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### Sustainable Jobs in Sustainable Energy: Closing the Gap

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#### **Abstract:**

*The surge in demand for renewable energy has seen the sector expand in recent years. Evidence of this in the North East is the recent establishment of an R&D centre (New and Renewable Energy Centre – NaREC). However, the North East, even with its strong engineering background, has not had a successful rate of growth due particularly to skill deficiencies (CURDS 2002; GO 2004). This project investigated higher-level skill needs in the sector and gives recommendations on integrating the findings into the University curricula. In particular it recommends change in the area of mechanical and electrical engineering, which covers a wide range of renewable energy employment needs through its HND, degree and Masters programmes.*

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#### **Introduction**

The growing demand for renewable energy has seen the sector expand in recent years, evident in (1) the target set to generate 10% of national energy from renewable sources by 2010 (2) the introduction of an energy tax on non-renewable fuels (Climate Change Levy) and (3) continuing Government commitment through the recent energy White Paper (DTI 2003). Evidence of this in the North East is the recent establishment of the New and Renewable Energy Centre (NaREC) for research and development. As the recent *Energy Cluster Skills Report* (ONE 2004: 14) notes 'the North East is considered to be at the forefront of technological developments within the Renewable Energy sector, generating a need for higher level skills'. A recent survey carried out by the Centre for Urban and Regional Development Studies (CURDS 2002) identified the opportunity to create more than 1,000 renewable energy jobs by 2010 in the region, the majority of which are at the higher, graduate, skills level. However, the report highlights barriers to growth including a lack of institutional support for the sector, poor industrial-academic cooperation and few cross linkages between academic/training and the vocational sector. The recent *North East Energy Cluster Skills Position Statement* (ONE 2004) has highlighted that regional universities are in a unique position to take part in the expansion of the sector by providing vocational and long term learning as well as supplying graduates with the appropriate skills.

#### **Method**

As the sector accounts for a niche market of no more than 15 active SMEs, a sample of 12 of these was chosen, taking account of size and regional composition. An initial questionnaire was sent to employers followed by semi-structured interviews. It was decided early in the project that due to the niche market occupied by the renewable energy sector in the region, it would be more productive to send questionnaires to employers then follow this up with a short interview. This allowed a better insight into views on the nature of skill deficiencies. Employers were asked about a number of issues including skill shortages and graduate employability. In interviews they were also asked about the possibility of developing more formalised links with particular programmes at the university, which would allow the development of a practical framework for curriculum development and promote dialogue with regard to skills, short courses, employability and degree course programmes.

Due to the nature of a small sector and the need to obtain a positive response to questionnaires and interviews, an external consultant with specific expertise and contacts in the sector was engaged. He proved to be a key element in not only the design of the questionnaire but also in establishing contacts in the sector.

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### Skills Shortage In a niche market

The sector is still at an early stage of development and the present skill needs do not reflect predicted future demand. An analogy for the renewable energy sector is the IT sector in the late 1970s and early 1980s before its rapid expansion in the late 1980s.

The energy White Paper (DTI 2003) set a national goal of 10% renewable energy supply by 2010, which will be a catalyst for significant growth in the sector and for the skilled personnel needed. The Electricity Training Association (ETA 2003) argue that the estimated 3,836 people currently employed nationally in the sector will have to rise to 9,748 if the 10% target is to be met with '*growth expected across most categories of skills*'. The emerging issue is that the sector is already beginning to have problems recruiting and retaining skilled staff and '*skill shortages will continue and increase as the sector evolves*' (ONE 2004). The Electricity Training Association Employment and Skills Survey 2003 also went further in its survey identifying employers already experiencing a range of skill shortages. They identified four main areas of need with higher-level skills at a management and professional level prominent.

In anticipating the growing needs of the energy sector One North East and the Learning Skills Council established an Energy Cluster Skills Forum (ECSF) to address energy skills issues and the sector's needs in the region, including identifying renewables as a tool of economic regeneration and investment. The Forum's skills position statement (ONE 2004) revealed that the higher education sector has no single course entirely devoted to renewable energy and that over 50 stakeholders in the energy sector had a lack of job specific training. These findings supported the earlier Electricity Training Association survey (2003) of employers that specified that the sector lacked the necessary training infrastructure to deliver effective training and development programmes.

### Survey findings

The survey findings suggest that there is increased activity in the region with regard to the installation of renewable energy systems, requiring the involvement and recruitment of graduates. The main area of activity here is the installation of wind energy systems but there is also a significant potential for solar, biomass, and photovoltaics. A considerable number (80%) of employers acknowledged the importance of higher education in this but as one suggested, '*universities need to promote the concepts and interests of the renewable energy sector and try and recruit good quality students*'.

However, according to a regional consultant involved in the wind energy sector, his experience leaves him with no doubt that '*there is currently a shortage of people with appropriate backgrounds, particularly regarding a lack of knowledge of electrical machinery*'. A significant majority (87%) of companies supported this view '*there is a clear need for knowledge about the actual hardware not just the theory behind it*'. Civil engineering was further identified as a key discipline required for the construction of wind turbines.

Our findings overwhelmingly (over 80% of interviewees) suggest that employers are looking for graduates from the engineering disciplines to have appropriate interdisciplinary knowledge of broad engineering issues. For example when recruiting a wind turbine engineer, a company not only looks for someone familiar with that area but also someone who has knowledge of other critical non technical factors such as planning, environmental planning assessments and health and safety issues.

This is particularly relevant at present as the market is underdeveloped, with a number of smaller companies dependent on those with entrepreneurial skills. Professionals also have to be flexible enough to overcome the early problems and common barriers associated with a rapidly changing market and the differing circumstances associated with new opportunities.

Larger companies in the survey echoed these requirements noting that new graduates needed to have commercial awareness in addition to understating client requirements. For example, one large employer believed that a University level course tailored to their needs would need to comprise a 75% mix of engineering skills, 15% project management and 10%

on commercial awareness. In addition they noted that work placements, particularly during the final undergraduate year or organised at an MSc level would be beneficial to both the student and employer. It was cited that graduates entering employment have a very clear knowledge of theory but little practical on the job training. These findings are in line with the *Electricity Training Association Employment and Skills Survey* (ETA 2003), which suggested that many graduates have little work experience and unrealistic expectations.

Employers interviewed further highlighted that there is an increasing need for graduates from electrical and mechanical engineering backgrounds to gain experience in differing parts of the renewable sector. Encouraging secondments, work placements and an exchange of ideas can do this. For example, a company involved in wind turbine development, can benefit from the experience of a electrical engineering graduate who has had experience of commissioning wind farm projects and who can give them an insight into the difficulties involved in the commissioning process and assist in improving product design. This not only addresses the needs of graduates but also addresses the research agenda, which tends to be fragmented, and lacking cooperation between the academic-industrial environments (ONE 2004).

The results of our survey strongly support the *North East Energy Cluster Skills Position Statement* (ONE 2004) findings and suggest that there is a willingness on the part of employers to take part in short courses or CPD programmes run by universities if they are priced competitively. The survey also identified a need to develop distance learning to encourage current practitioners in the field, for example local authorities, to find out more about renewable energy issues.

Other smaller companies suggested that one of the barriers in getting involved and engaging in local training courses is the lack of available courses regionally on renewables energy. For example the Open University course on Renewables was cited as the type of course which could attract practitioners from the region if run locally. In addition another factor mentioned for lack of involvement was the perceived poor standards of knowledge of some lecturers in renewable energy topics and the consequential out of date information on some undergraduate courses. It was highlighted that HE needs to address such barriers before it can make a positive contribution to skill development in the sector.

Finally we would agree with the *North East Energy Cluster Skills Position Statement*, which highlighted that some companies are very progressive in terms of training and developing their staff. However we would strongly argue that much of the current sector has a culture of short-term commercially driven decision-making which perpetuates the continued lack of investment in training generally, causing skill shortages to be exasperated. Positive action to change this can be taken by HE, breaking the cycle through developing close links with employers and allowing them to engage in fruitful discussion over changes in the curriculum on a number of levels.

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## Recommendations

This survey provides a small contribution to a growing body of evidence (CURDS 2002; ETA 2003; ONE 2004) that has identified that the energy sector, in particular renewable energy, is facing current and future challenges in the area of skill. A critical factor in this is the role that HE can play in the provision of both the sector's CPD and its newly qualified entrants. Northumbria, with its strong engineering background, can assume a lead role by developing employers links. Below are a number of early steps that can be taken towards this both internally and externally.

### *Internally*

- Renewable employers should be encouraged to participate in curriculum development through, for example, an employers' forum. This will: help develop academic knowledge of renewable energy topics; allow students to develop their employability skills; assist sector skill development; and facilitate greater HE business integration.

- Engineering undergraduates and graduates need to be encouraged to develop their expertise beyond its scientific base. A more interdisciplinary approach should be taken, for example, modules could be offered in project management and business based skills.

**Externally**

- CPD short courses with a renewable energy content are an effective way of providing both training for existing professionals in the sector and developing University business links. Again employer liaison through a forum would assist in identifying areas of interest.
- The University should have a greater involvement in the sector's policy development to complement its current technical and research and development strengths.

**Bibliography**

CURDS (2002) *Learning and skills needs of the new and renewable energy industry in Northumberland*, a survey for Northumberland Learning and Skills Council, October 2002.

DTI (2003) *Our energy future - creating a low carbon economy*, CM5761, The Stationery Office: London.

ETA (2003) *Exploring the Skills Requirements of the UK Renewable Power Industry to 2010*, Electricity Training Association Employment and Skills Survey 2003, Electricity Association.

GO (2004) *Regional Energy Activity Scoping Study*, Government Office North East.

ONE (2004) *North East Energy Cluster Skills Position Statement*, ONE North East and the Learning and Skills Council.