

West of England Local Enterprise Partnership Workshop

Workshop G

Sector Skills & Competitiveness Statement

Environmental Technology

Definition

1. The Environmental Technology sector comprises companies engaged with materials, devices and techniques used in pollution prevention, reduction or containment. There are three broad market groups:
 - a) Environmental protection
 - b) Clean technologies and processes including renewable energy
 - c) Resource efficiency including recycling.

2. A recent appraisal of Key Business Sectors commissioned by the West of England Partnership identified priority sub-sectors according to their growth potential and the scale of employment in the sub-region. This analysis was hampered by a lack of clear definition in the Standard Industrial Classification (SIC) system. Nevertheless by SIC code, the growth areas are:

452	Building of complete construction and parts thereof
372	Recycling of non-metal waste and scrap
453	Building installation
410	Collection, purification and distribution of water
743	Technical testing and analysis
900	Sewage and refuse disposal, sanitation and similar activities
292	Manufacture of other general-purpose machinery
451	Site preparation

As well as highlighting the importance of recycling, water and waste management to the West of England economy, the codes encompass activity in the production of renewable energy, including marine, solar and wind design and manufacture.

Background

3. There are some key characteristics of the sector:
 - a) It is currently relatively small in terms of direct jobs but it has a great deal of potential for growth
 - b) It is heavily dependent on environmental protection legislation and regulations
 - c) It covers a number of highly innovative sub-sectors striving to bring new products and services to the market
 - d) A large proportion of the workforce is highly skilled

- e) Large companies are more likely to be water utilities, waste management firms and multinational environmental and engineering consultancies
 - f) There are significant overlaps with other sectors including construction, manufacturing and biotechnology
 - g) The changes in technical skills required by the sector will emerge by degrees over the next decade but are already presenting a challenge especially to small and medium-sized businesses.
4. Although still a relatively small sector in its infancy, Environmental Technology represents one of the fastest growing sectors in the West of England. Despite an uncertain economy, the sector is still likely to grow, due to increased legislation, greater research and a general shift towards more sustainable modes of production, development and consumption.
 5. The South West was the first region in the UK to be designated a 'Low Carbon Economic Area' in marine energy and is seeking innovative ways to use the full range of its outstanding natural resources. The region has high levels of wind, wave and tidal energies and the best solar radiation in the UK. It also has extensive woodland for biomass and an ideal environment for growing trees.
 6. Bristol is a leading environmental technology centre and aspires to be designated a European Union Green Capital. The sub-region is home to world-class companies in renewable energy, waste management, recycling, energy control, sustainable transport, environmental consultancy, and specialist services, and hosts more than 300 companies in the sector. The sector is underpinned by the strong presence of a number of global, multi-disciplinary environmental consultancies.
 7. 2006 data indicate that the sector accounted for 6,654 jobs in the sub-region. The West of England contributes 25% of South West GVA and the Environmental Technology sector contributes slightly above this average.
 8. Most of the knowledge-intensive innovative activities are carried out by small consultancies whilst large utilities such as Wessex Water account for a high proportion of the employment. Water and waste management account for nearly two thirds of the jobs in the sub-region.
 9. There are significant clusters of environmental technology businesses located in Avonmouth, Bristol City Centre and Clifton. In 2007, 376 business sites were identified with the largest proportion in Bristol (153) and the lowest in B&NES (51). Some of the smaller firms are dependant upon Wessex Water as a major customer within the sub-region. Other significant customers include DEFRA and WRAP (a major player in reducing waste and recycling).
 10. Other prominent businesses in the West of England include Parsons Brinckerhoff Ltd, Garrad Hassan & Partners, and Wind Prospect.

Outlook

11. The Environmental Technology sector should show above-average growth because of ongoing political and public pressure for energy efficiency, renewable energy sources, reductions in carbon emissions and more sustainable waste processing. For example, there is a very significant challenge in meeting the national target to produce 15% of all energy consumed in transport, heat and power generation by 2020, when only 2-3% is currently produced from renewable sources.
12. Retro-fit energy and waste saving systems and ambient energy harnessing devices are likely to represent a growth area for the sector, whilst adaptation to global warming will drive expenditure in areas such as flooding and sun protection.
13. There are obvious synergies with the Advanced Engineering sector particularly between aerospace and wind energy systems. It is possible that new markets could be developed in batch production and bespoke large installation. This might include the manufacture of systems to harvest renewable energy and conserve resources.
14. There is also opportunity for collaboration with the Food sector so that food and crop waste can be converted into biomass, bio fuels and biogas.
15. Further synergies exist with Microelectronics in the embryonic sectors of smart grids and smart metering.
16. A healthy outlook depends in part on addressing barriers to growth identified by Environmental Technology businesses, including a need for knowledge and innovation support, legislation to facilitate new approaches to waste processing, and the development of a manufacturing base. In common with all other high growth sectors, the availability of skilled staff and the need for training is of great concern to employers.

Local Support Infrastructure

17. Clustering, networking and strong supply chain relationships are key features of the Environmental Technology sector. Knowledge and innovation support is shared between employers, public sector and HEIs.
18. Low Carbon South West (incorporating the former Bristol Environmental Technology Sector BETS) is a trade association and sector partnership between businesses, academia, investors, local authorities, regional and national agencies. It includes a particularly strong representation from the renewable energy sector. The network is active, very well supported, and is closely linked to Bristol Green Capital, the Bristol Partnership, and Invest in Bristol. Supporters include major players such as Bond Pearce (leading environmental lawyers), DPS Global (international locations include China), Triodos Bank (ethical investments in social and environmental projects), and

Garrad Hassan (“the world’s largest” independent renewable energy consultancy).

19. There are a number of Sector Skills Councils which have an impact on the sector, most significantly: ConstructionSkills, Energy & Utility Skills, SEMTA (for science, engineering and manufacturing technologies), Lantra (for the environmental and land based sector) and SummitSkills (for the electro-technical, heating, ventilating, air conditioning, refrigeration and plumbing industries). The Engineering Construction Industry Training Board is also a key stakeholder as the industry’s Sector Skills Body (SSB).
20. Weston College is a founder hub in the National Skills Academy for Environmental Technologies being established by SummitSkills on behalf of the sector. The College will lead a cluster of local training providers in delivering relevant skills and training.
21. Dynamic and forward thinking academic institutions throughout the South West complement the growing business base. Specific centres of expertise in the West of England include:
 - University of the West of England
 - a) Air Quality Management
 - b) Centre for Environment and Planning
 - c) Centre for Research in Environmental Science
 - d) Institute for Sustainability, Health and Environment
 - University of Bristol
 - a) Bristol Centre for Nanoscience and Quantum Information
 - b) Bristol Earthquake and Engineering Laboratory
 - c) Centre for Environmental Flows
 - d) Interface Analysis Centre
 - e) The Water and Environmental Management Research Centre
 - University of Bath
 - a) Centre for Space, Oceanic and Atmospheric Science
 - b) Centre for Sustainable Power Distribution
 - c) Institute for Sustainable Energy and the Environment
 - Bath Spa University
 - a) Geotechnologies
22. Environmental Technology is also a priority sector for the South West Regional Development Agency, Regional Employment and Skills Board and Universities South West. Other regional stakeholders include Regen South West, Low Carbon South West and SW Manufacturing Advisory Service.
23. In addressing skills demand, SWRDA and other partners are investing £2.4 million in an initiative co-ordinated by Universities South West to provide demand-led higher-level skills. Projections of future demand show that there will not be enough people with the right skills for the low carbon industry and the growth must be met largely by training people already in the workplace. The ‘Low Carbon High Skills’ initiative includes design and delivery of new training solutions with both Higher and Further Education Institutions, and

provision for 250 part-funded graduate internships available to businesses. The project is specifically targeted at:

- a) Marine Energy
- b) Non-marine Renewables, e.g. micro-generation
- c) Low Carbon Manufacturing
- d) Civil Nuclear (New-build and Decommissioning)
- e) Renewable Construction

There is however a real concern that sustaining the network through to full commercial autonomy may be at risk from current public sector funding constraints.

Inward Investment

24. It is claimed that since 2005, 4,000 new jobs have been created with gross development worth £250m. 100 hectares of development has been completed in Avonmouth since 2001 and evidence suggests an increasing demand for large sites to accommodate developments of 400,000 sq feet or more.

25. Inward investment enquiries tend to fall into two categories:

- a) Larger proposed investment requiring land and/or industrial B2 use facility, often from the recycling or bio-fuels sector.
- b) Small / serviced office for companies in the consultancy or R&D sub-sectors. Successes have included GHD, an Australian based company located in South Gloucestershire in 2007 and, more recently, Vestas, a firm supported by Bristol City Council that has located in central Bristol.

26. Key strengths that attract investors to the sub-region are:

- Accessibility of Bristol Port
- Transport road links, particularly M4 / M5 connections
- Existing hub of technologies and services
- Doorstep access to sector specialist business services e.g. legal and financial
- R&D strengths and links to university expertise
- Potential for crossover with the Advanced Engineering sector
- A talent pool of high-level skills, for example graduates and experienced engineers leaving the Aerospace sector.

27. A key issue for inward investing (and indigenous) companies is related to the availability of land for development, or revision of planning permissions on existing properties for use by the recycling sector. Although many of the processes relating to this sector are now much cleaner and with less traffic movements than they are perceived to be, there is still some reluctance by developers, planners and communities to look favourably on these applications. Enquiries from companies seeking to develop Combined Heat & Power (CHP) / bio-fuel facilities indicate an interest in locations where the heat produced by the processes can be used by other companies (e.g. for heating). Outside Avonmouth, there is a lack of suitable locations to meet this demand.

Skills Issues

28. The sector needs a range of skills from vocational Level 3 to postgraduate. The needs vary by sub-sector. Many of the skills needed by the sector are not new ones. They are skills whose availability needs to be increased or which need to be applied in new situations or adapted with further training to the sector context.
29. High-level skills are needed in areas such as electrical engineering, quality control, composite materials, hydrodynamic modelling, and specialist structural engineering.
30. Some sub-sectors are relatively immature and the emphasis is still on the need for research and development skills. As many of the businesses are university spin-offs, there is a strong relationship between academia and industry. It is of optimum benefit to both businesses and students that research projects should actively support current industry needs.
31. A demand has been expressed for transferable skills amongst graduate recruits. Whilst some are acquired in the course of study, others appear to need further refinement to be effective in the workplace. Particular emphasis is placed upon teamwork and leadership, commercial awareness, customer relationships, communication, adaptability and flexibility, networking and decision-making.
32. Project management skills are likely to be increasingly in demand by employers recruiting graduate engineers for installation projects. This might be addressed by facilitating the uptake of established qualifications such as Prince2.
33. It is also noted that the engineers who will adapt most successfully to the needs of the developing sector are those with well-honed creative skills. The needs of the sector may be different in 20 years time and the sector needs people with a dynamic attitude to meeting the opportunities and challenges ahead.
34. There is also a pressing need for the development of business skills amongst specialist employees. For example, employers in the West of England have identified a need for training in export and negotiation skills.
35. Vocational skills are required in the installation and maintenance of specific equipment, for example solar panels, wind turbines and marine energy devices.
36. Knowledge transfer is a key success factor for the sector and there may be a skills issue in developing knowledge-sharing partnerships.

Key Challenges

37. The sector is competing with industry as whole for Science, Technology, Engineering and Maths (STEM) graduates.
38. The small size of many businesses presents a challenge to the capacity of the sector to nurture new talent. For example, it is more difficult for SMEs with fewer resources to support undergraduate internships and work experience for younger learners. However this is an excellent way for SMEs to distribute their workload and for the learners to develop transferable skills. It also serves to raise awareness of jobs within the sector and increase the recruitment pool.
39. It is also a challenge to involve smaller employers in developing university course material. The relative cost to them of engaging in the detail of course development makes it prohibitive.
40. There is a need to attract young people to jobs within the sector and preferably influence them in making their study choices at age 14. Possible routes might include a schools awareness programme incorporating case studies and projects, open days, recruitment fairs and competitions. The challenge is in providing resource to plan and deliver these activities.
41. Challenges also occur in influencing the demand for environmental technologies from associated professionals such as architects, builders, estate agents and mortgage lenders. Some may need to be convinced of the value inherent in renewable systems to support long-term. A need has also been identified for accredited training in advising consumers on energy choices.
42. A key challenge to the growth of the sector is restrictive regulation and planning. An area for development is in equipping people with the skills to influence and challenge regulation and planning assumptions. Closely associated are mitigation skills, which calculate the longer-term impact on the environment and avoid the risks of short-termism.
43. A challenge to developing a clear view of skills needs lies in the diversity of the sector and in the multiple divisions of skill need. The evidence base overall is weak and there is evidence of latent demand that is not being clearly articulated by employers. This leads to a lack of provision in a demand-led training model.

Priorities for Action

44. A priority of the West of England Partnership's Skills & Competitiveness Board is to contribute to economic competitiveness by extending and increasing the skill base in higher and intermediate level skills. The Environmental Technology sector is clearly a relatively new and rapidly growing area that would benefit from a high degree of employer engagement,

and collaboration with both Higher and Further Education in developing skills required for growth.

45. The West of England Partnership specifically aims to:

- promote employer support by targeting Government funding for training (currently allocated through the Skills Funding Agency)
- gear Further and Higher Education provision more closely to employer need (including raising the capacity for innovation and enterprise within the workforce).

46. Immediate priorities for action are to:

- a) engage with employers to:
 - help articulate and prioritise their skills needs
 - stimulate demand for and investment in training and education.
- b) distinguish between general skills needed across the whole sector and those specific to each sub-sector.
- c) develop a full range of specialist technical HE and FE provision through joint action between industry and academia:
 - adapt existing HE courses with specialist modules e.g. specialist structural engineering
 - broaden HE courses to include project management, creative, and transferable skills
 - improve the employability element of provision by teaching skills to address mitigation, planning and regulation, and develop wider sector awareness
 - develop FE provision to directly meet skills needs, particularly in construction and manufacturing requirements
 - develop a model of HE / FE crossover to address technical design skills.
- d) identify the research needs of industry and new ways to collaborate with HEIs at a cost affordable to industry. These might include:
 - Knowledge Transfer Partnerships and other knowledge transfer mechanisms
 - Graduate internships, particularly addressing resource barriers for SMEs e.g. supervision time, office space.
- e) tackle recruitment issues in this sector by:
 - promoting careers in engineering at all levels of education to attract STEM graduates
 - supporting small companies in recruitment.
- f) promote local supply chains.

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