

Sustainable energy and job creation

Briefing note

Relevant to: England, Scotland, Wales and Northern Ireland

Introduction



Image source: © AMEC Wind

Investing in energy efficiency measures or renewable energy technologies will generate employment. This briefing note examines the types of

employment created as well as the reasons why investment in sustainable energy projects creates more employment than investment in many other sectors.

Renewables versus energy efficiency

Renewable energy projects involve the manufacture of generating technologies and the components involved, as well as the installation, operation and maintenance of the plant.

Generating power from renewable energy is generally relatively capital (rather than labour) intensive. However, the potential for export for many technologies (such as wind turbines and photovoltaics) is significant. The majority of jobs created in this sector will be skilled.

In contrast, the manufacture and installation of energy efficiency measures is a labour-intensive sector and many of the jobs created in installation are suitable for the long-term unemployed if the necessary training schemes are set up. In addition to the indirect effects that are common to any scheme involving job creation, energy efficiency schemes also have the benefit of an increased multiplier effect as a result of the increased spending of those who have saved money by having lower fuel bills.

Jobs from energy efficiency



In the late 1990s, the EU funded a major study of the impact of energy efficiency on job creation¹. This study found that there are three main reasons why energy efficiency has positive effects in terms of job creation.

1. Manufacturing and installing energy efficiency measures is a labour intensive sector compared to energy supply and many sectors in which the government chooses to invest public sector funds. This effect accounts for direct employment gains of 10 to 30 person-years of employment per £1 million spent and almost 60 person-years where job creation and training are made a priority.
2. If the energy savings are cost effective, the result is that consumers divert expenditure from energy into the more labour intensive general consumption sector. This effect typically generates an additional 70 person-years of employment in the wider economy per £1 million spent, over the lifetime of the energy saving investment.
3. Work in manufacturing and installing energy efficiency measures is accessible to people who suffer the highest rates of unemployment in the UK, given that it is manual labour and the work is dispersed around the country. Indeed, where programmes aim to assist the fuel poor, the work is concentrated in areas where unemployment tends to be highest. Improving energy efficiency in buildings makes

¹ Association for the Conservation of Energy (2000) Energy efficiency and jobs: UK issues and case studies.

a valuable contribution to urban renovation and creates local jobs that are accessible to those who have lost jobs in manufacturing.

Examples

The same project studied seven UK energy efficiency schemes to ascertain their impact on employment. The results of three are summarised below.

The Home Energy Efficiency Scheme (the



precursor to the current government fuel poverty funding programmes) created 7,800 person-years of blue-collar employment and 840 person-years of white-collar employment over the six years studied. In addition, around 22,000 person-years of indirect employment were created over the 15 year lifespan of

the measures installed. The cost of the direct employment worked out at 24 person-years per £1 million and, of the indirect employment, 61 person years per £1 million.

The Wise Group is an organisation that acts as an 'intermediate labour market' for people who have been in long-term unemployment in Glasgow. The function of the intermediate labour market is to:

- Give the long-term unemployed a period of employment in their own right.
- Keep them in contact with the habits of work.
- Improve their skills to keep them closer to the labour market.
- Prevent them from dropping into the category of being unemployable.

The scheme has been in operation since 1984, with training provided in, amongst other things, the installation of insulation using nationally accredited courses. Over the one year studied, 194 person-years of blue-collar employment were created and 86 person-years of white-collar employment. This worked out at 58 person-years of direct employment per £1 million invested. Further details on the Wise Group can be found in an accompanying Energy Saving Trust case study [here](#)¹.

¹www.energysavingtrust.org.uk/uploads/documents/housingbuildings/sustainable_energy_and_job_creation_wisegroup_cs.pdf

At the local level, an energy efficiency project in **Shetland**, aimed at reducing energy consumption, involved employing an energy manager at the council and promoting a range of energy efficiency measures. The project generated seven person-years of blue collar and seven person-years of white-collar employment, with 19 person-years of employment per £1 million.

Renewables



Realising half the EU's renewable technical potential by 2020 (14 per cent of primary energy demand) could create 515,000 jobs (net, allowing for losses in other energy sectors)². The renewable energy industry consists predominantly of small and medium size enterprises (SMEs), which are recognised as being a major source of new job opportunities in the EU. Furthermore, the impact of renewables developments on employment is, according to some studies, about five times higher than the employment impacts of further development of fossil fuels. For example, a study by the American Wind Energy Association based on a comprehensive survey of wind plant operators in California showed a figure of 460 jobs per terawatt hour per year for operation, support and maintenance, with another 88 to 146 jobs created in manufacture. Coal fired plants only generate 116 jobs per terawatt hour (including mining)³.

Figure 1 illustrates the total number of jobs associated with renewable energy supply, in 2004, by technology for England, Wales and Northern Ireland. The total number of jobs is around 6,000.

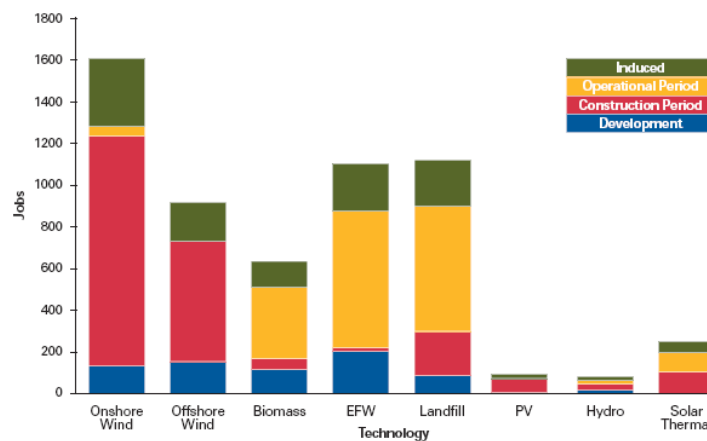
In Scotland, the total is around 2,000, the vast majority of which are in onshore wind.

As the graph shows, the level of employment sustained by the industry varies significantly across the technologies.

² European Commission (1996) Energy for the Future: Renewable Sources of Energy; Green Paper for a Community strategy. COM (96) 576.

³ Quoted in Friends of the Earth (1995) Working Future? Jobs and the Environment, London: Friends of the Earth.

Figure 1 – Total jobs in UK (except Scotland) by technology



Source: DTI (2004), Renewable Supply Chain Gap Analysis

The sections below examine in more detail those technologies considered to have the greatest long-term capacity for employment generation.

Wind energy

Wind energy is the fastest growing energy sector in the UK, creating jobs with every megawatt installed. To date, companies working the wind sector are sustaining over 4,000 jobs and this is projected to increase as the industry grows¹.



Image source: © NEG Micon

Employment in operation and maintenance activities is 16 times greater per unit of electricity generated for wind farms than for Combined Cycle Gas Turbines².

¹ DTI (2004), Renewable Supply Chain Gap Analysis.

² British Wind Energy Association (1997) Employment in the UK Wind Industry, Fact Sheet No.32.

Recent examples of industry growth in the UK include the Vestas (previously NEG Micon) manufacturing facility on the Isle of Wight which employs over 500 people, 420 of whom live on the island, making this company one of the island's largest employers. The German turbine manufacturer DeWind was acquired by UK company FKI in 2002 and employs around 400 people manufacturing complete wind turbines in its plant in Loughborough³. In addition to manufacturing, various other sectors are involved in wind energy development, ranging from environmental consultancy, electrical and civil engineering to financial and legal services.

Scotland is also experiencing a boom in wind power, which is leading to job creation and generating income for Scottish companies and communities. Through new wind turbine production facilities such as the Vestas-Celtic factory in Campbeltown (Argyll) and the reactivated factory at Arnish Yard in Lewis, 200 direct jobs have already been created across Scotland.

The increase in offshore wind development will see further jobs created. The Department of Trade and Industry has estimated that round two of offshore wind developments alone could bring a further

³ BWEA (2004) Briefing sheet, The benefits of wind energy.

20,000 jobs for Britain¹, while a 2004 report by ESD for Greenpeace estimates that offshore wind could generate 76,000 jobs². The North Hoyle Offshore Wind Farm, completed in 2003, is one of the largest offshore wind farms to be built in UK waters. It created around 140 jobs during construction and seven jobs for the lifetime of the project. It was anticipated that approximately 85 per cent of the capital expenditure would be placed with companies based in the UK³.

Biomass

While Scotland is benefiting from job creation in wind power, according to the DTI, it is biomass that offers the greatest potential for job creation of all the renewable technologies. Most technologies create jobs primarily during the construction phase. However, for biomass there is a considerable amount of employment during the operations phase (6.5 jobs per megawatt, compared to around 0.1 for wind and 0.5 for photovoltaics). A switch from traditional food crop production to non-food biomass production can potentially help stall the decline of jobs in agricultural regions. A recent report produced for the Forestry Commission estimates that 59,000 new jobs will flow from the growth of the biomass sector in the UK⁴. Europe-wide, it is estimated that over 300,000 jobs could be created from biomass fuel production by 2020, although this will in part depend on prices across the global market for biomass fuel feedstocks.⁵

Photovoltaics

Photovoltaics (PV) are relatively labour-intensive, with the industry currently sustaining about 85 jobs per megawatt in total and 35 jobs per megawatt after adjustment for import activity. (Other renewable technologies range from six to 22 jobs per megawatt.)

Figure 1 shows that employment generated by PVs in the UK is at present quite small. However, this figure is already rising, with an estimated 580

¹ DTI Press Release (14 July 2003) Hewitt Announces Biggest Ever Expansion in Renewable Energy.

² Energy for Sustainable Development (2004), Offshore wind onshore jobs – a new industry for Britain, a report for Greenpeace.

³ National Wind Power Press Statement (2 October 2002) Major Offshore Wind Farm in UK waters set to go ahead in 2003.

⁴ Centre for Economics and Business Research Ltd (2006), The economic contribution of the forest industries to the UK economy, a report for Confor and the Forestry Commission.

⁵ Energy for Sustainable Development (1997) TERES II Study, for European Commission DG XVII ALTENER programme.

people employed in the PV industry in 2004 according to a report produced for the PV Policy Group⁶. The DTI is hopeful that the coming years will see the development of a strong, competitive and relatively job-rich industry, with much secondary manufacturing based in the UK. The European Photovoltaic Industry Association suggests that employment in the European solar electricity industry could achieve a level of 100,000 jobs by 2010.

Further information

- Energy efficiency and jobs: UK issues and case studies, Association for the Conservation of Energy (2000): www.ukace.org/pubs/reportfo/EST2330.pdf.
- Renewable Supply Chain Gap Analysis, Department of Trade and Industry (2004): www.dti.gov.uk/files/file15401.pdf.

The Energy Saving Trust offers a free enquiries service via our dedicated Practical help team – the team will undertake to answer any query regarding sustainable energy or sustainable road transport within a maximum of three working days.

Abbreviations used

DTI	Department of Trade and Industry
EU	European Union
PV	Photovoltaics
SME	Small and Medium size Enterprises

At the time of publication and to the best of our knowledge, the information contained in this briefing note was correct. This briefing note was first published in March 2005 and updated in July 2007.

Practical help cannot vouch for any of the organisations involved.

Practical help

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⁶ WIP (2006) European Best Practice Report: Improving the European and National Support Systems for Photovoltaics, produced for the PV Policy Group.

