energy review | 2009

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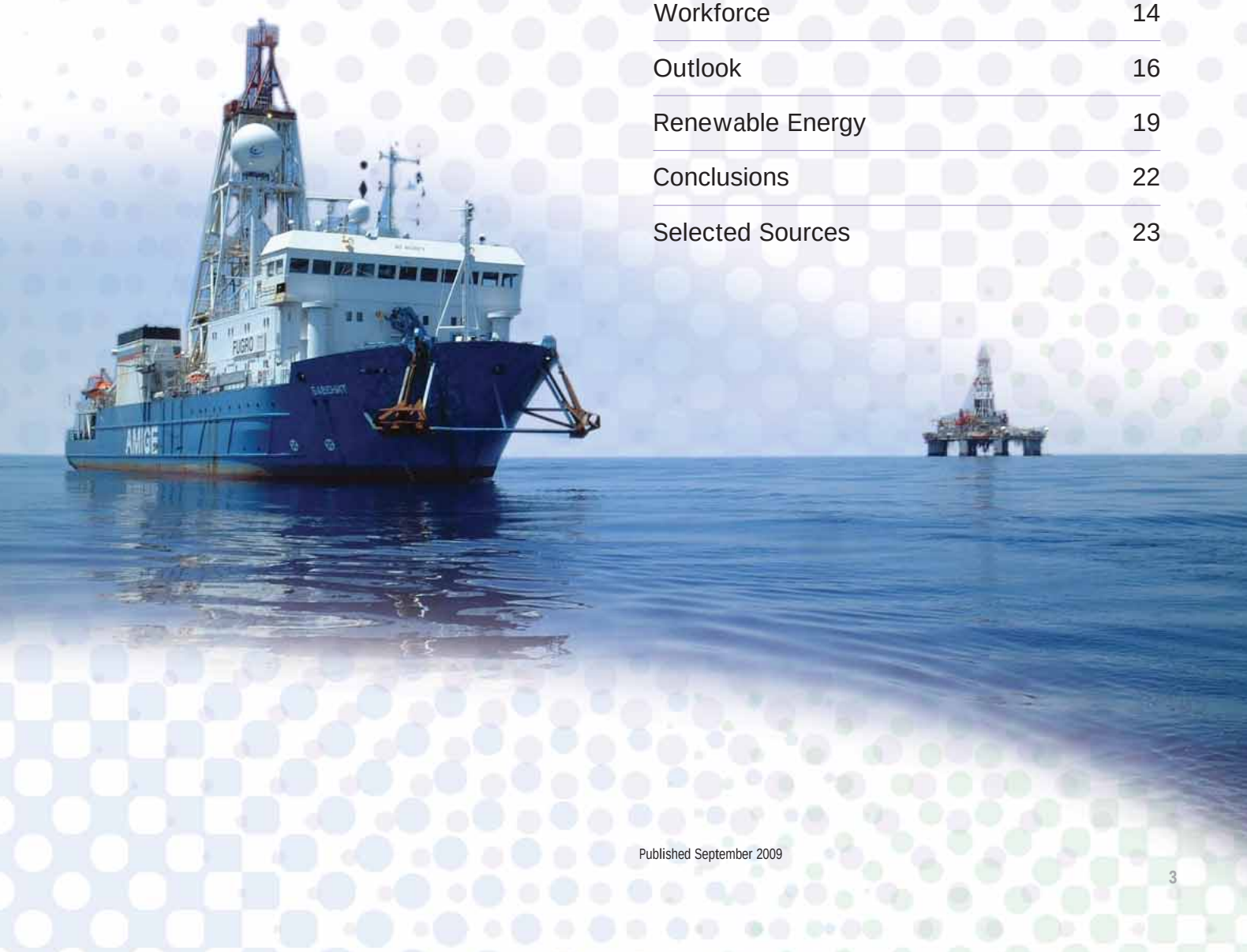

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CHAPTER 1 - Introduction

This report summarises the key activities and developments that have taken place in the energy sector in the Aberdeen City and Shire area over the last two years. The report examines how a range of factors, including the current economic climate, is affecting the sector and looks ahead at the prospects for the foreseeable future. Information from several sources has been used to create a non-technical and accessible guide that highlights the industry's importance to Aberdeen City and Shire.

Context

The first significant oil development on the UK Continental Shelf (UKCS) was in 1975 when the Argyll field operated by Hamilton Bros came on stream. Since then around 38 billion barrels of oil equivalent (boe) have been produced from the UKCS and oil companies have paid over £270 billion in tax revenues. Although the UKCS is now a mature province with declining production and prospectivity, it is predicted that there is still 15 - 25 billion boe that could potentially be extracted.

The UK is the fourteenth largest combined oil and gas producer in the world and the second largest in Europe, after Norway. The UKCS is a major centre of oil and gas production, with Aberdeen the Energy Capital of Europe. The city is especially recognised as a centre of excellence in the subsea sector. Global production from subsea wells is set to grow rapidly with an increasing requirement for the types of service that have been successfully developed in and around Aberdeen.

The last decade has also seen the diversification of the energy sector from traditional fossil fuels into renewable energy sources. The Scottish Government recently announced that 50% of electricity and 11% of heat should come from renewable sources by 2020. Aberdeen City and Shire is already leading the way in developing UK renewable energy technologies and aims to position itself at the forefront of this emerging energy sector.

When an earlier version of this report was published in 2007, the high oil price had stimulated drilling activity, and employment in the oil and gas sector had risen. The last 12 months have brought new challenges. The current global economic situation and volatile oil prices have led to reduced activity, particularly in exploration and drilling which may impact future production.

Importance of the Energy Sector to Aberdeen City and Shire

It is estimated that almost 40,000 people are directly employed in Aberdeen City and Shire's energy sector, with the majority being residents of the area. The economic benefits arising from the spending power of these employees alone makes a huge contribution to the local economy; however, the importance of the sector goes much wider and affects almost every facet of the economic life of Aberdeen City and Shire.

The importance of Aberdeen City and Shire's energy sector should be put in context. In proportion to the total population, an industrial sector employing around 40,000 people here is equivalent to one employing 630,000 in London.

The following examples show how the energy sector contributes to the wealth of the area and helps to maintain a high level of activity in other sectors:

- Gross Domestic Product: the GDP of Aberdeen City and Shire is around £10.5 billion a year. The area has one of the highest GDP per head ratios in the UK and the European Union.
- Retailing: revenues from the energy industry have helped to make Aberdeen an important retailing centre, with a major new retail development opening in autumn 2009.
- Transport: energy-related traffic has helped to boost activity levels at Aberdeen Airport and Aberdeen Harbour.
- Property: the local property market has been relatively stable during the current economic situation when compared with other parts of the UK.

CHAPTER 2 - Industry Structure

Asset Sales

One of the key features of the UKCS energy sector in the late 1990s/ early 2000s was the transfer of assets from well established 'supermajors' to exploration and production companies, mainly from North America, who were new to the North Sea. There have been fewer of these transactions in recent years; due mainly to the high oil price and the 'credit crunch', which have made it more difficult for new companies to become established in the UKCS. Despite that, there have been some significant developments over the past two years:

- In June 2007, Shell and partner Esso announced they were selling some of their older and relatively high-cost North Sea assets.
- In December 2007, Shell/Esso sold their controlling interests in the Dunlin cluster to Fairfield Energy and Mitsubishi Corporation of Japan.
- In December 2008, TAQA Bratani Limited announced that they had acquired oil fields from Shell/Esso including Cormorant South, Cormorant North, Tern, Eider, Kestrel and Pelican.
- In December 2008, BP and BG agreed to exchange a package of North Sea assets. The deal is expected to be completed by summer 2009 and assets will be exchanged without any cash payment.

The current economic climate has led to more restricted access to capital. Smaller exploration and production companies that relied on raising capital to finance exploration spending are potentially less sustainable in the current economic climate. Consequently, there may be an increase in consolidations and mergers in the future.

Company News and Developments

In addition to the above asset sales, there have been a number of other important company developments in the Aberdeen City and Shire area.

Halliburton – In July 2009, Halliburton opened new headquarters in Dyce to cover North Sea operations. It houses 500 staff who previously worked at separate locations.

Oilexco - In January 2009, Oilexco North Sea went into administration. The company operated several UKCS fields including Brenda, Nicol and Shelley. Oilexco and its field assets were acquired by Premier Oil.

BP – In 2008, BP opened its new £60 million headquarters in Dyce.

Technip – In summer 2008, Technip expanded to a second site to accommodate a growing workforce of 800 employees. Both sites are located in Westhill.

Subsea7 – A new £30 million campus is now complete; 850 staff will be relocated from three existing sites into the new campus in Westhill.

Acergy – In November 2008, Acergy relocated staff to its new 17 acre campus in Westhill. The new campus has the capacity to house up to 800 members of staff.

Aker Offshore Partners Ltd – In July 2009, Aker confirmed a 10 year lease at new premises within Aberdeen City to accommodate 300 staff.

GDF Suez – The French energy group have committed to opening a £6 million exploration and production hub in Aberdeen, a move expected to create 80 jobs over the next year.

Overseas Activity

As well as being the main centre for UKCS activities, Aberdeen is also an important hub for international operations. This can be seen in the annual Scottish Council of Development and Industry (SCDI) survey of international activity in the oil and gas sector, which is commissioned by Scottish Enterprise. The most recent SE/SCDI survey was published in February 2009. Although the survey covers oil and gas exports for Scotland as a whole, the findings are very relevant to the North East where most of Scotland's oil and gas services and supply firms are located.

The SE/SCDI survey valued direct exports from Scottish based operations at £2,345 million, an increase of almost 30% from 2006. Direct exports include production and services that are supplied and managed from Scotland. The survey also looked at international sales that were generated via overseas subsidiaries with Scottish based headquarters – sales in this sector rose to £3,350 million in 2007, an increase of 13.2% on 2006. In total, internationally derived sales from the Scottish oil and gas sector industry in 2007 were £5,695 million – see Figure 1.

Figure 1 – Oil and Gas International Sales, Scotland

ACTIVITY	2005 (£M)	2006 (£M)	2007 (£M)
Direct Exports	1,898	1,806	2,345
Sales via Subsidiaries	1,856	2,958	3,350
Total International Activity	3,754	4,764	5,695

Source: Scottish Enterprise (SE) and Scottish Council for Development and Industry (SCDI)

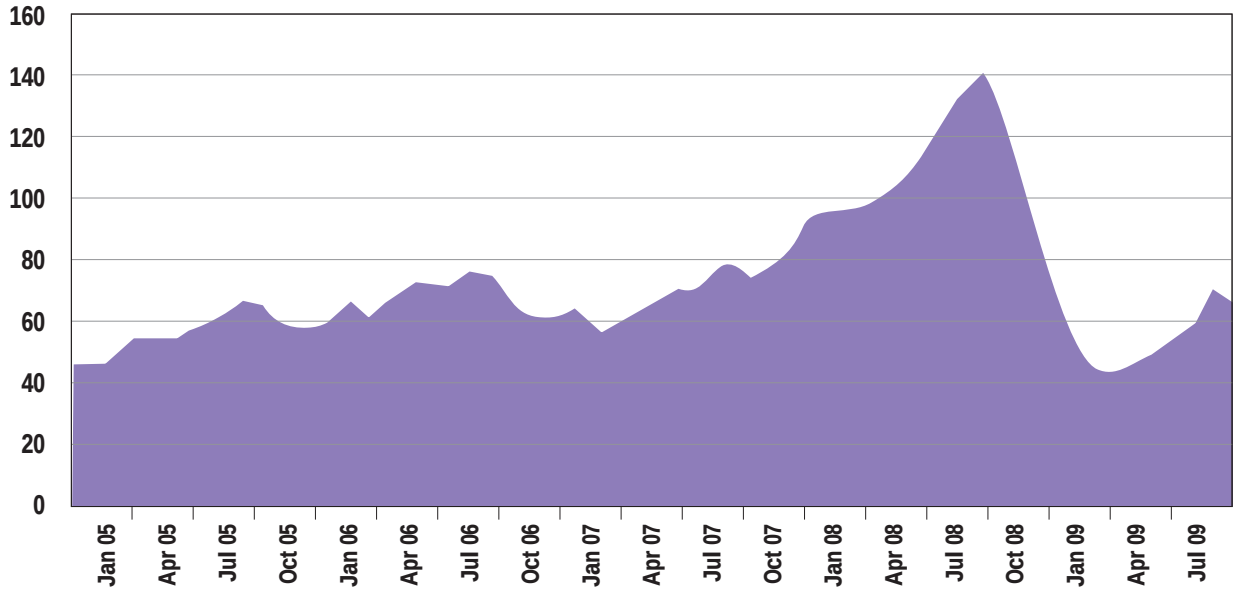
In 2008, Aberdeen City and Aberdeenshire Councils carried out an Export Survey which collected data on current exporting activities and future exporting intentions of companies in the Aberdeen City and Shire area. The main markets for Scottish oil and gas international activity were identified as Norway, USA and The Netherlands. When asked to identify which three countries were the most important markets in terms of turnover, the report identifies the USA as the most important, followed by Norway and the UAE.

CHAPTER 3 - Price and Production

Oil Price

There was a sharp rise in oil prices during 2007, with an average of $73 per barrel. The situation in 2008 was more volatile. Prices averaged $97 over the year but fluctuated significantly, peaking at $147 per barrel in July and dipping to below $34 by the end of December. At the start of 2009, oil prices were sitting at between $40-50 per barrel, increasing to $64 in July 2009 – see Figure 2.

Figure 2 – Oil Price ($ per barrel), January 2005 – July 2009



Source: RBS Oil and Gas Index Jan 2003 – July 2007/ Aug 2007 – present EIA (www.eia.doe.gov)

The drop in oil prices was primarily due to falling demand, which resulted from the severe downturn that was experienced by the world's major economies. Over the coming months, this situation is expected to ease as these economies begin to stabilise and industrial production begins to rise to meet growing demand.

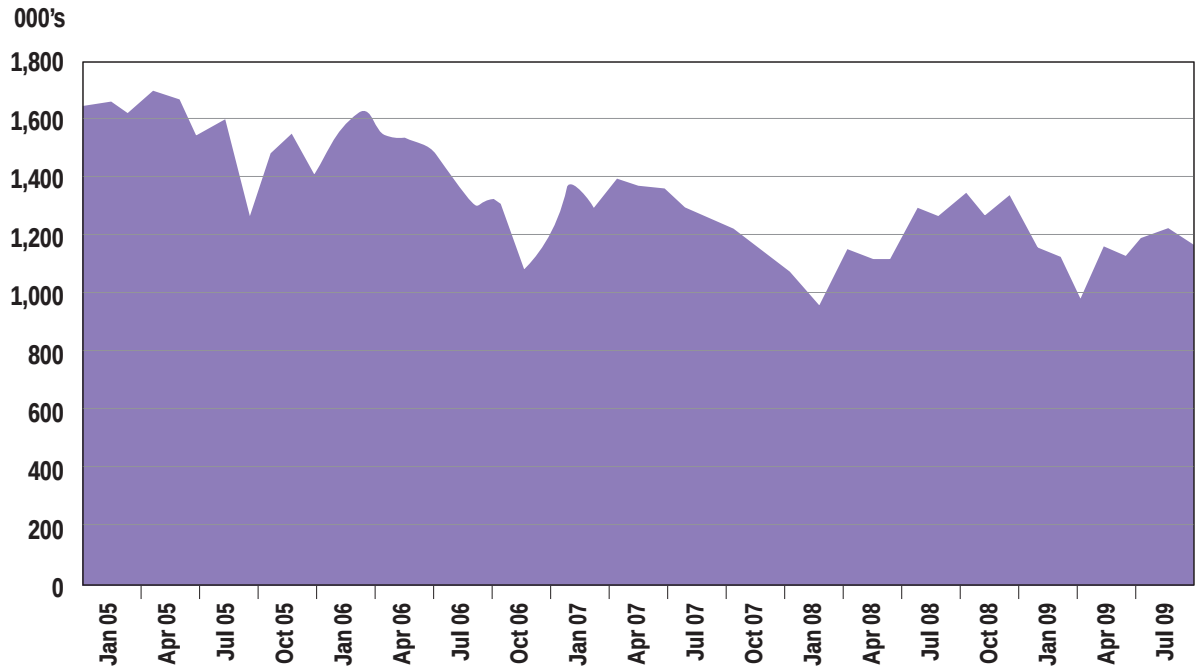
Oil Production

The UK is the nineteenth largest oil producer in the world but UKCS production has been declining in recent years as the province matures and discoveries are smaller.

UKCS oil production in 2007 was 583 million barrels. This exceeded UK consumption by 8 million barrels. In 2008, UKCS oil production fell to 549 million barrels, which was almost enough to cover all UK domestic consumption. Current forecasts predict this decline in production will continue at approximately 5-6% a year for the next four years.

It is predicted that the UKCS should still be able to meet approximately 40% of the nation's oil demand by 2020.

Figure 3 – Oil Production, January 2005 – January 2009



Source: RBS Oil and Gas Index Jan 2003 – March 2007/ April 2007 – January 2009 https://www.og.berr.gov.uk/information/

An effect of declining production combined with an increase in operating costs in the UKCS means unit operating costs have risen by 10-15% to around $13.5/boe in 2008. This compares with $5-6/boe in 2003 and $9-10/boe in 2006.

Gas

The UK is the tenth largest gas producer in the world and the second largest in Europe, after Norway. Natural gas is the UK's largest source of primary energy supplying around 40% of the country's total energy needs. In 2008, the UKCS satisfied 73% of the UK's total gas demands. Although the greatest concentrations are found in the Southern sector of the North Sea, significant volumes are also produced in Central and Northern sectors.

UKCS gas production peaked in 2000 and is now slowly declining. In 2007, approximately 70 billion cubic metres of gas were produced from the UKCS, a reduction of 12% from 2006. In 2008, 68 billion cubic metres of gas were produced. It is predicted that an increasing proportion of the UK's future demand for gas will have to be met from imports. The 2008 Energy Act indicates that imports may potentially account for 80% of our gas needs by 2020.

Gas prices averaged at 58p per therm in 2008, peaking at 76p per therm in September.

CHAPTER 4 - Fields

Field Approvals

In 2008, the Department of Energy and Climate Change (DECC) granted field approval to seven new fields. These are relatively small fields that will use existing infrastructure. The majority of future discoveries and approvals will also be small, reflecting the maturity of the UKCS.

Figure 4 – New Field Approvals, 2008

FIELD NAME	BLOCK	OPERATOR AT TIME OF APPROVAL	TYPE OF FIELD
Boa (UK)	9/15a	Maersk	Oil
Don South West	211/18a	Petrofac	Oil
West Don	211/18	Petrofac	Oil
Grouse	21/19	Venture	Oil
Shelley	22/2b	Oilexco	Oil
Lochranza	15/20a	Maersk	Oil
Jacky	12/21c	Ithaca	Oil

Source: DECC

To date, a further 2 fields were given approval in 2009.

Figure 5 – New Field Approvals, 2009

FIELD NAME	BLOCK	OPERATOR AT TIME OF APPROVAL	TYPE OF FIELD
Auk North	30/16	Talisman	Oil
Bardolino	22/13a	Shell	Oil

Source: DECC

Production from the West Don field commenced on 28 April 2009. This was less than a year after receiving government approval. West Don was developed with the nearby Don South West field which went on stream in July 2009. Peak production from both fields is expected to reach approximately 40,000 barrels of oil per day (bopd). Production from the Grouse field commenced in December 2008. The field was developed via a single subsea production well tied back to the Kittiwake platform and is producing approximately 5,000 bopd. Jacky started production on the 6 April 2009 and is currently flowing at a rate of around 8,800 bopd. Following Oilexco going into administration, Premier Oil now operate the Shelley field. In August 2009, Premier announced first oil from the field which is believed to have approximately 4.3 million barrels of recoverable reserves.

In total, 17 new fields came on stream in 2008 bringing 475 million boe into production with two thirds of all new fields operating via a subsea tieback.

Drilling

In 2007, exploration and appraisal (E&A) drilling activity increased to rates not seen since the mid 1990s. There was a steady rise in E&A wells between 2004 and 2008 led by increased oil prices and access to capital. This rise was also aided by the Fallow process and availability of Promote and Frontier licences. The Central North Sea continued to have the highest E&A activity in the UKCS. Exploration activity remained relatively stable, with the majority of the increase in appraising existing discoveries.

2008 reported strong activity in both exploration and appraisal, but not to the levels experienced in 2007. DECC (Department of Energy and Climate Change) statistics report 86 E&A wells being drilled in 2008, similar to the number seen in 2007. Overall, the technical success rate of E&A drilling was reported at 30% for 2008.

The forecast for 2009 is reported to be less optimistic. The current economic climate and uncertainty over oil prices has led to limited investment in new oil fields. The Oil and Gas UK 2008 Activity Survey estimates that E&A activity could be less than half that reported in 2008. They suggest that companies are shifting resources to focus on exploration in order to fulfil licence obligations and delaying appraisal activity.

Figure 6 – Offshore Exploration & Appraisal (E&A) Wells

SECTOR	2004	2005	2006	2007	2008	2009 Q1
Central North Sea	22	41	36	74	48	10
Northern North Sea	26	20	11	16	32	2
West of Shetland	5	1	7	6	6	0
All Northern Sectors	53	62	54	96	86	12
Other Sectors	10	16	16	15	19	3
All Areas	63	78	70	111	105	15

Source: DECC

Deloitte's North West Europe Review published in April 2009 reports that exploration is down by 78% in the UKCS - although the same number of appraisal wells were spudded during the first quarter of 2009 compared with the year before. In the second quarter, there were 15 exploration and appraisal wells spudded between April and the end of June 2009 in the UKCS. This is a 57% decrease on the same quarter last year and a further 17% fall on the first quarter figures.

2008 saw a slight rise in the number of offshore development wells from 2007, up to 149 from 134 in the Northern sectors. Activity was highest in the Central North Sea, although there was also a significant level of activity in the Northern sector. Looking at the longer term trend, development drilling is still much lower than its 2005 peak when a total of 230 wells were drilled.

Figure 7 – Offshore Development Wells

SECTOR	2004	2005	2006	2007	2008	2009 Q1
Central North Sea	96	120	93	101	83	15
Northern North Sea	52	59	69	27	55	7
West of Shetland	6	17	12	6	11	4
All Northern Sectors	154	196	174	134	149	26
Other Sectors	13	34	27	31	21	5
All Areas	167	230	201	165	170	31

Source: DECC

Remaining Reserves

Approximately 38 billion barrels of oil equivalent (boe) have been produced from UK offshore areas in the last forty years. It is estimated that there is potential for a further 15 - 25 billion boe to be produced but the actual level of future production will depend on a number of factors, for example:

- Costs of exploration, appraisal and development;
- Oil and gas prices;
- Size of fields;
- Costs of access to infrastructure and technology; and
- The tax regime.

The most significant remaining areas of prospectivity in the UKCS are in the area to the West of Shetland and the Hebrides, which is estimated to hold potentially 3-4 billion boe. This equates to around 17% of the UKCS oil reserves and 15% of the remaining gas reserves. Due to difficult weather conditions and lack of infrastructure, these reserves are difficult to access. In June 2009, the Energy and Climate Change Select Committee recommended that Ministers and industry work together to agree a timetable for development of these fields.

As reserves become more difficult to access, there will be an increased emphasis on more technically challenging and perhaps more commercially risky developments including High Pressure High Temperature (HPHT) and heavy oil.

Infrastructure

Most new fields will be too small to support their own pipelines and production facilities and will therefore rely on accessing existing infrastructure. However, much of the infrastructure is ageing. It is important therefore, that the exploration and appraisal of brownfield discoveries and marginal reserves is carried out before decommissioning plans are put in place for the infrastructure that these prospects may eventually require. With much of the pipeline network underutilised, time is an important factor in bringing such fields to production.

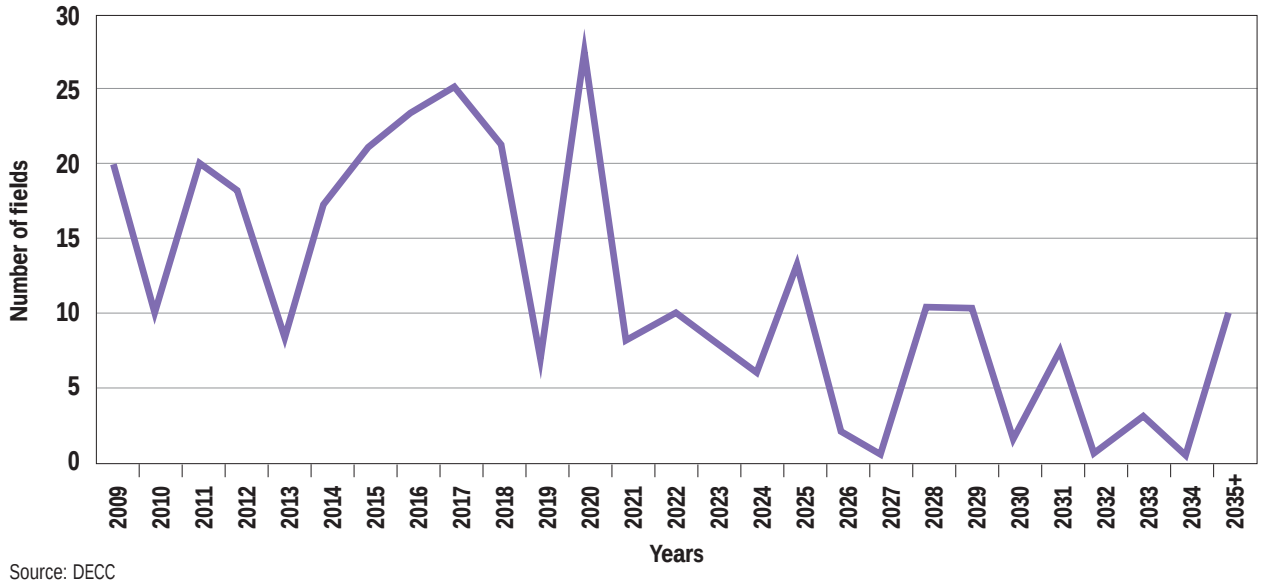
With more companies operating in the UKCS, access to infrastructure has become an important issue. Oil & Gas UK introduced a voluntary code of practice on access to infrastructure in 2004. The Infrastructure Code of Practice (ICOP) is a non-statutory industry code which sets out principles and procedures on negotiating third party access to oil and gas infrastructure. The Code also calls for greater transparency in pipeline tariffs and operation and suggests that all technical data, as well as commercial terms and conditions for all deals should be published.

Decommissioning

Decommissioning will be one of the biggest challenges facing the oil and gas industry over the next 20 years. It is a complex and costly process with a wide range of functions needed to dismantle the existing infrastructure. There are approximately 470 installations in the UKCS that will be decommissioned, including some large platforms and concrete sub structures, steel platforms and subsea and floating installations. There is also approximately 10,000 km of pipeline, 15 onshore terminals and approximately 5,000 wells that will be phased out.

In the past, Government statistics predicted installation removal dates. These results have been published in previous versions of this document, but due to frequently changing field closure data, this is now seen as unreliable. Instead, Figure 8 shows the number of fields projected to cease production in a given year, with figures based on operators' Cessation of Production (COP) predictions.

Figure 8 - Cessation of Production (COP) predictions 2009 onwards



Source: DECC

Estimating future decommissioning timetables is not an exact science. Issues including the possibility of increased recovery, oil and gas prices, future technical innovation, the market place and long term certainty of the fiscal and regulatory regimes may all affect decommissioning timetables.

Current decommissioning expenditure is on a much smaller scale than predicted as oil prices and technological advancements have extended the life of many fields. Oil & Gas UK suggest that total decommissioning costs of existing UKCS assets is projected to reach £19 billion by 2030 and possibly £23 billion by 2040, with total spending on decommissioning forecast to reach £25 billion.

CHAPTER 5 - Government

Taxation

In April 2009, the Chancellor of the Exchequer announced new incentives to stimulate investment in small and challenging UKCS projects. These include a field allowance to offset against the supplementary charge available for small fields as well as High Pressure High Temperature and heavy oil fields. It is hoped that this will unlock a further 2 billion barrels of oil. A fixed amount will be available to reduce tax payable for qualifying fields given development consent on or after 22 April 2009.

In a bid to maximise the use of existing North Sea assets and infrastructure and to encourage investment in renewable energy, fiscal barriers will be removed where assets and / or infrastructure are reused. This could be of potential benefit to offshore wind farms; gas storage and carbon capture projects. It will involve exempting income from change of use activities from petroleum revenue tax and allowing tax relief against corporation tax and petroleum revenue tax for decommissioning costs for change of use assets.

From April 2009, chargeable gains on North Sea asset disposals are exempt when proceeds are reinvested into the UKCS or where licenses of the same value are swapped. This should aid the transfer of oil licenses and serves to ensure these assets are developed successfully.

Generally, these incentives have been welcomed by the industry but there are calls for further support and incentives, particularly to (a) sustain and promote investment in older fields, (b) stimulate exploration activity, and (c) open up frontier areas in the West of Shetland. In June 2009, the Energy and Climate Change Select Committee argued that although welcome, the budgetary incentives introduced in the 2009 did not go far enough in helping to create the competitive environment needed by the industry or to provide a strong enough incentive to fully exploit the remaining UK's oil and gas resources.

Licensing

The 25th Offshore Oil and Gas Licensing Round was announced in February 2008. In addition to the 2,297 blocks or part blocks on offer, a further 72 blocks classified as fallow in 2007 were fully or partly relinquished in time to be on offer in this round. In November 2008, 171 licenses were offered to 100 companies (of which, 8 were newcomers to the UKCS) covering 257 blocks. Of the licenses awarded 124 were traditional, 41 were promote and 6 were frontier licences.

The Fallow Initiative was launched in 2002 to regenerate activity in acreage and assets that have remained dormant for a number of years. The initiative is continuing to play a key role in focusing unworked blocks back into use. In January 2009, the Department for Energy and Climate Change (DECC) released a further 36 fallow blocks or discoveries that must be relinquished if substantial activity isn't seen by the end of the year. Historically, blocks relinquished due to fallow pressure have been quickly re-licensed. Of the 58 partially relinquished and 24 completely relinquished fallow blocks offered in the 24th Round, 52 were re-licensed.

The Promote License was introduced in an attempt to increase exploration and appraisal activity, and attract new companies to the UKCS. It offers the licensee the opportunity to assess the prospectivity of licensed acreage for an initial two-year period without the stringent checks that have to be passed for a traditional licence. A total of 293 promote licenses have been awarded so far.

The Frontier License, introduced in the 22nd Licensing Round, was intended to encourage and support exploration and development in challenging areas like West of Shetland. The frontier license is aimed at larger companies who are most likely to prospect in the challenging areas of the Atlantic margin. They offer 10% off the cost of a traditional license for the first 2 years, and offer a large amount of acreage on which to explore. The licensee can then relinquish three quarters of the acreage after the initial 2 year period to focus on the area which shows the best potential. Six Frontier licences have been awarded in each of the last three licensing rounds.

CHAPTER 6 - Workforce

Employment

In 2008, the total employment provided by the oil and gas sector in the UK was estimated to be approximately 450,000. Based on a study commissioned by Oil & Gas UK, the total can be broken down as follows

- 34,000 directly employed in the oil and gas companies and major contractors;
- 230,000 employed in the wider oil and gas supply chain;
- 100,000 in jobs exporting goods and services ; and
- 89,000 in jobs supported by the economic activity induced by oil and gas employees spending throughout the wider economy

Employment in the oil and gas industry is spread across the UK, but with a high concentration (44%) in Scotland, particularly in the Aberdeen City and Shire area.

According to the latest Aberdeen and Grampian Chamber of Commerce Oil and Gas Survey (February 2009), employment trends continued to rise in 2008 with 29% of operators reporting rising and 57% level employment trends. The predictions for 2009 were less positive with only 16% of operators expecting an increase and the majority expecting to reduce total employment. The growing trend in permanent employees was expected to level off in 2009, while the numbers of temporary and contract staff were expected to fall.

Training and Skills Shortages

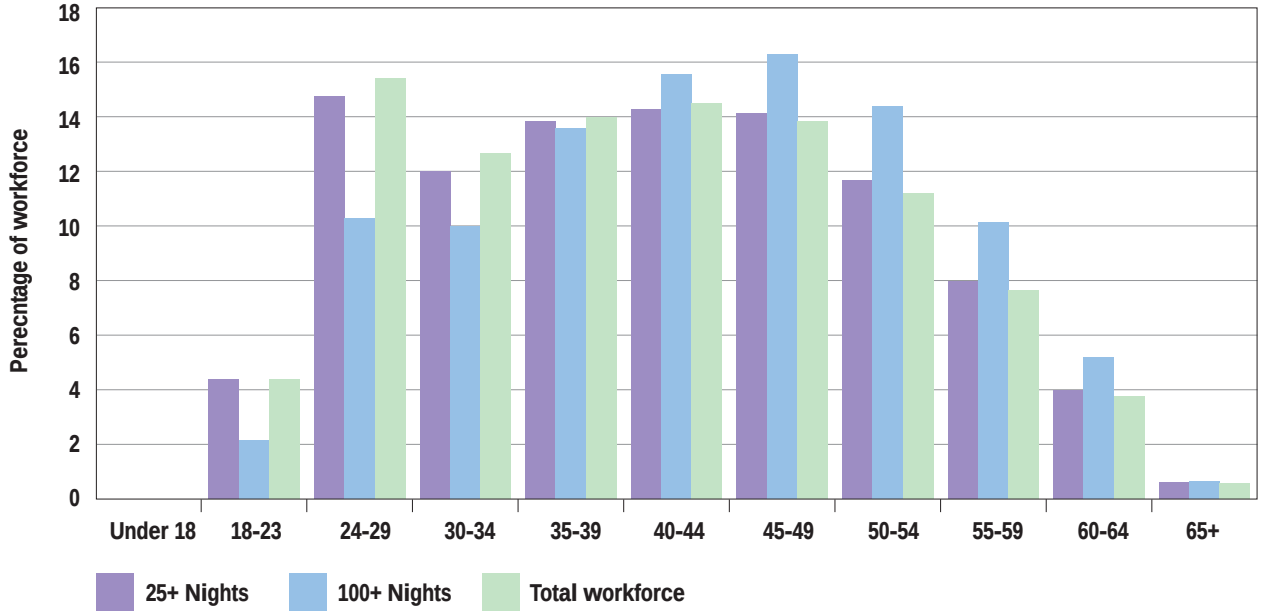
The issues of an ageing workforce and a worldwide industry skills shortage have lead the industry to look at new and creative ways of recruiting staff. As well as working to improve the reputation and attractiveness of the UKCS as a place to work for skilled overseas workers, the industry are also committed to a number of training programmes and centres of excellence to improve the indigenous skills base.

In December 2007 the Oil and Gas Academy was set up by the industry to support the development of the next generation workforce. The aim is to provide the training which helps to produce safe, skilled and more effective industry employees. There are currently 323 people on the modern apprenticeship schemes. The Oil and Gas Academy works to create stronger links between education and industry in an attempt to ensure that students are adequately equipped to deal with the future needs of the UKCS industry.

Workforce Demographics

In 2007, Oil and Gas UK updated a report on the demographics of the UKCS workforce. The research showed that the average age for the total UKCS workforce remained 41 years. Figure 9 shows the age distribution of the total workforce. It also shows the percentage of employees in that total who work 25+ and 100+ days offshore per year. The results indicate that there is still under representation in the under 24 and 30-34 year old age groups.

Figure 9 – 2007 Age Profile for entire UKCS



Source: Oil and Gas UK – 2007 UKCS Workforce Demographics Report

The average age of the workforce differs across occupations; drilling and well service personnel have a younger average compared with production and maintenance personnel.

The number of women working offshore continued to gradually increase. In 2007, there was a 7.2% increase on the previous year's figure. Although many are still employed in the catering sector, there has also been a positive rise (8.4%) in the number of women employed in technical/ non catering roles. Female employees also have a lower average age profile of 34.4 years old.

The survey also recorded 121 nationalities working within the UKCS workforce in 2007, with UK workers accounting for 86.5% of total personnel.

CHAPTER 7 - Outlook

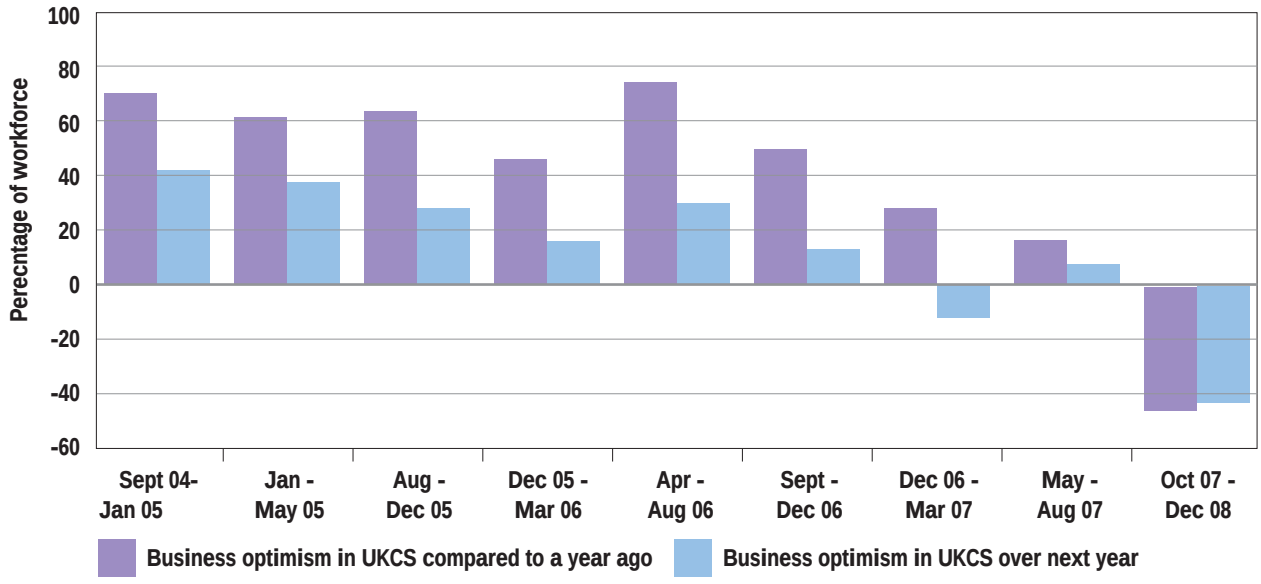
Business Optimism

In February 2009, The Aberdeen and Grampian Chamber of Commerce published the 10th Oil and Gas Survey. The survey examines business optimism, trends in employment, business and investment, competitiveness and constraints. Past surveys have shown high business optimism in 2005 and 2006, with a less marked growth of confidence in 2007. The key findings from the 10th survey are:

- the UKCS is emerging from a period of rising investments, activity and employment into an increasingly uncertain future in the current global economic recession.
- declining levels of business confidence have been visible since 2008, but it is predicted that it will become more significant in 2010.
- the majority of contractors working in the UKCS reported working at above optimism levels in 2008, but they expect this to weaken in 2009.
- the majority of operators expect to reduce total employment levels in 2009. The net balance of contractors expects to increase total, permanent employment but both operators and contractors expect a reduction in use of contract and temporary staff.
- operators and contractors think the UKCS is more competitive in terms of techniques and equipment but have concerns that competitiveness could be eroded by cost pressures, lower profit margins and cost inflation.
- both operators and contractors list commodity price, rising costs, tax relief/capital allowances, the current economic climate and life costs as the five most important business constraints.

In contrast to the results in 2007, all operators surveyed reported feeling less confident regarding their business situation in the UKCS over the next year. The decline in business confidence is less widespread amongst contractors but still the majority view. Figure 10 tracks the net balance of contractor business confidence from September 2004 - December 2008.

Figure 10
Table 1 - Contractors - business confidence in UKCS (net balances)



Source: AGCC Oil and Gas Survey (Feb 2009)

Weakened business confidence is also reported by oil and gas operators and contractors outside the UKCS. Amongst contractors, business optimism has dropped by a net of 22% compared with the previous year.

Expenditure Forecasts

According to the Oil & Gas UK's 2009 Economic Report, total expenditure on the UKCS for 2008 was £13 billion, a slight increase on the previous year. The main contributor to higher expenditure is cost inflation rather than higher activity levels. Oil & Gas UK predict total expenditure to fall in 2009 as companies try to restrain costs in the current economic climate.

The 2007 Spends and Trends report produced by Scottish Enterprise forecasts offshore expenditure in the UKCS until 2011. It reports that expenditure in the UKCS is expected to decline by 40% between 2007 – 2011. Although by the end of the period, expenditure is forecast to be only slightly lower than the annual average for the 2002 – 2004 period. The biggest fall is expected in capital expenditure (Capex), where a fall of 70% is forecast in the period 2006 – 2011.

Figure 11 – UKCS Expenditure Summary, (£million)

	2006	2007	2008	2009	2010	2011	CHANGE 06-11
Exploration	600	690	550	470	370	280	-53%
Capex	5720	4710	4230	3420	2760	1800	-69%
Opex	5790	6000	5680	5420	5110	4790	-17%
Decomm	500	620	390	410	480	580	+16%
Total	12610	12020	10850	9720	8720	7450	-41%

Source: Scottish Enterprise (figures converted from $ to £)

CHAPTER 8 - Renewable Energy

The European and National Context

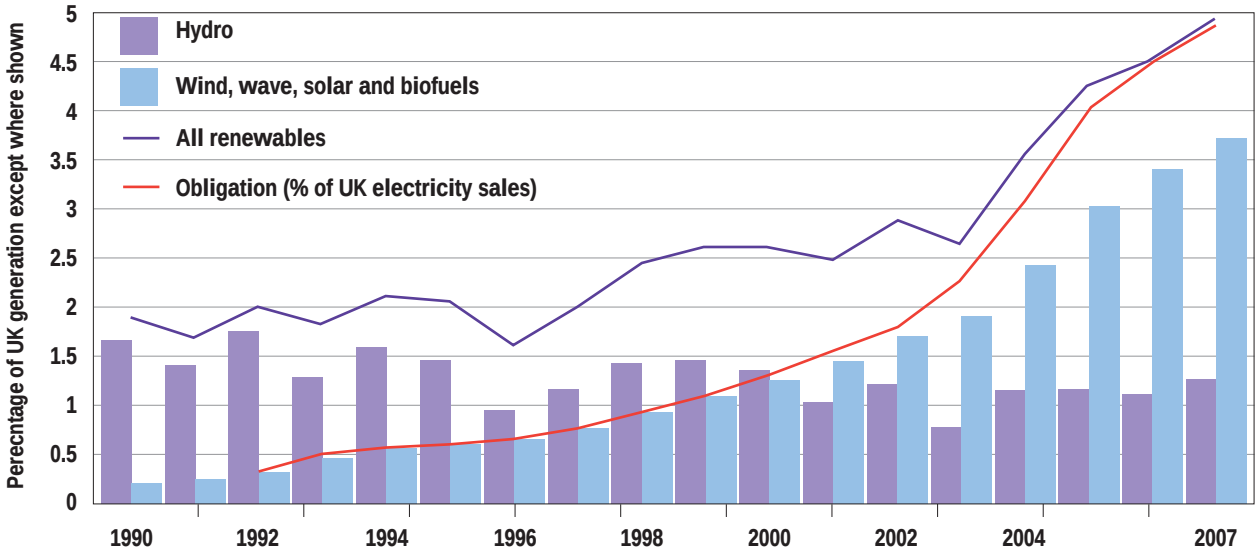
Both the UK and Scottish Governments remain strongly committed to more extensive use of renewable energy. In Spring 2007, the UK agreed with other Member states to an EU wide target of 20% renewable energy by 2020 – including a binding 10% target for the transport sector. Member states have now signed up to the Renewable Energy Directive which includes a UK share of 15% of energy from renewables by 2020.

In July 2009, the Scottish Government published the Renewables Action Plan, which identifies the collective actions of government, its agencies and partners to ensure that at least a fifth of Scotland's energy comes from renewables by 2020. The Scottish Government has also set a target of 31% of electricity coming from renewables by 2011 and 50% by 2020.

In 2007, across the UK as a whole, biomass accounted for 82% of renewable energy sources, with most of the remainder coming from large-scale hydro and wind generation. Of the 5.17 million tonnes of oil equivalent of primary energy use accounted for by renewables, 4.08 million tonnes was used to generate electricity, 0.73 million tonnes to generate heat, and 0.36 million tones was used for road transport. Renewable energy use grew by 8.4% in 2007, and is now over five times the level it was at in 1990.

Figure 12 shows the UK growth in electricity generation from renewable sources in the UK since 1990 and illustrates the effectiveness of the Renewables Obligation legislation in 2002.

Figure 12 - Growth in electricity generation from renewable sources since 1990



Source: UK Energy in Brief 2008 http://www.berr.gov.uk/energy/sources/renewables/index.html

Renewables accounted for 5% of electricity generated in the UK in 2007, up from 4.5% in 2006.

Renewable Energy – Aberdeen City and Shire

In many respects, the Aberdeen City and Shire area is well placed to play a leading role in developing renewable energy technologies. The development of a successful oil and gas industry over the past 40 years can be seen as a useful template for renewables with technology, skills and business practices transferred to the emerging renewables sector. In 2001, Aberdeen Renewable Energy Group (AREG) was created by Aberdeen City Council to help develop the region as a centre of excellence in renewable technologies and facilitate a transfer of employment from oil and gas to renewables.

AREG are currently working on several flagship projects including the Energy Futures Centre in Aberdeen. The centre will lead the way nationally and globally in research and development of renewable technology by bringing together the key players from across the energy sector.

AREG are also working in partnership with the city's universities to develop a new Renewables Research Centre. In September 2008, Professor Hicham Idriss was appointed as Chair of Energy Futures, jointly held by the University of Aberdeen and the Robert Gordon University. The universities signed a collaborative agreement and contributed £700,000 for an initial three-year period. The new initiative aims to contribute to the development of a Scotland-wide co-operative research programme through the Energy Technology Partnership.

Aberdeen hosts the annual All Energy conference and exhibition, the UK's largest event devoted to renewable energy .The 2009 event saw a 17% increase in attendance from the previous year with visitors from 60 countries and 380+ exhibitors. This year, the All Energy concept is set to go global with an Australia event taking place in October.

In February 2008, the Scottish Government announced that Aberdeen would be the home of the Scottish European Green Energy Centre. The centre is envisaged as a pan-European hub to promote international networks and partnerships with those involved in the research and development of renewable energy.

Aberdeenshire Council has made a further commitment to becoming a carbon neutral organisation by 2020. Being 'carbon neutral' means removing as much carbon dioxide from the atmosphere as is put in. It includes supporting projects such as wind farms and solar parks, making clean energy more affordable, and reducing future greenhouse gas emissions to make up for travel and electricity uses. In July 2009, Aberdeen City Council launched an updated Carbon Management Programme. The programme is part of a scheme run by The Carbon Trust to help local authorities achieve carbon savings.

Wind Energy

Much of the current renewable energy activity is focused on wind power as the technology is well developed and commercially viable. Scotland's climate means there is considerable scope to generate power through onshore and offshore wind. Scotland has a quarter of Europe's wind energy potential with a potential energy output of 36.5GW. As Scotland only has a requirement for 10.5GW, there is the potential of the country becoming a net exporter of wind-produced electricity.

AREG and Swedish utility company Vattenfall are investigating the feasibility of developing a windfarm off the coast of Aberdeen City and Shire. The original windfarm proposals were for 23 turbines stretching from the Bridge of Don to Blackdog, but it is likely that the number of turbines will be reduced before the proposals go for planning consent at the end of the year. The complete windfarm project could produce enough energy to meet most of the domestic energy supply of Aberdeen City.

As well as producing green energy, the site may also act as a European test centre for offshore wind technology. In January 2009, the European Commission announced that it intended to invest 40 million Euro in the proposed test centre if plans go ahead. The creation of a test centre off the North East coast would place the area at the forefront of wind technology. It would also significantly strengthen the area's position in the UK, Europe and perhaps globally, as a centre of wind technology.

Talisman Energy (UK) and Scottish and Southern Energy (SSE) have developed the world's first deepwater windfarm in the Moray Firth. Two turbines will be used until 2011 to evaluate the planned 200 turbines wind farm that Talisman and SSE have been considering developing to prove the technical and commercial viability of deepwater offshore windfarms. The project is innovative in many ways: the first offshore wind turbine in 45m of water; the first offshore deployment of a 5MW machine; the first use of an oil and gas type jacket to support the turbine; and the first onshore assembly of the turbine tower, nacelle and blades (with transportation and installation of the complete unit).

In Aberdeenshire, Centrica's Glens of Foundland windfarm has brought 26 MW of generating capacity into production. The windfarm has a life expectancy of 25 years and produces enough energy to meet the annual needs of more than 13,000 homes. Adjacent to the Glens of Foundland development is the Dummuies windfarm with 10MW of production capacity.

Boyndie windfarm is situated near Portsoy and creates approximately 14 MW of electricity from seven turbines. Boyndie Co-op bought a share in the farm and became the first wind farm co-operative in Scotland. The aim of the co-operative is to give local people an opportunity to invest in the production of renewable energy. In 2006, the project won the category of 'Best Community Initiative' at the Scottish Green Energy Award.

Mackie's ice cream factory near Inverurie uses three turbines to produce 2.5 MW of electricity. Surplus energy is sold to Good Energy, a supplier of renewable electricity sourced from 300 wind, small-scale hydro and solar power producers.

In May 2007, Cults Primary School in Aberdeen became the first school in Scotland to use wind generated power. The installed turbine is powerful enough to run most of the school's canteen, while an LCD screen has been installed to let children and staff monitor wind speed and direction, power output and the amount of carbon dioxide that would have been pumped into the environment if the school had used mainstream power sources.

Biomass

Biomass is natural materials like wood, plants and animal waste which are used to create fuel, heat and energy. Aberdeen City and Shire is ideally placed for biomass energy production due to plentiful resources from forestry. Some examples of current and future North East bio mass projects include;

Crichiebank Business Centre in Inverurie opened in 2005 and is heated entirely by using locally produced biomass chip.

Aboyne Academy is one of the first schools in Scotland to have installed a biomass heating system. The 600 KW boiler heats the school and the swimming pool and reduces the school's green house emissions by 600 tonnes a year.

Macphie of Glenbervie are set to become the first manufacturer to make food ingredients using green energy from woodchips. The 1.2 MW biomass boiler is expected to help the company reduce its Co2 emissions by 2,100 tonnes every year.

NHS Grampian plan to build a new energy centre at the Foresterhill hospital site. The new centre will be the first NHS acute hospital to use wood fuel. It is hoped that the new energy centre will provide most of the site's electricity with a biomass boiler providing top-up heat. Construction of the energy centre is due to commence in Autumn 2009.

Banff Academy and its adjacent swimming pool will be heated by a wood pellet boiler when it is commissioned in the third quarter of 2009.

Aberdeenshire sustainable community halls initiative has been developed by Aberdeenshire Council. It aims to convert village halls across the area to renewable technologies. Over 70 halls are in the programme and the next phase is to carry out energy audits and identify the renewable heat and power opportunities available to them.

Other renewable energy sources

Scotland has a quarter of Europe's wave and tidal resources. Although many of the large projects are based in the waters around the Highlands and Islands, Aberdeen City and Shire contributes significantly with research and development, product design, development and manufacture and a skilled workforce. Companies making an impact in the marine renewables sector based in the City and Shire include Rotech Engineering, SeaEnergy, Neptune Ross Deeptech, Green Ocean Energy, Subocean and Reflex Marine.

Although there has been a slow uptake of solar panels in the UK compared to many other countries at similar latitude, in 2005, Aberdeen City Council installed the largest solar array in Scotland at the Bridge of Don Academy to heat the water in the swimming pool.

CHAPTER 9 - Conclusions

- The UK is the fourteenth largest combined oil and gas producer in the world the second largest in Europe.
- Approximately 38 billion barrels of oil equivalent (boe) have been produced from UK offshore areas in the last forty years.
- It is estimated that there is potential for a further 15 - 25 billion boe to be extracted
- In 2008, the UKCS produced 549 million boe, which was almost enough to cover all UK domestic consumption.
- The 25th Licensing Round awarded 171 licenses to 100 companies (including eight newcomers to the UKCS) covering 257 blocks.
- Around 40,000 people work directly in the energy sector, offshore and onshore in Aberdeen City and Shire
- Aberdeen City and Shire is fast becoming a centre of research and development excellence in renewable technologies.

Challenges and Issues

- The UKCS is now a mature province with the size of finds declining.
- Costs of exploration, development and operation are amongst the highest in the world.
- The current economic climate and uncertainty over oil prices has led to limited investment in new oil fields. Exploration is down substantially this year which may impact on production in the coming years.
- The industry feel that recent budgetary incentives do not go far enough in helping to create the competitive environment or incentives needed to fully exploit the remaining gas and oil reserves.
- The future may see more volatile swings in oil price across shorter cycles.
- New fields are too small to support their own pipelines and production facilities; they will need to rely on existing but ageing infrastructure.
- Ensuring that in the medium to long term, the workforce can adapt to transferring their skills from traditional production and exploration to decommissioning and renewables.
- Delivering Energetica, the proposed technology corridor between Aberdeen and Peterhead. The Energetica project is being led by Scottish Enterprise for ACSEF and will comprise a series of interconnected energy and non-energy-related developments.

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