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Regional
Observatory

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Environmental technologies skills review: key findings, issues and recommendations

October 2009

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**Regional
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1 Executive Summary

1.1 Headline findings

The region's environmental technologies cluster, which already employs around 74,000 people in almost 4,200 companies, has the potential to be a key driver of growth and source of employment in the future.

While the recession has had an impact on the region's environmental technologies businesses in terms of a reduction in orders and profitability, environmental technologies firms have fared better than many other sectors of the regional economy. The majority of firms expect trading conditions to pick up by the end of 2009 and there is a consensus that medium and longer term prospects for growth are good - both in the UK market and in key export markets such as India, China and the USA.

Significant market opportunities are identified relating to renewable energy technologies, recycling and waste management and clean and waste water management. In turn these developments are driving demand for both specialist technical skills and a range of more generic/transferable skills.

However there is a limited emphasis on R&D and new product development. Investment in R&D is vital if firms are to move into higher value added products, services and markets and fully capitalise on the potential for growth. Strong links between the region's businesses and universities are key to this process.

A substantial proportion of jobs in the cluster require a degree or higher degree. There are still significant job opportunities, nevertheless, for school leavers, non-graduates with appropriate vocational qualifications and those with only basic skills. At the same time the sector's workforce is ageing and a significant number of key staff are likely to retire over the next few years, taking valuable skills and experience with them.

It is vital that the region's environmental technologies firms can access the skills, knowledge and talent they need to capitalise on these market opportunities. However significant numbers of companies indicate gaps in the skill sets of their staff relating to both specialist technical skills and more generic skills such as foreign languages and written and verbal communication. In addition widespread recruitment difficulties and skill shortages across the sector prior to the recession are expected to re-emerge in the recovery and some have persisted through the downturn.

Many of the region's environmental technologies firms are actively investing in training - aiming to develop skills internally rather than through external recruitment. However while there are some notable exceptions the majority of training undertaken is informal and unaccredited and meets specific business needs. Many firms highlight gaps in the availability of training provision that meets these specific needs.

Nevertheless the uptake of apprenticeships by the region's environmental technologies firms compares well with other sectors and some 11% offer Apprenticeships or Advanced Apprenticeships. There may be scope to build on this success in the future.

1.2 Recommendations - how can the demand for skills be met?

The following recommendations were developed by the project board in collaboration with the Cluster Opportunities Group.

1.2.1 Promoting collaboration and networking

In the context of the government's New Industries New Jobs agenda it is recommended that AWM and the environmental technologies cluster continue to work pro-actively to:

- Engage with key companies and universities active in environmental technologies
- Promote greater dialogue between businesses and academics - and a shared language and understanding
- Improve the links with businesses among HEIs involved in pure academic but often 'cutting edge' research
- Ensure that HEIs are up to speed on industry developments - to help them identify high quality, business relevant research projects
- Encourage HEIs to collaborate to develop a 'centre of excellence' for environmental technologies in the region - which is a repository of research, ideas and talent for businesses to access
- Maximize awareness and take up of Index Vouchers which provide funding for businesses to obtain support from HEIs to develop innovative new ideas and ways of working
- Identify good practice case studies to promote the benefits of collaboration

1.2.2 Promoting environmental technologies as a potential career choice

It is recommended that employers and careers information, advice and guidance organisations such as Connexions and the new Adult Careers Service work to promote environmental technologies as a potential career choice, with an emphasis on:

- Effective marketing to raise awareness of opportunities in the sector and ‘building the brand’
- Clearly articulating the range of jobs available and the qualifications, skills and aptitudes required
- Engaging and involving schools to influence young people’s subject choices
- Influencing the commissioning of 16-19 education and training provision - ensuring that environmental technologies is recognised as a growth sector and that the specific labour and skills requirements of businesses are understood
- Identifying examples of environmental technologies businesses that work closely with schools and colleges to promote the sector as a career choice

1.2.3 Developing a ‘fit for purpose’ supply of skills and training

It is recommended that the Sector Skills Councils that are linked to the cluster (for example Energy & Utility Skills, SEMTA, Cogent, Proskills, Construction Skills, and Summit Skills) continue to engage with employers and training providers to develop appropriate National Occupational Standards and Qualifications Curriculum Frameworks with an emphasis on:

- Making sure that these are informed by the findings from this research project relating to businesses’ specific skill needs, gaps and shortages
- Ensuring that employees in the sector are up-skilled to meet the needs of businesses
- The development of a ‘pipeline’ of graduates going through the region’s universities who are acquiring industry-relevant qualifications and skills
- Addressing specific needs and gaps identified by the research such as foreign languages, verbal written and communication skills and specialist technical skills specific to the cluster such as those relating to asbestos and geotechnical activity, engineering, electrical/electronic and control and instrumentation skills and expertise in new and emerging areas such as fuel cells

- Bringing businesses and providers together to identify skills needs and gaps and approaches to collaborative working to develop training that meets business needs

1.2.4 Promoting the uptake of Apprenticeships

It is recommended that the LSC and the new National Apprenticeship Service and appropriate Sector Skills Councils work to build on the hitherto encouraging uptake of Apprenticeships by:

Developing bespoke frameworks that meet the specific needs of the environmental technologies companies

- Developing innovative approaches that combine institution based and work based learning - based on the model developed for Foundation Degrees
- Marketing the benefits of Apprenticeships to employers by developing exemplar case studies and disseminating these across the cluster
- Increasing the uptake of Apprenticeships via group training associations

2 The research approach

The potential contribution environmental technologies such as renewable energy, pollution monitoring and waste management can make to the regional economy is an area of interest to a number of RSP partners, notably, AWM, the LSC and local authorities. The Observatory was commissioned to carry out research to identify:

- The relative importance of these industries to the regional economy and the profile of the workforce by gender, ethnicity, age and qualification attainment
- Key developments in the sector, potential market opportunities and drivers of skills change
- Current and potential labour and skill needs and any gaps and shortages
- Investment in training and upskilling by employers
- The use of publicly funded, private sector and internally run training and any gaps or weaknesses in provision
- Recommendations and actions to address any issues identified

The project has three key phases:

- Phase 1 - a review of secondary sources of data and analysis
- Phase 2 - quantitative survey of businesses
- Phase 3 - qualitative research to include face to face interviews with businesses and the development of case studies

Phase 1 examined intelligence and data from published sources which included:

- A study of emerging markets in the Environmental Industries sector published by DEFRA (November 2006)
- Cluster desk research published by AWM (Summer 2008)
- An occupational and functional map of the UK renewable energy sector published by EU Skills (December 2005)
- A report on emerging markets in the environmental sector published by UK CEED (November 2006)
- The LSC National Employers Skills Survey (2007)
- The ONS Annual Business Inquiry (2003-2006)
- The Labour Force Survey (Q3 2008)

While these secondary sources yielded some useful and informative findings we identified a number of gaps in intelligence. The subsequent two phases of primary research (on-line survey and in-depth interviews) were undertaken to address these. Details are provided below.

Phase 2 consisted of an on-line survey which was sent to 400 companies included in the Enviro Trade Directory (assembled by the AWM Environmental Technologies cluster team). The survey was split into three 3 main sections:

- Workforce profile
- Business conditions
- Employment, skills and training

Phase 3 was contracted out to an external consultant, Labour Market Solutions Ltd, and consisted of a series of 25 in-depth interviews with employers and the development of case studies to obtain information on:

- Trading conditions
- Market opportunities
- Drivers of skill needs and emerging skills needs
- Recruitment difficulties
- Skills gaps in workforce
- Qualifications/experience needed for specific roles
- Investment in training and upskilling

Separate reports detailing the findings from each phase of the research are available from the Observatory's website via the following link
<http://www.wmro.org/standardTemplate.aspx/Home/OurResearch/Businessconomy/Environmentaltechnologinesskillsreview>

3 Key research findings

3.1 The importance of the sector to the regional economy

According to published data in 2007 (latest available figures) just over 30,000 people were employed in just over 1,500 environmental technologies businesses across the West Midlands.¹ The official figures, however, do not include activities such as renewable energy (for example hydro, wave and tidal power) and emerging low carbon activities (for example nuclear energy, energy management, carbon capture and storage and carbon finance) or take account of companies whose main business may be in other areas but are diversifying into environmental technologies. If these activities are included the sector employs around 74,000 people in almost 4,200 companies².

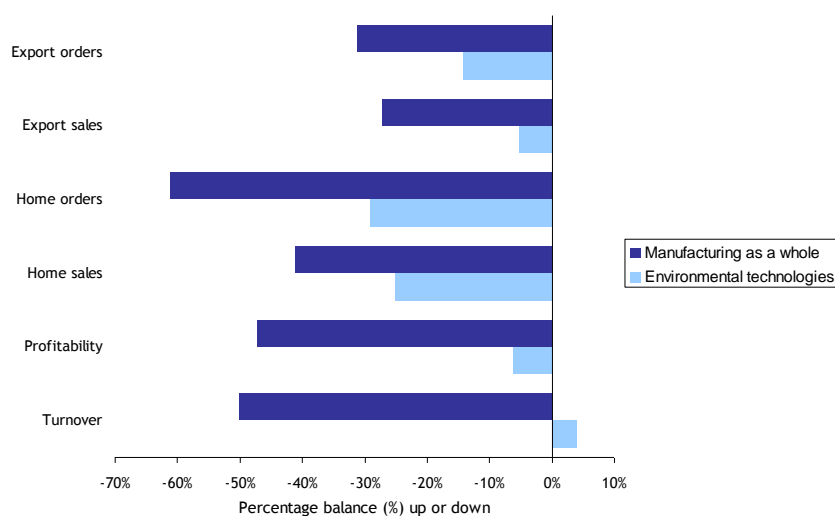
3.2 Recent performance and the impact of the recession

While the recession has had an impact on the region's environmental technologies businesses in terms of a reduction in orders and profitability, environmental technologies firms have fared better than many other sectors of the regional economy. As chart 1 below shows as at March 2009, when our on-line survey was carried out, environmental technologies firms have fared much better than the manufacturing sector as a whole in terms of home sales and orders, export sales and orders, turnover and profitability.

¹ Source: ONS Annual Business Inquiry, 2007

²Low Carbon and Environmental Goods and Services: an industry analysis published by Innovas Solutions Ltd (Commissioned by BERR) on the 9th March 2009

Environmental technologies - impact of the recession: January - March 2009



Source: Source: Source: Observatory environmental technologies e-survey, March 2009

West Midlands Regional Observatory 2009

3.3 The sector's future prospects

The majority of firms expect trading conditions to pick up by the end of 2009 and there is a consensus that medium and longer term prospects for growth are good. In particular significant market opportunities are identified relating to³:

- Renewable energy technologies including combined heat and power projects, biomass boilers and electric vehicles, biogas facilities and large scale renewable energy generation such as wind, solar, wave and tidal power
- Recycling and waste management
- Clean and waste water management
- While the UK market is expected to grow significantly a number of overseas markets with considerable potential are also identified - notably India, China and the USA

³ Source: programme of in-depth employer interviews conducted by Labour Market Solutions Ltd

Selected quotes from in-depth interviews

‘Renewables is still a buoyant market - people are still talking about live and on-going projects’

‘Since March a pickup in orders has been evident, particularly from overseas’

‘Over the last year we have seen our international operations rocket to 40 percent of our order book’

‘We are busier now than we were all of last year’

3.4 Existing and emerging skill needs

A significant proportion of businesses are increasing their employment levels and there is a significant demand for both specialist technical and more generic/transferable skills. In particular there is significant demand for⁴:

- Scientific specialists, operational waste plant specialists, installation skills relating to renewable energy systems and appropriately skilled and qualified energy assessors
- More generic skills such as an ability to combine technical skills and commercial acumen, awareness of environmental technology development globally and a broad based understanding of sustainability issues. There is also a growing demand for staff that are multi-skilled and for staff that can help companies adapt to the implications of climate change

3.5 Skill gaps

It is vital that the region’s environmental technologies firms can access the skills, knowledge and talent they need to capitalise on available market opportunities.

⁴ Source: programme of in-depth employer interviews conducted by Labour Market Solutions Ltd

Other survey evidence suggests that in 2007 nearly 18% of environmental technologies companies highlighted skill gaps in the workforce⁵. Many of these relate to specialist technical skills specific to the cluster such as those relating to asbestos and geotechnical activity, engineering, electrical/electronic and control and instrumentation skills and expertise in new and emerging areas such as fuel cells.

In the in-depth interviews carried out as part of this project companies indicated a range of additional more generic skill deficiencies. In particular these relate to:

- Language skills - which are becoming increasingly important for companies looking to break into non-English speaking markets
- Effective written and verbal communication skills
- Staff who have a wide range of engineering skills

Selected quotes from in-depth interviews

'If we want to become a world player in what is a pretty niche market ... then we have got to start thinking internationally and we can't start assuming that everyone speaks English

'I can find lots of engineers but I can't find many who can write or communicate with people'

'If we could have one wish it would be to have some sort of super engineer who had good skills but also had a very wide ranging (skill set)...an engineering polymath if you like.'

3.6 Recruitment difficulties and skill shortages

There were widespread recruitment difficulties and skill shortages across the cluster prior to the recession, notably relating to mechanical, process, electrical and chemical engineers. While these may re-emerge in the recovery a number of others have persisted through the downturn. These relate to:

- Design engineers and power engineers
- Process engineers with experience in waste treatment
- CAD and software engineers with a good understanding of both current and obsolete systems
- Mechanical, chemical or electrical engineers with at least a second degree or post doctoral qualifications

⁵ Source: LSC National Employer Skills Survey 2007

- Specialist research areas such as fuel cell technology
- Sales and marketing staff with a background in the sector

4 Key issues and recommendations

4.1 How can the sector's demand for skills be met?

If the sector is to fully capitalise on the potential for growth it will be important to ensure that businesses are able to access the skills they need. The Project Board, which includes employers and colleagues from Advantage West Midlands, the Learning and Skills Council and relevant Sector Skills Councils have identified a series of key issues that need to be tackled and have developed some recommendations for action with the Cluster Opportunities Group.

4.1.1 Promoting collaboration and networking

While the region's environmental technologies businesses have performed more strongly than many others in recent years there is a limited emphasis on R&D and new product development. While there are a few notable exceptions there is a widespread reliance on other organisations to undertake this activity, with firms tending to focus on either bringing technology developed elsewhere to the marketplace or improving the efficiency of existing technology.

Investment in R&D is vital if firms are to move into higher value added products, services and markets and fully capitalise on the potential for growth. Strong links between the region's businesses and universities are key to this process and a number of universities in the region have been their capability and expertise in environmental technologies recent years.

However although there are some notable exceptions (for example there are examples of firms working with Birmingham, Aston and Warwick Universities) the majority of businesses have no links with the region's Higher Education Institutions. Many of those that do work with universities tend to look further afield (for example to Imperial, Cranfield, Cardiff and Newcastle).

Selected quotes from in-depth interviews

'It is in our best interests to work with universities because at the end of the day our intake of graduates, researchers and future staff depends on them'

'We have been able to use their technical laboratories, their technical staff, their post graduate and MSc students and so the added value over and beyond the actual sums of the grants has been very substantial'

It is recommended that:

- In the context of the government’s New Industries New Jobs agenda it is recommended that AWM and the environmental technologies cluster continue to work pro-actively to promote collaboration and networking between businesses and the region’s higher education institutions - emulating the success achieved in the digital media cluster. It will be important to utilise existing networks more effectively and to act as an intermediary between businesses and universities to:
 - Promote greater dialogue between businesses and academics - and a shared language and understanding
 - Improve the links with businesses among HEIs involved in pure academic but often ‘cutting edge’ research
 - Ensure that HEIs are up to speed on industry developments - to help them identify high quality, business relevant research projects
 - Encourage HEIs to collaborate to develop a ‘centre of excellence’ for environmental technologies in the region - which is a repository of research, ideas and talent for businesses to access
 - Maximize awareness and take up of Index Vouchers which provide funding for businesses to obtain support from HEIs to develop innovative new ideas and ways of working
 - Identify good practice case studies to promote the benefits of collaboration

Selected quotes from in-depth interviews

‘We are open to any mutually beneficial collaboration - agreements with local industries or universities - that want to get into this market’

‘I would like it if Advantage West Midlands really started to drive innovation in the supply chain’

4.1.2 Promoting environmental technologies as a potential career choice

Some 50% of the region’s environmental technologies firms are looking to increase their employment. A substantial proportion of jobs in the sector require a degree or higher degree. There are still significant job opportunities, nevertheless, for school leavers, non-graduates with appropriate vocational qualifications and those with only basic skills. Although some of the region’s environmental technologies firms are out-sourcing lower value-added activities many others continue to retain them in-house and much of the out-sourcing is to other firms based in the region.

At the same time the sector's workforce is ageing - some 22,000 (30%) are aged over 55 compared with 25% across all sectors. As a result a significant number of key staff are likely to retire over the next few years, taking valuable skills and experience with them.

It is recommended that:

- Employers and careers information, advice and guidance organisations such as Connexions and the new Adult Careers Service work to promote the sector as a potential career choice, with an emphasis on:
 - Effective marketing to raise awareness of opportunities in the sector and 'building the brand'
 - Clearly articulating the range of jobs available and the qualifications, skills and aptitudes required
 - Engaging and involving schools to influence young people's subject choices
 - Influencing the commissioning of 16-19 education and training provision - ensuring that environmental technologies is recognised as a growth sector and that the specific labour and skills requirements of businesses are understood
 - Identifying examples of environmental technologies businesses that work closely with schools and colleges to promote the sector as a career choice

4.1.3 Developing a 'fit for purpose' supply of skills and training

Many of the region's environmental technologies firms are actively investing in training - aiming to develop skills internally rather than through external recruitment. Nearly three quarters provided training for staff over the last year, nearly three quarters are aware of the Government's 'Train to Gain' initiative and 7% are currently involved (which is well above the average for all sectors of 5%). There are examples, for instance of firms that provide both in-house training for their own staff and for those of their customers and suppliers and those that are actively working with providers to develop appropriate training courses.

However while there are some notable exceptions the majority of training undertaken is informal and unaccredited and meets specific business needs. Many firms highlight gaps in the availability of training provision that meets these specific needs (examples include language skills, training in skills relating to the treatment of contaminated land, fuel cells, sustainable development and electrical and electrical control systems courses that are not automotive based)

Selected quotes from in-depth interviews

‘Whether you have been in vocational training or whether you have been to a university it is a very, very different environment from being in a business’

‘We don’t train people for the sake of it ... it’s to solve real problems’

‘The training we give is specific to our products ... not linked in any way to a structured qualification’

‘We would like tailor made courses at a very basic level’

It is recommended that:

- The Sector Skills Councils that are linked to the sector (for example Energy & Utility Skills, SEMTA, Cogent, Proskills, Construction Skills, and Summit Skills) continue to engage with employers and training providers to develop appropriate National Occupational Standards and Qualifications Curriculum Frameworks with an emphasis on:
 - Making sure that these are informed by the findings from this research project relating to businesses’ specific skill needs, gaps and shortages
 - Ensuring that employees in the sector are up-skilled to meet the needs of businesses
 - The development of a ‘pipeline’ of graduates going through the region’s universities who are acquiring industry-relevant qualifications and skills
 - Addressing specific needs and gaps identified by the research such as foreign languages, verbal written and communication skills and specialist technical skills specific to the cluster such as those relating to asbestos and geotechnical activity, engineering, electrical/electronic and control and instrumentation skills and expertise in new and emerging areas such as fuel cells
 - Bringing businesses and providers together to identify skills needs and gaps and approaches to collaborative working to develop training that meets business needs

4.1.4 Promoting the uptake of Apprenticeships

The uptake of apprenticeships by the region’s environmental technologies firms compares well with other sectors. A significant number of environmental technologies firms have a track record of successful involvement and some 11% of offer Apprenticeships or Advanced Apprenticeships. There may be scope to build on this success in the future.

It is recommended that the LSC and the new National Apprenticeship Service and appropriate Sector Skills Councils work to build on this by:

- Developing bespoke frameworks that meet the specific needs of environmental technologies firms
- Bringing businesses and providers together to identify skills needs and gaps and approaches to collaborative working to develop training that meets business needs
- Marketing the benefits of Apprenticeships to employers by developing exemplar case studies and disseminating these across the cluster
- Increasing the uptake of Apprenticeships via group training associations

5 Full document information

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