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‘Green’ job estimates: Northern Ireland

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The following paper provides a current estimate of jobs in Northern Ireland’s low carbon and environmental sector and examines a number of studies which assess the potential for job creation in the renewable sector.

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Key Points

The Northern Ireland low-carbon and environmental sector employed 31,714 in 2010/11, equivalent to 3% of total UK employment in the sector. Between 2009/10 and 2010/11 the sector saw a 2.8% increase in employment. The 31,714 figure breakdown as follows:

- The low carbon subsectors accounted 39% of total employment;
- The renewable energy subsectors accounted for 38% of total employment; and,
- The environmental sector accounting for 25% of total employment.

Department of Energy and Climate Change data shows that 887 renewable jobs were created in Northern Ireland between 1 April 2011 and 31 July 2012.

A number of studies which estimate potential jobs growth have been examined in this paper. Each is based on a narrow definition of green jobs. The studies primarily focus on the renewable energy sector, or sub-sectors within it. Due to the use of different methodologies, it has not been possible to aggregate the estimates of each study.

The Carbon Trust estimate the creation of between 8,470 and 33,124 jobs from renewable energy by 2020. These estimates greatly rely on Northern Ireland exploiting opportunities presented by renewable development in European and UK markets.

Action Renewables' 2006 estimates concluded that there was the potential for the creation of 5,653 short-term jobs and 395 long-term jobs (full-time equivalent) between 2006 and 2015, the majority of short-term growth was expected to come from wind development.

The Northern Ireland Renewable Energy Industry Group provides estimates on job creation that are limited to wind energy: they estimate 2,000 additional jobs by 2020, of which 584 will be on-going.

The Department of Employment and Learning/ECROYs report focussed on the skills need in four specific sectors – integrated business technology, offshore energy, bioenergy, and energy storage. The report's central scenario estimates suggest the need for 3,300 additional skills need in these sectors.

Executive Summary

Department of Business, Innovation and Skills (BIS) data shows that total employment in Northern Ireland's low-carbon and environmental sector 31,714 in 2010/11, is equivalent to 3% of total UK employment in the sector.

Overall employment in this sector remained steady for 2007/08, 2008/09 and 2009/10 with any fluctuations measuring at less than one per cent.

Between 2009/10 and 2010/11 the sector saw a 2.8% increase in employment.

Within the broader sector, the low carbon subsectors were the largest employers in 2010/11 accounting 39% of total employment. The renewable energy subsectors accounted for 38% of total employment and with the environmental sector accounting for 25% of total employment.

Department of Energy and Climate Change data shows that 887 renewable jobs were created in Northern Ireland between 1 April 2011 and 31 July 2012.

A number of studies which estimate potential jobs growth have been examined in this paper. It has not been possible to locate a study which provides job creation estimates using the same broad definition of 'green' that is used in the BIS data. Each study examined uses a narrower view of green jobs, often focusing on renewable energy only or, as is the case with one study, a specific technology type.

Due to the use of different methodologies, it has not been possible to aggregate the estimates of each study.

The Carbon Trust's 2008 study concluded in a low case scenario renewable energy development and exploitation of various supply chain opportunities could provide 8,470 in Northern Ireland by 2020. Comparing this to the BIS data suggests that this figure has already been reached.

The Carbon Trust's high-case scenario predicts the creation of 33,124 jobs by 2020.

In both the high and the low case a significant proportion of the job creation predicted is dependent on Northern Ireland companies exploiting opportunities arising from renewable expansion in UK and Europe.

Action Renewables' 2006 estimates concluded that there was the potential for the creation of 5,653 short-term jobs and 395 long-term jobs (full-time equivalent) between 2006 and 2015. The majority of the short-term job creation potential was thought to come from growth in wind energy. The report noted that the tendency towards short-term job creation was typical of capital intensive industries such as renewable energy development.

The Northern Ireland Renewable Energy Industry Group (NIREIG) provides estimates on job creation that are limited to wind energy. Like Action Renewables, NIREIG

concludes that there will be a greater proportion of short-term jobs than on-going jobs: they estimate 2,000 additional jobs by 2020, of which 584 will be on-going. They note, however, that continued renewable expansion beyond 2020 is likely to lead to the creation of further short-term employment.

The Department of Employment and Learning/ECROYs report focussed on the skills need in four specific sectors – integrated building technology, offshore energy, bioenergy, and energy storage. The report's central scenario estimates suggest the need for 3,300 additional skills need in these sectors, which almost doubles current employment (estimated at c.3,900 in 2010).The report assumes, however, that 13.9% of the 3,300 figure (459) will be to replacement demand for those that leave the sectors over the five year period.

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1 Introduction

The following paper provides estimates of the potential number of jobs that could be created through the green economy in Northern Ireland. A number of sources have been used to provide these estimates:

- The Carbon Trust;
- Action Renewables;
- The Northern Ireland Renewables Industry Group; and
- The Department of Employment and Learning (skills estimates, rather than job creation).

The conclusions reached by these reports have been affected by the methodology they use, including, for example, the definition of green jobs used, or, the renewable energy penetration scenario envisaged. As such it has not been possible to aggregate the results of each study.

Before looking at the potential for green jobs in Northern Ireland, the paper will provide a brief overview of the Low Carbon and Environmental market based on the most recent data. This analysis looks at jobs, company numbers and sales. It should be noted that the data used here employs a much broader definition of 'green' – to include environmental, low-carbon and renewable energy industry – than any of the other studies featured in this paper.

2 Current position

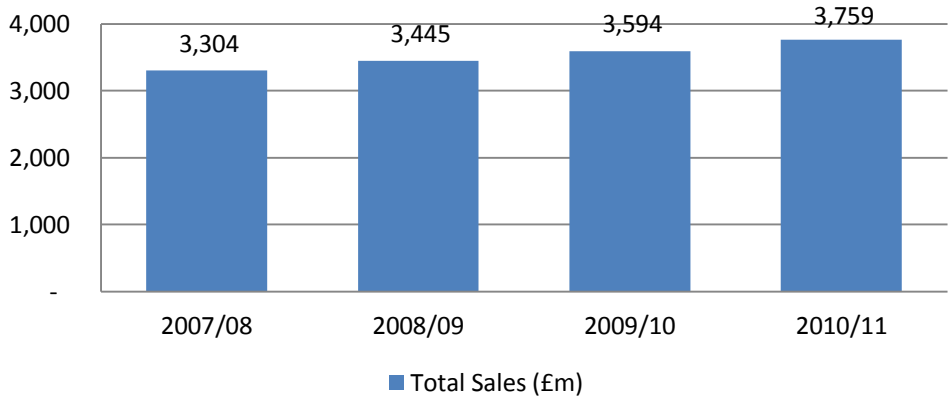
The Department of Business, Innovation and Skills produces the Low Carbon Environmental Goods and Services Report (LGES). The report includes data for employment, sales and company numbers at regional level. Data for twenty-four low-carbon and environmental industry subsectors is included. These sub-sectors fall into three broad categories, as outlined in Figure 1.

Figure 1: LGES Sub-sectors[1]

Environmental	Renewable Energy	Low Carbon
• Air Pollution	• Biomass	• Additional Energy Sources
• Contaminated Land	• Geothermal	• Alternative Fuel/ Vehicle
• Environmental Consultancy	• Hydro	• Alternative Fuels
• Environmental Monitoring	• Photovoltaic	• Building Technologies
• Marine Pollution Control	• Wave & Tidal	• Carbon Capture & Storage
• Noise & Vibration Control	• Wind	• Carbon Finance
• Recovery and Recycling	• Renewable Consulting	• Nuclear Power
• Waste Management		• Energy Management
• Water Supply and Waste Water Treatment		

Yearly totals for Northern Ireland are presented in Figures 2 to 4 for four years from 2007/08 to 2010/11 (the full data set is available at Annex 1). Figure 2 shows that total sales from the sector have increased year-on-year since 2007/08. The latest available data shows that sale in 2010/11 were valued at £3,759m. This was equivalent to 3% of total UK sales. Northern Ireland sales have increased by £455m since 2007/08, a 14% increase. Year-on-year growth averaged at 4.4% over the four year period.[2]

Figure 2: Total sales (£m) NI low carbon industry 2007/08 to 2010/11[3]



Source: BIS

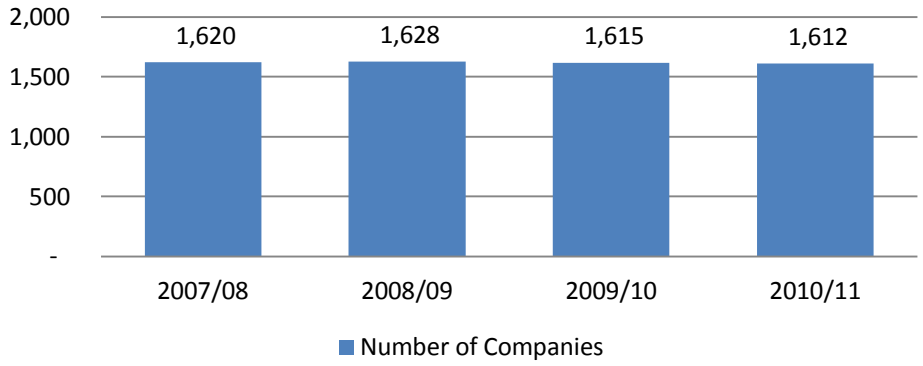
[1] The Department of Business, Innovation and Skills *Low Carbon Environmental Goods and Services Report* (May 2012) http://www.bis.gov.uk/assets/BISCore/business-sectors/docs/l/12-p143-low-carbon-environmental-goods-and-services-2010-11.pdf

[2] 2007/08 to 2008/09: 4.2%, 2008/09 to 2009/10: 4.3% and 2009/10 to 201011: 4.6%

[3] *Ibid*

Figure 3 shows the number of low carbon and environmental companies in Northern Ireland. The number of companies peaked at 1,628 in 2008/09, falling slightly in each subsequent year. In 2010/11 there were 1,612 companies operating in Northern Ireland (equivalent to 3% of the UK total). Between the 2008/09 peak and the latest data, the number of companies in the low carbon sector experience a marginal fall of 0.98%.

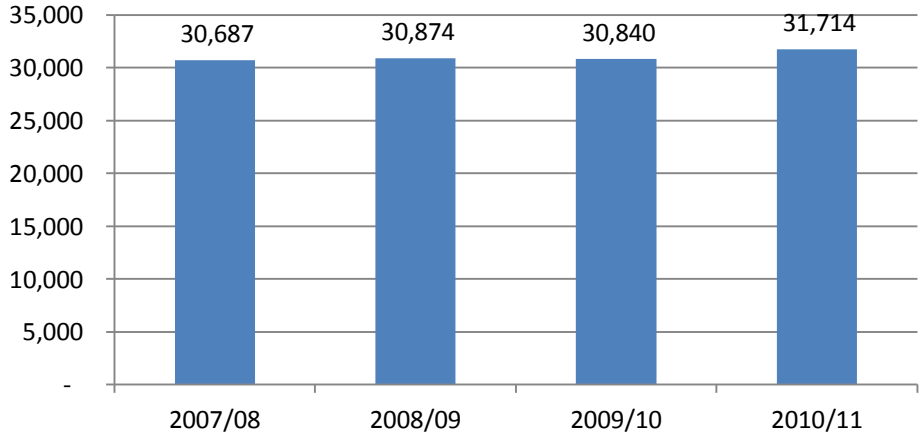
Figure 3: No. of companies NI low carbon industry 2007/08 to 2010/11[4]



Source: BIS

Figure 4 provides details of employment within the Northern Ireland low carbon sector. Despite a fall in employment between 2008/09 and 2009/10 the overall trend is upwards. In 2010/11 total employment in the sector was estimated to 31,714 (3% of the UK total); this represents a 3% increase since 2007/08. Year-on-year percentage changes to employment where as follows: 2007/08 to 2008/09 employment increased by 0.6%; 2008/09 to 2009/10 saw a decrease of 0.1%; and 2009/10 to 2010/11 saw an increase of 2.8%.

Figure 4: Employment in the NI low carbon industry 2007/08 to 2010/11[5]

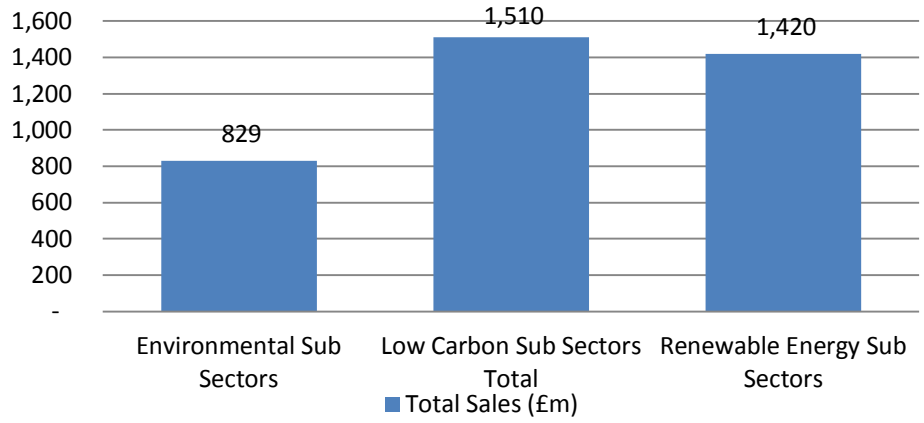


Source: BIS

[4] *Ibid*
[5] *Ibid*

Figures 5 to 7 examine the data for 2010/11 in more detail, providing a sectoral breakdown. Figure 5 looks at total sales. In 2010/11 the largest contributors to total sales within the low carbon and environmental sector were the low carbon subsectors, representing 40% (£1,510m) of total sales (£3,729m). These were closely followed by the renewable energy subsectors (£1420m) which represented 38% of total sales. Within this sector the largest component was alternative fuels, which was valued at £510m (34% of total sales for the subsector). Within the renewable energy subsectors, the largest component was wind energy, which was valued at £574m (40% of total sales in the renewable energy subsector). Wind energy was the largest contributing sector within the renewable energy market in each of the four years (see Annex 1). In 2010/11 this was closely followed by geothermal, which represented 37% of the total sales for the sector and has been the second largest sector in each year. Within the environmental subsector (which contributed 22% to total sales) the largest sector was water supply and waste water treatment which was valued at £212m, or 26% of the subsector sales (£829m).

Figure 5: Total sales by sector 2010/11[6]

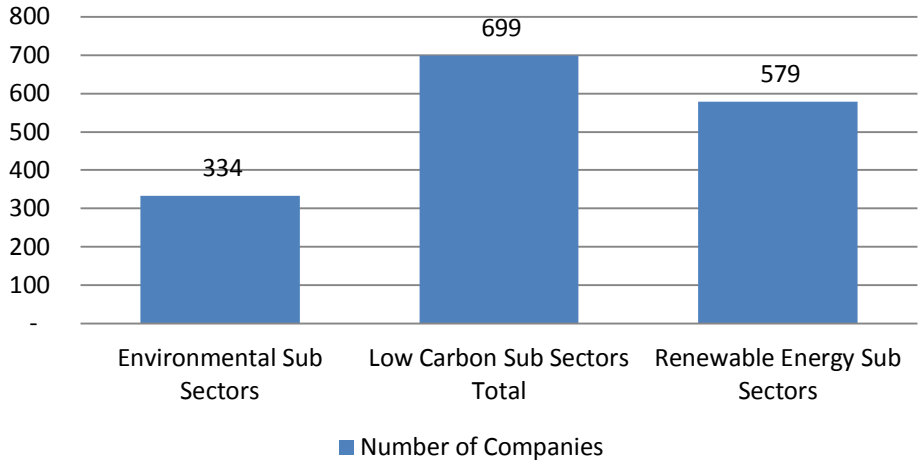


Source: BIS

Figure 6 provides a breakdown of low carbon and environmental companies by sector in 2010/11. Of the three sectors, the low carbon sector was the largest according to this measure. There were a total of 699 low carbon companies in 2010/11, equivalent to 43% of total companies (1,612). The largest subsector within the low carbon sector was alternative fuels. There were 232 of these companies 2010/11, representing 33% of the total sector. There were 579 renewable energy companies in the same year. Of these 224 were in the wind subsector (39%) and 221 were in the geothermal subsector (38%). There were 334 companies in environmental sector, of which 135 were in the waste supply and water treatment sector (40%).

[6] *Ibid*

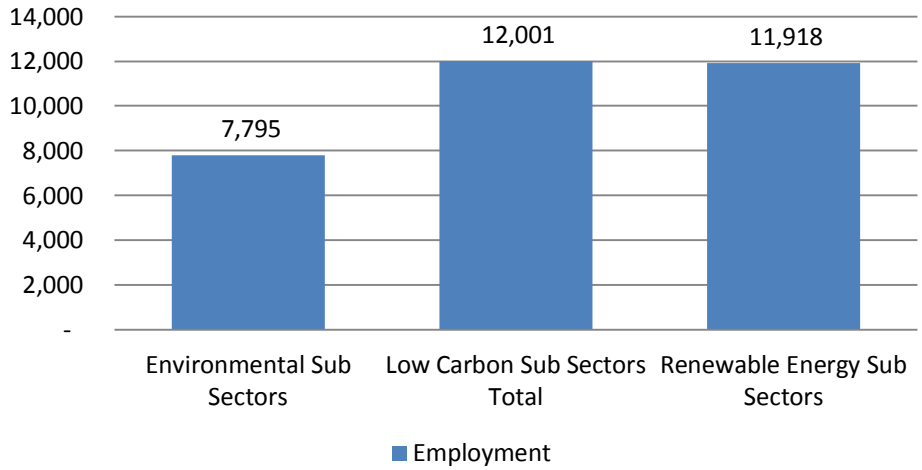
Figure 6: Number of companies by sector 2010/11[7]



Source: BIS

Figure 7 provides a breakdown of employment by sector. The largest sector according to this measure was the low carbon sector, with 12,001 employees, or 39% of total employment. The largest subsector within the low carbon sector was building technologies, which employed 2,998 people in 2010/11 (25% of the sector total). The renewable energy sector employed 11,918 people, or 38% of total employment. The largest subsector was geothermal which employed 4,785 (the largest subsector overall in each of the four years), which represented 40% of the sector total. The wind sub-sector employed 4,061 people, 34% of the sector total. There were 7,795 people employed in the environmental sector, 25% of total employment. The largest subsector here was water supply and waste management which employed 2,580 people (33% of the sector total).

Figure 7: Employment by sector 2010/11[8]



Source: BIS

[7] *Ibid*
[8] *Ibid*

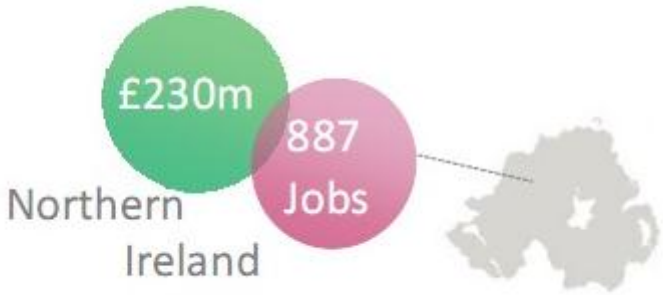
Since April 2011 the Department of Energy and Climate Change has produced a regional map of renewable energy investments and jobs. The data includes manufacturing, construction, engineering and operation, and is sourced from publically available information, including renewable trade publications.

Figure 8 summarises the investment and jobs announcement in Northern Ireland from 1 April 2011 to 31 July 2012 (latest data available). The region saw £230m investment in this period and the creation of 887 jobs.[9] This included:

- Belfast Harbour: DONG Energy £40m tailor-made installation harbour for West of Duddon Sands offshore wind farm. Up to 450 jobs;
- Harland and Wolff: contract for Gwynt y Mor wind farm; provided assembly for Ormonde and Robin Rigg wind farms; won work for tidal turbines. The shipyard is 75% offshore renewables-based;
- Gaelectric: opened new Belfast office, secured approval for £110m wind farm projects, creating 130 construction jobs;
- Powerteam: £3.7m contract from SSE Renewables;
- Creagh Concrete: £1.1m contract from Renewable Energy Generation; and
- Tyrone Energy: £10m CHP plant supporting 30 construction & 7 permanent jobs.[10]

In the period, the UK as a whole saw £6.9bn investment and 20,848 jobs. Yorkshire saw the largest proportion of investment and jobs in this period, £1.9bn and 5,416 respectively. Scotland saw the second highest proportion, £1.7bn and 4,111respectively (further details are available in Annex 2).

Figure 8: Renewable energy investment and jobs in Northern Ireland: 1 April 2011 – 31 July 2012



Source: DECC

[9] Department of Energy and Climate Change *Renewables Investment and Jobs announced 1 April 2011 to 31 July 2012* http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/ored/oredjobs/oredjobs.aspx#

[10] DECC *Renewable energy investment and jobs* (August 2012) http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/renewable-energy/5937-renewables-investment-and-jobs-map-1-april-2011-.pdf

3 Carbon Trust Estimates – 2008

In 2008 the Carbon Trust published a study which sought to:

> *…evaluate the potential and through it the supply chain, for Northern Ireland to become a significant player in the fast growing renewable energy sector both as a creator of products and services and as an exploiter of the available technologies.*[11]

The study included an assessment of the economic benefits and opportunities of renewable energy for the region. It should be noted at this point the focus was very much on the renewable sector, rather than the broader Low Carbon and Environmental sector that the Department of Business, Innovation and Skills produce data examines. Within the study, the renewable sector is defined to include: [12]

- Onshore Wind;
- Offshore Wind;
- Marine;
- Biomass;
- Hydro;
- Solar;
- Geothermal/GSHP;
- Infrastructure; and
- Others.

It also identified a number of phases within the renewable energy supply chain which may lead to the creation of jobs if exploited. These phases were as follows:

- Field Development;
  - Desktop Feasibility;
  - Site Investigation;
  - Options Appraisal;
- Product Design and Development;
  - Research & Development;
  - Specification and Design;
  - Power Operating Environment;
- Product Manufacturing and Assembly;
  - Component/ Device/ Material Manufacture;
  - Device and Systems Assembly;
- Operating Environment and Infrastructure;

[11] Carbon Trust/Roger Tym & Partners *NI Renewable energy supply chain* (June 2008) http://www.foe.co.uk/resource/reports/ct_supply_chain.pdf

[12] *Ibid*

- Site Installation;
- Testing, Certification and Acceptance;
- Operation and Maintenance; and
- Decommissioning.[13]

The report provides estimates potential job creation in Northern Ireland. Jobs creation, the report argues, is not only predicated on the growth of renewable energy, but also upon business' ability to exploit opportunities in the supply chain and in the export market. Specifically, it recommends businesses:

- Be creative in their approach to the low carbon economy and aim at developing new products and service. Manufacturers should also seek to exploit the service opportunities that the low carbon economy presents;
- Act quickly to link into the emerging supply chain and establish a foothold in emerging global markets;
- Identify collaborative partners to help manage risks and expense involved in developing new low carbon products;
- Invest in R&D and skills; and,
- Look beyond current relationships and approaches to markets. For example, manufacturers may wish to consider the role that entering low carbon markets might have on their image and profile.

The Carbon Trust's estimates that, the delivery of 2020 targets leads to the creation of:

- 2.023m jobs due to growth in EU renewable capacity up to 395,240MW;
- 564,000 jobs due to growth in UK renewable capacity up to 51,150MW; and
- 16,000 jobs due to growth in Northern Ireland up to 2,000MW.[14]

The report assumes, however, that only a proportion of these jobs will be captured by the Northern Ireland economy. The report provides higher and lower estimates for the number of jobs captured by the Northern Ireland economy:

- For jobs created through EU renewables growth the report assumes the Northern Ireland economy may capture 1% of jobs in the higher scenario and 0.1% in the lower scenario;
- For jobs created through UK renewables growth the report assumes the Northern Ireland economy may capture 2% of jobs in the higher scenario and 1% in the lower scenario; and,
- For jobs created through Northern Ireland renewables the report assumes the Northern Ireland economy may capture 10% of jobs in the higher scenario and 5% in the lower scenario.[15]

[13] *Ibid*
[14] *Ibid*
[15] *Ibid*

These two scenarios are explored in Table 1. On the jobs question, the Carbon Trust concludes that Northern Ireland could potentially benefit from between 8,470 and 33,124 jobs by 2020 should targets for renewable energy be met. These figures will depend, however, on the aggressiveness of Northern Ireland companies in exploiting the supply chain opportunities that are likely to emerge from the renewables growth. When presenting these figures to the Northern Ireland Assembly Environment Committee in 2009, the Carbon Trust also added that *'these estimates are best considered as a discussion point and in actuality would vary depending on the NI's success in capturing potential opportunities'.*[16]

It should be noted that the higher scenario assumes that 61% of total jobs created will be generated through growth in EU renewables, 34% through growth in the UK, and only 5% from growth in NI renewables. In the lower scenario the break down is different: 24% from EU growth; 67% from UK growth; and 10% from NI growth. In both cases therefore, the results are heavily dependent on the Northern Ireland companies exploiting outside markets.

If the Carbon Trust's figures are compared with the Department for Business, Innovation and Skills outlined in Section 2 it is evident that the 11,918 jobs estimated to have been created in Northern Ireland's renewable sector as of 2010/11 is 40% higher that the Trust's lower estimate for 2020 but only 36% of their higher estimate.

Table 1: Carbon Trust NI job estimates 2020 – high and low scenarios[17]

High Case		Low Case	
Share of jobs in renewables	**Potential employment**	**Share of jobs in renewables**	**Potential employment**
1% of total jobs generated in the EU	20,230	0.1% of total jobs generated in the EU	2,023
2% of total jobs generated in the UK	11,280	1% of total jobs generated in the UK	5,640
10% of total jobs generated in the NI	1,614	5% of total jobs generated in the NI	807
Potential Jobs in NI	33,124	Potential Jobs in NI	8,470

4 Action Renewables - 2006

In 2006 Action Renewables published a study which examined Job Creation Opportunities from Renewables in Northern Ireland. The study focussed on three markets which Northern Ireland could potential benefit from:

- Renewable technology products (manufacture, etc.);

[16] *Ibid*
[17] *Ibid*

- Renewable services (installation, etc.); and
- Fuel production and supply.[18]

A range of technologies were considered:

- Offshore wind;
- Onshore wind;
- Small-scale wind;
- Biomass;
- Waste to energy;
- Solar thermal;
- Photovoltaics;
- Hydro;
- Geothermal; and
- Marine energy.[19]

The job creation estimates are based upon the renewable energy installed capacity figures outlined in Table 2. These figures are adjusted for a range of constraints, including constraints on wind deployment due to grid limitations and public objections. The report states these estimates are *'a more realistic base from which to project job creation potential'.*

[18] Action Renewables/Lagan Consulting *Job Creation Opportunities from Renewables in Northern Ireland* (April 2006)
[19] *Ibid*

Table 2: Action Renewables – Renewable energy installed capacity assumptions 2006-2015[20]

Technology		MW
Wind	Onshore	350
	Offshore	250
Biomass	Willow SRC	7
	Sawmill/forest residue	5
	Agriculture Waste/Poultry Litter	9
	Biofuels (transport)	-
Waste to energy	Landfill gas	15
	Municipal solid waste	13
Solar	Solar thermal	4
	PV	0.5
Hydro	Hydro	2
Geothermal	Geothermal	6
Emerging technologies	Wave/tidal;	10
	Hydrogen	-
	Fuel cells	-
Total		**671.5**

Based on these projections, jobs per MW estimates[21], and assuming an import factor is applied to both MW and jobs per MW[22], the study reached the conclusions outlined in Table 3. The analysis concluded that the renewable deployment between 2006 and 2015 at the levels outlined in Table 2 could potentially lead to the creation of 5,653 short-term and 392 long-term jobs. Of these jobs the majority are expected to come from the wind sector which was estimated to have the potential to create 80% of short-term jobs and 30% of long-term jobs.

On these results the report stated:

> *As in many capital intensive industries, renewable energy development tends to be characterised by substantial short-term employment creation during the construction phase and relatively modest long term employment thereafter. This tendency is more accentuated in the case of large-scale installations (e.g. offshore wind) and less so where there is an agrarian element such as in short-rotation willow coppice biomass or pure plant oil biofuel production…*
>
> *…Nonetheless on top of some 6,000 short-term jobs, it can be expected that renewables sector will contribute some 400 permanent jobs to the Northern Ireland economy. This is a substantial contribution, particularly*

[20] *Ibid*
[21] Based upon DTI's Renewable Supply Chain Gap and the European Commission MITRE project.
[22] That renewable generation growth will lead to job creation in other regions as opposed to NI.

given the decline in traditional industries in the province, including agriculture and across a number of areas of manufacturing. In addition, the jobs created in the renewables industry would be private sector, thereby contributing to the much sought-after rebalancing between Northern Ireland's relatively small enterprise sector and relatively large public sector.[23]

Table 3: Action Renewables – Renewable energy job creation potential[24]

	Estimated job creation	
Technology	**Short-term**	**Long-term**
Onshore wind	2,170	70
Offshore wind	2,400	50
Short-rotation willow	134	49
Sawmill residue	99	36
Poultry litter/agri waste	91	25
Landfill gas	148	74
Municipal Solid waste	218	57
Solar thermal	86	17
PV	17	1
Hydro	158	2
Geothermal	37	5
Wave/Tidal	96	6
Total	**5,653**	**392**

5 Northern Ireland Renewables Industry Group (NIREG) – Wind deployment and job creation

A study carried out by consultants Redpoint for NIREG in January 2012 assessed the Northern Ireland energy market. It included estimates of job creation from wind deployment. Again, as is the case with the other estimates outlined above, NIREG/Redpoint's study was narrow in its focus, in this case wind energy. The conclusions drawn from this analysis were as follows:

- At its peak in 2017, it is estimated that close to 2,000 additional jobs will be created in NI – mostly in planning and construction;
- Once all capacity is installed in 2020, an estimated 584 on-going jobs will have been created in the sector;
- Should renewables deployment continue past 2020, as expected, there would also be on-going planning and construction jobs maintained in the sector;

[23] *Ibid*
[24] *Ibid*

- Using avoided welfare, with a total of 15,505 'job-years' created, the estimated potential benefit to the NI economy over the 2011-20 period will be around £100m in 2011 terms; and
- With 584 on-going jobs created by 2020, enduring benefits of up to £2.3m per annum (NPV, in 2011 terms) are estimated.

It is evident from the above that Redpoint/NIREG concludes that the largest contributor to job creation in the wind sector will be planning and the construction industry. They, like Action Renewables above, suggest that of the jobs created, only a fraction will be on-going jobs (they estimate 29%). The report does suggest, however, that continued expansion of the renewables sector beyond 2020 will lead to the creation of additional jobs above the 584 on-going jobs created up to that point.

6 Department for Employment and Learning: estimate of skills need August 2011

In August 2011 the Department of Employment and Learning published a study which sought to determine the skills required to support potential economic growth in the Northern Ireland sustainable energy sector.

The report, which was completed by ECORYS on behalf of the Department, had two primary objectives:

- To assess the skills required over the next ten years to support the growth of the Sustainable Energy (SE) sector in Northern Ireland; and
- To identify the short, medium and long-term actions needed to ensure that the supply of these skills in NI is sufficient to meet the predicted growth of this sector.[25]

The study did not attempt to provide estimates for the whole *'green economy'* rather it was limited to specific, pre-selected sectors. These were as follows:

- The Integrated Building Technology (IBT) sector, which includes energy efficiency and the integration of renewables into existing buildings. The reasons for inclusion were threefold: the sector is a large energy consumer; a large amount of housing stock requires refurbishment; and the construction sector is a large employer;
- Offshore energy, which includes offshore wind, wave and tidal. The sector is included due to the *'rapid'* development of wind and the *'major future potential'* of wave and tidal.
- Bioenergy, which includes the production and utilisation of solid and liquid biomass for energy purposes. It was included due to the large potential resource and the potential for diversified employment the sector presents; and,
- Energy storage, which includes the development of the smart grid and the potential storage of electricity and other energy forms. [26]

[25] Department of Employment and Learning/ECORYS *Research study to determine the skills required to support potential economic growth in the Northern Ireland sustainable energy sector* (August 2011) http://www.delni.gov.uk/ni_se_final_report_-_pdf_version_-_final.pdf

Table 4 provides an estimate of the turnover and size of these four sectors in 2010, as presented in the DEL report. The table shows that, measured by employment, the IBT sector was the largest, followed by the bio energy sector.

Table 4: 2010 estimate of turnover and size of selected sustainable energy sectors in NI[27]

Sector	Sector GVA (£m)	No. of Companies	Employment
IBT	92.1	634	1,798
Offshore	31.7	94	476
Bio energy	26	239	1,106
Energy Storage	25.6	73	526
Total	175.4	1,040	39,006
Share of NI total (%)	0.92	1.52	0.56

To calculate the estimated skills need, the report outlines three possible growth scenarios up to 2020 – low, central, and high. Each scenario assumes different rates of growth for each of the selected sectors and sub-sectors found within them. These are outlined in Table 5.

Table 5: Annual growth rates in selected sectors and subsector up to 2020[28]

	Annual growth in market size to 2020 (%)		
	Low	Central	High
IBT	5.5	10	15
Offshore - wind	17	27	32
Offshore - wave, tidal	7	26.5	40
Bioenergy - electricity	5.7	6.4	29
Bioenergy - heat	3.9	9.4	22
Bioenergy - transport	6.2	9.5	13.8
Energy storage	3	4	6

Based on ECROYS' modelling, the results of which are outlined in Table 6, the central scenario will require an additional skills requirement of 3,327 between 2011 and 2015. In the high scenario this increases 5,880 and in the low scenario this reduces to 1,809.[29]

Table 6 also shows that in the low and central growth sector the skill demand is expected to second greatest in the IBT sector (followed by offshore), whilst in the high growth scenario it is expected to be greatest in the bio energy sector (followed by IBT and offshore respectively).[30]

[26] *Ibid*
[27] *Ibid*
[28] *Ibid*
[29] *Ibid*
[30] *Ibid*

The main conclusion drawn by the report on this data is that the central estimate of approximately 3,300 implies nearly doubling of 2010 employment in the chosen sectors (3,900 as per Table 4). It should be noted, however, that the report assumes 13.9% of the 3,300 figure will be to replacement demand for those that leave the sectors over the five year period.

It should also be borne in mind that conclusion drawn by the DEL/ECORYS report represents only a proportion of the low carbon and environmental sector considered in Section 2, limited as the analysis is to four sub-sectors. The figure of 3,300 jobs is, for example, equivalent to just 10.4% of the 2010/11 employment in the low carbon and environmental sector as outlined above.

It should be noted that despite focussing on a limited number of subsectors the report identifies a number of concerns in meeting the demand:

- A decline in the number of those pursuing high level mechanical and electrical engineering courses;
- A need for multidisciplinary, skilled workers to meet the crossover of disciplines at all levels. For example, there is a need for ICT and engineering skills cross over in the development of the Smart Grid;
- The possibility that *'current public sector funding constraints will make additional public intervention in funding courses difficult'*; and,
- Any large incoming company will likely need to source many of its initial skill needs from outside NI. To address this it appears 'that the most promising route is to provide a healthy supply of entrants to the labour market with sound Science, Technology, Engineering and Maths (STEM) skills'.[31]

[31] *Ibid*

Table 6: Total skills requirement in selected sustainable energy sectors to 2015[32]

		2011	2012	2013	2014	2015	Total to 2015
IBT	Low	126	133	140	148	156	702
	Central	207	227	250	275	303	1,262
	High	297	341	392	451	519	2,000
Offshore	Low	81	94	109	126	145	554
	Central	133	169	215	272	346	1,134
	High	161	214	284	378	503	1,540
Bio energy	Low	70	73	77	80	84	385
	Central	123	133	145	158	172	731
	High	266	325	398	488	598	2,074
Energy Storage	Low	32	32	33	34	36	167
	Central	37	38	40	41	43	199
	High	47	50	53	56	60	267
Total	Low	309	333	359	388	420	1,809
	Central	499	568	650	747	863	3,327
	High	771	930	1,127	1,373	1,680	5,880

[32] *Ibid*

Annex 1: BIS Low carbon and environmental goods and services: Northern Ireland (2012)

		Total Sales (£m)				Number of Companies				Employment			
Level 1	**Level 2**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
Environmental Sub Sectors	Air Pollution	42	42	43	44	5	5	5	5	503	510	517	533
	Contaminated Land Reclamation & Remediation	18	18	19	19	10	10	10	10	263	265	271	280
	Environmental Consultancy and Related Services	32	33	34	35	3	3	3	3	371	362	373	385
	Environmental Monitoring, Instrumentation and Analysis	6	6	7	7	0	0	0	0	82	85	83	85
	Marine Pollution Control	5	5	5	5	0	0	0	0	51	51	51	53
	Noise & Vibration Control	10	10	10	11	0	0	0	0	124	121	119	123
	Recovery and Recycling	187	193	199	206	78	77	80	80	1,788	1,853	1,823	1877
	Waste Management	196	201	206	212	101	102	102	101	1,821	1,810	1,829	1879
	Water Supply and Waste Water Treatment	276	280	285	290	134	133	134	135	2,452	2,466	2,511	2580
Low Carbon Sub Sectors	Additional Energy Sources	35	36	38	39	25	25	25	25	345	337	348.14	349
	Alternative Fuel Vehicle	417	432	425	442	217	208	199	194	3,603	3,631	3,298	3397
	Alternative Fuels	417	438	483	510	207	225	232	234	3,646	3,540	3,590	3678
	Nuclear Power	50	51	53	54	31	31	32	32	473	462	489	491
	Building Technologies	314	328	343	359	163	167	162	161	2,964	2,926	2,918	2998
	Carbon Capture & Storage	11	12	12	12	7	7	7	7	164	170	169	169
	Carbon Finance	5	5	6	6	1	1	1	1	25	27	26	26
	Energy Management	80	83	85	88	45	45	45	45	890	881	865	893

		Total Sales (£m)				Number of Companies				Employment			
Level 1	**Level 2**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
Renewable Energy Sub Sectors	Biomass	111	115	120	126	46	46	46	46	1,161	1,144	1,201	1250
	Geothermal	460	481	503	528	239	239	221	221	4,456	4,715	4,643	4785
	Hydro	20	20	21	21	9	9	9	9	254	255	273	280
	Photovoltaic	132	140	148	157	70	71	70	70	1,301	1,289	1,340	1388
	Renewable consulting	11	11	11	12	9	9	9	9	129	136	136	135
	Wave & Tidal	2	2	2	2	0	0	0	0	12	13	18	19
	Wind	469	501	535	574	220	215	223	224	3,809	3,825	3,949	4061
Environmental Sub Sectors		770	789	808	829	331	330	334	334	7,455	7,523	7,577	7,795
Low Carbon Sub Sectors Total		1,329	1,385	1,445	1,510	696	709	703	699	12,110	11,974	11,703	12,001
Renewable Energy Sub Sectors		1,205	1,271	1,341	1,420	593	589	578	579	11,122	11,377	11,560	11,918
Total		3,304	3,445	3,594	3,759	1,620	1,628	1,615	1,612	30,687	30,874	30,840	31,714

Annex 2: DECC Renewables Investment and Jobs (UK)