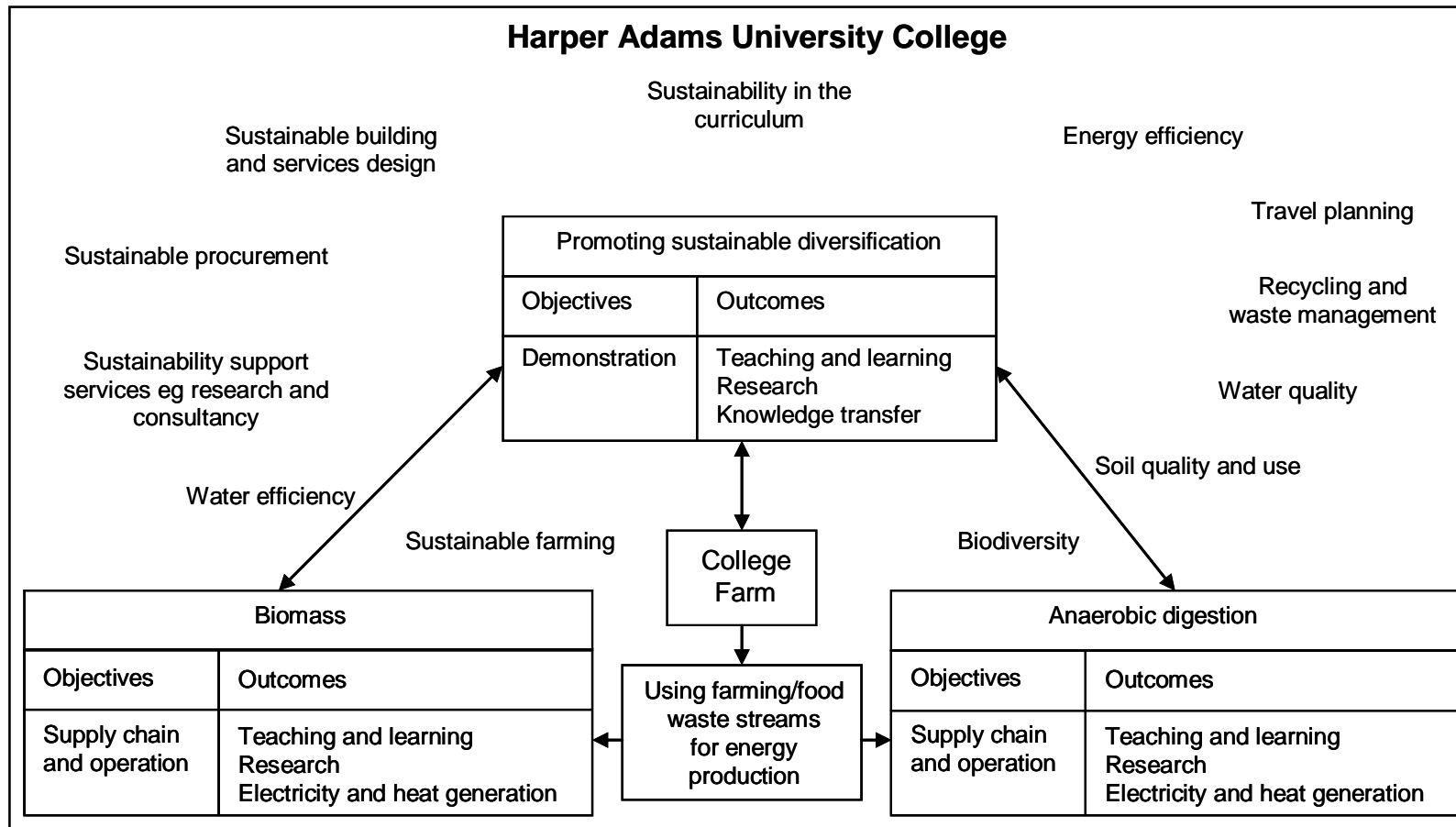
40. The Environmental Sustainability Action Plan (Table 1) has been developed in response to the Environmental Sustainability Strategy.

### **Management, Monitoring and Evaluation**

41. The College Executive will monitor progress with the implementation of the action plan. This document provides the basis of the environmental sustainability elements of the Annual Operating Statement. The Academic Board and the Board of Governors will each receive regular reports on progress with Annual Operating Statement Objectives over the planning period.

### **Using collaboration to achieve our aims**

42. The College recognises that the achievement of best practice in environmental sustainability will require commitment and time from a wide range of College staff. The College is keen to learn from best practice elsewhere and to collaborate, where appropriate to achieve its objectives. Through the Environmental Association for Universities and College's the College is able to gain best practice from other Higher Education Institutions, whilst participation in organisations such as the Business Environmental Support Scheme for Telford enables us to learn about environmental best practice as applied in the private sector.



**Fig 3: Alignment of environmental sustainability projects between the College and the College Farm**

**Table 1: Environmental Sustainability Strategy: Goals and Project Plan**

Environmental Sustainability Indicators have been prioritised according to ease and importance of implementation by the equation:

$$\text{Priority} = \text{Ease of implementation} \times \text{Importance of implementation.}$$

Ease of implementation is rated on a scale of 1 -3, with 1 representing easy and 3 difficult.

Importance of implementation is rated on a scale of 1 - 3, with 1 representing very important.

Consequently the priority associated with implementing the environmental sustainability indicators is rated on a scale of 1 – 9, with 1 representing highest priority.

Sustainable Indicator	Where are we now?	Where would we like to be?	Implementation		Priority	Action/ Responsibility
			Ease	Importance		
<b>I. Natural resources and waste:</b>						
Environmental Sustainability Indicators in the Natural Resource Management Group will draw expertise from the areas of Sustainable Technologies (Rural), Natural Resource Management and Conservation and linking the urban and rural agendas.						
<ul style="list-style-type: none"> <li>Energy efficiency                             <ol style="list-style-type: none"> <li>Gas/ electricity use per m<sup>3</sup></li> </ol> </li> </ul>	Gas and electricity use for the College as a whole is known, but has not been converted to ‘use per m <sup>3</sup> ’.	Monitor energy use of residential and non-residential buildings to allow patterns of demand to be identified and visual displays produced with the aim of encouraging energy efficiency. A milestone is reduction of CO <sub>2</sub> emissions arising from energy use by 36 % by 2010. This is in line with the West Midlands Regional Energy Strategy target.	2	1	2	i. Install building-by-building monitoring. ii. Produce benchmark figures for energy use. ii. Analyse energy use for each building and identify trends. iii. Promote energy efficiency among staff and students. iv. Monitor energy use. v. Produce a case study comparing energy use for the Bamford Library with a comparable non-sustainable building.  Responsibility: Estates Manager Action requires allocation of funding.
<ul style="list-style-type: none"> <li>Raw material use efficiency                             <ol style="list-style-type: none"> <li>Water use per m<sup>3</sup></li> </ol> </li> </ul>	All water at HAUC is abstracted from the HAUC borehole. Currently we do not know how much water is wasted through leakage etc.	Building-by-building monitoring would enable water use per m <sup>3</sup> to be quantified, and would provide a benchmark for future water use.	2	2	4	i. Install building-by-building monitoring. ii. Produce benchmark figures for water consumption. iii. Analyse trends in water use. iv. Monitor water use.  Responsibility: Estates Manager Action requires allocation of funding

<ul style="list-style-type: none"> <li>Recycling and waste management</li> <li>3. Amount of paper recycled</li> <li>4. Number of aluminium cans recycled</li> <li>5. Number of glass bottles recycled</li> <li>6. Number of ink cartridges recycled</li> <li>7. Amount of oil recycled</li> <li>8. Amount of plastic recycled</li> </ul>	<p>The College has an established policy for disposal of wastes. For example there is a system in place for paper recycling.</p>	<p>The College's recycling policies should be promoted to ensure all staff and students are aware of these facilities. At least one recycling bin for waste paper should be located in each building. Other recycling bins for aluminium cans, glass bottles, ink cartridges, and plastic will be located appropriately. Data should be collected regarding amount recycled to allow statistical analysis and visual display.</p>	<p>1 1 1 1 2 3</p>	<p>1 1 1 1 2 1</p>	<p>1 1 1 1 4 3</p>	<p>i. Assess current and future level of recycling. ii. Locate and promote recycling bins as appropriate. iii. Produce a guidance document to inform staff and students of the recycling facilities at the College, and what happens to the materials after they have been collected by the College.</p> <p>Responsibility: Estates Manager and Director of Corporate Affairs.</p>
<ul style="list-style-type: none"> <li>Renewable energy generation</li> <li>9. Type and amount of renewable energy generated</li> </ul>	<p>The College is committed to demonstrating renewable energy technologies. Currently the College demonstrates a world-first Biomass CHP generator developed by Talbott's Heating (100 kW<sub>e</sub>, 200 kW<sub>h</sub> and a newly developed Photovoltaic roof array (~8,624 kWh/year).</p>	<p>Further development of the College's capacity to generate renewable energy, to include installation of an Anaerobic Digester to treat farm waste.</p>	<p>1</p>	<p>1</p>	<p>1</p>	<p>i. Gain funding and develop plans to install an Anaerobic digester for treatment of farm waste with subsequent renewable heat and electricity generation.</p> <p>Responsibility: Farm Manager and Sustainable Technologies Network Manager.</p>
<p><b>II. Carbon Minimisation:</b> Environmental Sustainability Indicators in the Carbon minimisation Group will draw expertise from the area of linking the urban and rural environmental agendas.</p>						
<ul style="list-style-type: none"> <li>Travel planning</li> <li>10. Number of cars on campus</li> <li>11. Number of people car sharing</li> <li>12. Number of people cycling/ walking to Harper Adams.</li> </ul>	<p>A survey in 2002 suggested students make a large number of relatively short car journeys. The road to Newport is busy which discourages cycling or walking to work.</p>	<p>Reduce travel to and from HAUC.</p>	<p>2 2 2</p>	<p>2 2 2</p>	<p>4 4 4</p>	<p>i. Further encouragement of the car-sharing scheme. ii. Consult with Telford and Wrekin regarding developing a safe cycle path and improving the local bus service. iii. Survey staff and student travel practices and develop a College Travel Plan.</p> <p>Responsibility: Director of Corporate Affairs.</p>

<ul style="list-style-type: none"> <li>Greenhouse gas emissions</li> <li>13. Carbon savings through generation of renewable energy</li> <li>14. Carbon savings through improvements in energy efficiency</li> <li>15. Methane emission reductions through sustainable manure storage and animal emissions (related to diet)</li> <li>16. Ammonia emissions</li> <li>17. Pesticide use/ hectare (would need to take into account toxicity rating of pesticide)</li> </ul>	<p>Carbon savings are considered difficult indicators to measure as they do not take into account all our carbon emissions. Emissions are not currently quantified. Methane emissions are difficult to measure, and as such have been classed as low priority.</p>	<p>See point 1 and 8. Installation of an anaerobic digester would reduce methane emissions and enable methane emission savings to be quantified (volume of gas and gas composition would be analysed). Pesticide use per hectare should be easier to calculate than previously because records are held on the computer main system.</p>	<p>1</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p>	<p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>3</p>	<p>1</p> <p>3</p> <p>6</p> <p>6</p> <p>9</p>	<p>i. Carbon savings for specific activities will be quantified.</p> <p>ii. Quantify ammonia emissions and pesticide use per hectare.</p>
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### III. Conservation and the Environment

Environmental Sustainability Indicators in the Conservation and the Environment Group will draw expertise from the areas of Natural Resource Conservation and Management.

<ul style="list-style-type: none"> <li>Biodiversity</li> <li>18. Number of specific wild birds and plants</li> <li>19. Diversity of trees and hedges planted</li> </ul>	<p>A wildlife and conservation survey was completed several years ago. This survey has not been revisited.</p>	<p>Formal documentation of biodiversity at the College.</p>	<p>2</p> <p>2</p>	<p>3</p> <p>3</p>	<p>6</p> <p>6</p>	<p>1. Complete a conversation survey to assess biodiversity on the College Estate.</p> <p>2. Compare findings of recently repeated wildlife and conservation survey and the survey completed several years ago..</p>
<ul style="list-style-type: none"> <li>Soil quality</li> <li>20. Organic matter content</li> <li>21. Phosphorous status</li> <li>22. Erodability</li> </ul>	<p>HAUC use to have labs that would analyse the entire farm soil quality every 4 years. Now only a few soil samples are analysed as samples are sent away for analysis.</p>	<p>Aim is to revert back to analysing samples at HAUC every 4 years. Soil erodability is difficult to measure, but could be achieved through risk assessment via a student project. Results of soil analysis used to develop a strategy to improve soil quality if necessary.</p>	<p>1</p> <p>1</p> <p>2</p>	<p>3</p> <p>3</p> <p>3</p>	<p>3</p> <p>3</p> <p>6</p>	<p>i. Revert to analysing entire farm soil quality every 4 years.</p> <p>ii. Measure soil erodability every 4 years through student projects.</p> <p>iii. Implement measures to improve soil quality as necessary.</p> <p>Victoria Talbott to be directed to re-establish College facilities for soil and water analysis.</p>

<ul style="list-style-type: none"> <li>Water quality           <ul style="list-style-type: none"> <li>23. Nitrate</li> <li>24. Sulphate</li> <li>25. Phosphate</li> <li>26. pH</li> </ul> </li> </ul>	The Environment Agency currently measures the water quality of Black Brook. Previously HAUC measured the water quality.	Analysis of Black Brook water quality, potentially through student projects. Results of water analysis used to develop a strategy to improve water quality if necessary.	1 1 1 1	2 2 2 2	2 2 2 2	<ul style="list-style-type: none"> <li>i. Establish a system to measure water quality of Black Brook annually.</li> <li>ii. Implement measures to improve water quality as necessary.</li> </ul> <p>Victoria Talbott to be directed to re-establish College facilities for soil and water analysis.</p>
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#### IV. Sustainable Research and Teaching

The College's unique expertise in training and educating students will address Environmental Sustainability Indicators in the Sustainable Research and Teaching Group.

<ul style="list-style-type: none"> <li>Integration of sustainability into courses to promote sustainability literacy           <ul style="list-style-type: none"> <li>27. Number of courses incorporating aspects of sustainability</li> </ul> </li> </ul>	Environmental issues are covered in some courses within specific modules. In other courses they are integrated into the whole curriculum.	All students should have the opportunity to set their specialist learning in the context of sustainable development principals.	2	1	2	<ul style="list-style-type: none"> <li>i. Assess the number of courses incorporating sustainable development themes.</li> <li>ii. Review the number of courses incorporating sustainable development themes.</li> <li>iii. Increase incorporation of sustainability across the curriculum for example by (a) setting assignment 1 of student placement to assess host companies sustainability or by (b) incorporating sustainability as part of the marking scheme for all assignments.</li> </ul> <p>Responsibility: Course Leaders</p>
<ul style="list-style-type: none"> <li>Research and consultancy into sustainable areas           <ul style="list-style-type: none"> <li>28. Number of projects</li> <li>29. Amount of funding</li> <li>30. Consultancy income</li> </ul> </li> </ul>	There are many research and consultancy projects centred on a sustainable theme conducted by staff at HAUC. The number and income generated from these projects is not quantified.	The newly developed QA system should enable all research and consultancy projects with a sustainable theme to be identified. Promotion of HAUC environmental research and consultancy will be promoted through the NRKE, Sustainable Technologies Network and staff at HAUC.	1 1 1	3 3 3	3 3 3	<ul style="list-style-type: none"> <li>i. Quantify number of projects and income generated through sustainable research and consultancy.</li> <li>ii. Monitor number of projects and income generated to allow benchmark for comparison.</li> </ul> <p>Responsibility: QA Manager</p>

#### V. Estate and Farm management:

Environmental Sustainability Indicators within the Estate and Farm Management Group will draw expertise from the areas of working with rural businesses and linking the rural and urban environmental agendas.

<ul style="list-style-type: none"> <li>Sustainable building design and refurbishment</li> </ul> <p>31. Environmental, social and financial impact</p>	In recent years, several College buildings have been refurbished or newly built. Although this has been achieved with sustainable building design in mind, the social, financial and environmental impact has not been quantified.	Continue to develop the College estate with consideration to sustainable design and materials.	2	3	6	<ul style="list-style-type: none"> <li>i. Quantification of the environmental, social and financial impact of refurbished and newly built buildings.</li> <li>ii. Development of project profiles to transfer knowledge regarding sustainable building design to staff, students and visitors.</li> </ul> <p>Responsibility: Estates Manager</p>
<ul style="list-style-type: none"> <li>Procurement</li> </ul> <p>32. Proportion of resources sourced locally</p> <p>33. Proportion of contracts with businesses with an environmental policy</p>	Catering has a local procurement policy.	Source resources locally to minimise transport miles, and promote local economy.	2	3	6	<ul style="list-style-type: none"> <li>i. Quantify proportion of resources sourced locally and number of contracts with environmental policy.</li> <li>ii. Assess whether resources can be sourced more locally. Economics should be considered.</li> </ul> <p>Responsibility: Director of Corporate Affairs</p>

#### VI. Rural community relations

Environmental Sustainability Indicators in the Rural Community Relations Group will draw expertise from the areas of Sustainable Technologies, Training and Educating students, and working with rural businesses.

<ul style="list-style-type: none"> <li>Promotion of diversification opportunities to the rural sector</li> </ul> <p>34. Number of seminars, conferences and training sessions held</p> <p>35. Number and type of businesses helped</p> <p>36. Student projects</p>	HAUC currently promotes rural diversification opportunities through the business clubs and consultancy. This has a knock-on effect by helping businesses, which may then create employment opportunities. Opportunities for student projects and placements are created through out interaction with the rural community.	Continued promotion of rural diversification opportunities. Continued development of student project and placement opportunities. The number of businesses helped and the number of jobs created are difficult indicators to measure unless businesses attending events at HAUC are surveyed.	1	1	1	<ul style="list-style-type: none"> <li>i. Quantification of sustainable development indicators 34 &amp; 35.</li> <li>ii. Use of the new database system to record student project and placement opportunities, number of attendees for HAUC conferences, seminars and training sessions.</li> <li>iii. Work with the local community through the Local Agenda 21 initiative.</li> </ul> <p>Responsibility: Sustainable Technologies Network Manager.</p>
<ul style="list-style-type: none"> <li>Liaison with the local community to increase sustainability.</li> </ul>			2	3	6	

#### Key:

Delivery targets based on priorities and assigned to the end of each relevant Academic Year as follows:

1 = 2008/09; 2 = 2009/10; 3-5 = 2010/11; 5-7 = 2011/12; 7-9 = 2012/13