



Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

Skills Investment Plan

For Scotland's energy sector

2nd edition



Foreword



Frank Mitchell
Chair of the Energy Skills Action Group and
CEO of Scottish Power Energy Networks

Scotland is one of the world's energy hubs, and the sector is a vitally important part of the Scottish economy, historically accounting for a quarter of all output. History demonstrates that energy investment levels can often be cyclical, however to keep pace with our potential, we must continue developing our talent and skills ensuring Scotland has the capacity to deliver the qualified workforce the industry needs for our domestic market and growing international opportunities.

It has been 3 years since the original Energy Skills Investment Plan (SIP) was launched, and there has been considerable progress in developing improved supply and in the numbers being trained. Moreover, the public sector partners in particular have found the SIP document useful in providing a much greater understanding of industry demand, providing impetus enabling appropriate action to be taken with greater confidence. This confidence came through both the quantification of the opportunities and the detailing of different types of need and employer demand. The SIP therefore has helped to ensure that all the issues are covered, and as such provides a strategic framework within which emerging priorities can also be put in context and considered. There are many commentators and reports that emerge from time to time on employment opportunities and challenges by sector and geography. The key strength of the SIP has been that it has given policy makers a reference point of industry-led demand, enabling appropriate action to be taken with some confidence that they are doing the right thing.

As a result, we continue to provide world-leading research and postgraduate provision; the sector in Scotland is attracting an increasing number of new graduates from a broad range of disciplines; a wide spectrum of energy-related courses have been developed by Scotland's Universities and Colleges in response to industry demand; and over 500 energy related Modern Apprenticeships have been delivered annually.

However, as we have sought to update and refresh the SIP workplan, the industry has been facing up to significant structural change, primarily as a result of the falling oil price. The establishment of an Energy Jobs Taskforce reflects the scale of the challenge being faced by oil and gas in particular in retaining staff, and we will fully engage with the Taskforce and with industry as these structural changes develop.

Indeed, actions are already underway that seek to mitigate the effects of the falling oil price on the energy sector's skills picture. The guarantee of alternative employment or training for Modern Apprentices in the oil and gas sector faced with redundancy will help provide more stability, as will the additional support available to sector employers to participate in the Adopt an Apprentice programme.

At the same time, SDS management of the Partnership Action for Continuing Employment (PACE) framework will ensure a tailored, local-level response to help and support those individuals who are at risk of redundancy.

Coupled with other uncertainties such as global energy supply and demand, government investment stimulus policy, access to affordable finance and the speed of deployment of emerging developments, it's clear that these issues can and have been used as a reason to explain a lack of robust workforce planning, with industry finding it difficult to predict likely future employment and skills requirements.

However, what is clear is that many sectors face an ageing workforce and even without growth, the energy sector faces significant challenges in attracting and recruiting the workforce of the future. The additional pressure to cope with the emerging

requirements of decommissioning redundant power plants and ageing North Sea infrastructure should also not be underestimated.

With the skills supply side having ensured it has the capability to meet demand, the onus is on industry leaders to play their role in defining their human capital in the same way as any business undertakes its financial planning. Short termism in this area has led many businesses to raid their supply chain for skills rather than put in place a sustainable workforce plan that attracts all genders and ensures that when market conditions permit, there is the capacity to react fast to new opportunities.

There is a clear danger of energy sector employers repeating the mistakes of the past in this respect. Reacting to current pressures by retreating from sustainable, long-term workforce planning will leave firms unable to grasp those opportunities when they arise, particularly in the international energy market.

I am confident Scotland has the talent to grasp those opportunities, ensuring that the energy sector can grow and be successful going forward, providing high quality jobs which will contribute towards the Scottish economy remaining strong in future years. This will require ongoing leadership not only from Government and Academic Institutions, but increasingly from industry, with the CEOs of large and medium companies taking personal ownership of this progressive agenda.

Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

Introduction

Skills Development Scotland (SDS) published the first Energy Skills Investment Plan (SIP) in March 2011.

The purpose of the SIP was to:

- validate and bring clarity to the scale and nature of the skills issues which face the sector
- create direction and bring focus to the nature of the response required by the public sector and industry, on the priority skills issues, and
- provide a framework for public sector and private sector investment to develop skills provision to meet industry needs.

Much has been achieved through collaboration across the skills and training sector since the launch of the SIP, with a range of initiatives introduced to tackle key issues. However, the falling oil price in particular has created considerable uncertainty for the sector, with firms across the industry and supply chain looking to restructure their operations and look at ways to reduce spending without affecting objectives. Whilst it is difficult to predict future employment and skills requirements with any degree of certainty there remains an ongoing significant demand for new and replacement labour across the sector. As such, it is vital to continue to build on what has been achieved so far, and target future action to sustain the industry and make sure we have the workforce needed for the future. This will require employers to continue investing in skills and workforce development throughout the downturn, so that when economic conditions become more favourable, they are in a position to capitalise on emerging opportunities.

This document:

- updates on the progress made since publication of the SIP in 2011
- presents an overview of the sector and its sub-sectors
- reflects on the challenges facing the sector at present and the skills priorities
- sets out a series of actions to be taken forward by partners.

The refresh is an important step in assessing the extent of collaborative action between industry and public sector partners, to ensure that economic and employment opportunities across the energy sector can be realised.

A number of other SIPs have been produced or are in development since the publication of the Energy SIP. These cover a range of sectors with similar skills requirements to energy, such as engineering, advanced manufacturing, chemicals and construction. Skills supply and demand for the energy sector cannot be viewed in isolation and needs to be considered in the context of demand arising from these other sectors.

SDS commissioned this refresh of progress against the Energy Skills Investment Plan priorities, on behalf of the Scottish Government, and has sought the views of industry and stakeholders on the adequacy of current and proposed measures to meet future skills requirements. The development of the refreshed SIP involved gathering and analysing a range of primary and secondary data. These findings were tested and validated with industry, education and training sectors and other public bodies. These included employers and employer led bodies such as:

- Energy Skills Action Group (ESAG)
- Industry Leadership Groups (ILGs) for Oil & Gas, Renewables, and Thermal Generation/CCS
- Energy Technology Partnership (ETP)
- Energy Skills Partnership (ESP)
- Oil & Gas Academy of Scotland (OGAS)
- National Skills Academy for Power (NSAP)
- National Skills Academy for Nuclear (NSAN)

The SIP benefitted with advice from our close working partners including the Enterprise Agencies, the Scottish Funding Council (SFC), OPITO, ECITB, and Energy & Utility Skills.

Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

1 Energy SIP (2011) and achievements

Following the production of the SIP there has been considerable progress in developing improved supply and in the numbers of people undertaking training.

The Energy SIP was produced in March 2011 and it identified a set of skills priorities:

- making the sector attractive to young people, and promoting opportunities to those considering career changes
- increasing the number of apprenticeships available to enable new, technician level entrants
- ensuring adequate higher education provision to meet the growing demand for STEM graduates
- flexible training frameworks to provide short transition courses to enable those moving in to the energy sector to apply their existing skills in a new context
- ensuring adequate facilities to provide specialist training.

Considerable progress has been made by the skills system in responding to the challenges of the SIP. The document has provided the impetus for action to be taken with more confidence, supported by a greater understanding of industry demand by public sector stakeholders. The high level Action Plan detailed within the Energy Skills Investment Plan (SIP) proposed a number of measures across public sector partners to respond to the sector's requirements. These were structured around five strands of activity:

- raising awareness of the sector - a unifying campaign with the education sector and industry partners
- developing skills for the sector – increased investment in vocational training
- influencing the skills system and mainstream resource allocation
- building capacity and flexibility to meet industry and regional labour market requirements
- effective use of sector intelligence to inform decision making.

A substantial range of interventions have been implemented across the five strands of activity. Some of the more significant developments are highlighted in Figure 1.1.

Figure 1.1: Achievements since the launch of the Energy SIP

Raising awareness	Developing skills	Influencing skills system	Building capacity	Sector intelligence
Specific careers websites developed including My World of Work energy section, thinkpowersector.co.uk and myoilandgascareer.com	46% increase in Engineering & Energy MA starts	Energy Skills Scotland (ESS) launched with £6.5m, to act as focal point for industry	Energy Technology Partnership (ETP) - collaboration across Scottish universities; and Energy Skills Partnership (ESP) offering training across college regional hubs	ESS website- energyskillsscotland.co.uk
3,500 STEM Ambassadors working with schools in Scotland	ESP supported over 1500 students in industry specific work readiness programmes	68% increase in graduates entering employment in energy sector	OGAS established and supported through ESS to develop capacity and additional technical training facilities	Establishment of Energy Skills Action Group to articulate needs of industry
12,000 individuals participating in 700 SCDI Young Engineers clubs	Transition training programmes have supported c 500 to enter employment, and over 2000 undertake training	5% increase in HE Engineering & Technology undergraduates	Wind/Marine/ Grid Networks established, supporting over 400 individuals undertake industry specific training	Launch of the Oil and Gas Skills Navigator – a centralised online portal for oil and gas skills information
Over 150 schools participating in the Junior Saltire Prize (Marine Renewables) challenge	Low Carbon Skills Fund supported c2,700 in SMEs to undertake low carbon/energy efficiency training	Energy Industry Doctorate programme supporting c70 students	£200k CPD programme through ETP/ESP supported 426 individuals	Development of Workforce Planning Model by Energy & Utility Skills for renewables sector

Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

2

Overview of the sector (2014)

The Government Economic Strategy (GES) for Scotland identifies energy as one of seven growth sectors offering significant potential to drive sustainable economic growth.

This section gives an overview of the sector as a whole, before going on to describe the sub sectors in more detail, including the challenges each faces in relation to skills. This sets the scene for Section 3, where we go on to identify the common themes across the sub-sectors.

Economic output

The energy sector is a large and important part of the Scottish economy accounting for over a quarter of all output. Oil and gas extraction accounts for over 70% of the Gross Value Added (GVA) produced by the sector.

Economic output from the energy sector (as measured by GVA) amounted to £28.7bn¹ in 2011, accounting for over a quarter (28%) of total Scottish GVA in that year.

The majority (71%) of GVA from the energy sector is generated from oil and gas extraction activities.

Productivity

Energy is the most productive sector of the Scottish economy in terms of the level of GVA generated per employee.

GVA per employee in energy is around seven times the average for all industry sectors. Looking in more detail at sub-sectors of the industry, the wealth generation associated with oil and gas activities is clear. The 'extraction of crude petroleum and natural gas' sub-sector generated £2.5m GVA per employee in 2011 – over 40 times the average of £59k for all industry sectors.

Business base

The vast majority of people working in energy in Scotland are employed by large firms, though the sector also has high levels of self-employment and lots of sole traders.

In 2013, there were 60 registered companies operating in the energy sector in Scotland that had 250 or more employees. Combined, these companies employed 81% of all people working in the industry. This was much higher than the equivalent figure of 50% for all industry sectors, demonstrating the reliance of the energy sector on a relatively small number of large firms.

Energy sector workforce

Employment in the energy sector has held up well in recent years despite the prevailing economic climate.

There were 63,400 people directly employed in the energy sector in Scotland in 2012, accounting for 3% of all Scottish jobs, according to Scottish Government growth sector statistics. Employment in the sector increased by 3% between 2009 and 2012, during which time total employment across the economy fell by 4%. Scotland accounts for 9% of GB employment across all industry sectors, but 22% of all GB jobs in energy.

Over half (57%) of all Scottish energy jobs are located in Aberdeen City and Aberdeenshire, again reflecting the dominance of oil and gas.

In addition to estimates of direct employment within the energy sector in Scotland, which are produced by the Office for National Statistics and published annually by the Scottish Government, there are a number of other sources of employment estimates for the various sub-sectors of the energy industry. These are produced by industry bodies with the aim of providing more a comprehensive assessment of levels of both direct and indirect employment in the industry.



Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

¹ Figures shown in current basic prices

2

Overview of the sector (2014) continued

OIL & GAS

- **One in 80 jobs** in the UK is provided by the oil and gas industry
- **375,000 jobs** supported in the UK
- Industry boosts UK trade balance by **£30bn per year**
- Oil & gas provides **more than 70%** of the UK's primary energy. (Oil & Gas UK Economic Report 2014)

EY(2014) Fuelling the next generation

Sector outlook

Whilst demand for oil and gas within OECD countries is falling, it continues to rise in non-OECD countries. The UK Continental Shelf (UKCS) still has substantial oil and gas resources and exploration potential. However, the longevity of the industry in Scotland will largely be dependent on its ability to secure continued investment, and the recent fall in oil prices could have an impact on investment. Investors are currently facing a series of risks and challenges including the unknown success of new field developments, rising operating costs, reduced production efficiency and issues around access to finance, particularly for small and medium operators.

Investment is not the only factor that will impact on the longevity of the UKCS. Whilst sanctioned investments guarantee the industry will be active for another 15-20 years, the future to 2050 and beyond will be reliant on a number of factors such as success in developing innovative technologies for maximising recovery and reducing costs, commodity prices, cost inflation, rate of technical improvement, access to infrastructure, fiscal policy and supply chain capacity and capability².

In the short term, investment will continue to focus on exploration activities. However, the North Sea's offshore oil and gas industry will be entering a new phase in its operations during which it will be necessary to decommission some of its installations, many of which have been in operation for over 30 years³. The next couple of decades will see a growing number of redundant oil and gas installations in the North Sea being decommissioned.

Skills and employment issues

Scotland is a leader and a global centre of excellence in offshore engineering, subsea technology and in the export of offshore goods and services. Despite a forecast reduction in overall workforce numbers, and recognition that numbers are constantly changing given the volatile price of oil, ongoing requirements for relevant skilled and experienced staff will continue, with EY identifying opportunities for as many as 12,000 new entrants as the industry continues to develop a sustainable talent pool, with 6,000 graduates and 13,000 apprentices employed currently⁴.



"The longevity of the industry in Scotland will largely be dependent on its ability to secure continued investment"

Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

² Oil and Gas UK (2013), Economic report

³ Decom North Sea (2009), Report on Industry Consultation: North Sea Decommissioning Supply Chain Steering Group

⁴ EY (2014), Fuelling the next generation

2

Overview of the sector (2014) continued

Despite widespread perceptions of an ageing workforce in the oil and gas sector, previous research by both Oil and Gas UK and OPITO has found that for some areas of the workforce (particularly offshore, craftspeople and technicians), the mean age of workers is considerably lower than for others⁵, and this is backed-up in the “Fuelling the next generation” report which highlights that the proportion of over-55s is much lower at 10% than the national average.

Research suggests that many companies in the oil and gas sector have experienced difficulties trying to recruit design engineers, mechanical engineers, engineering and professional engineering occupations⁶. This is supported by a recent survey of oil and gas firms based in Aberdeen City and Aberdeenshire, which found that more than half of all contractors operating in the sector were having difficulty recruiting managerial, professional and technical staff⁷. Oil and Gas UK has also reported areas of skills shortages in a number of mid-career, onshore roles, including design engineering, subsea and drilling engineering, project management and geosciences⁸. EY⁹ reports that recruitment to senior-level positions within Technical Safety, Drilling, Geosciences and Business Support Services is still challenging for employers.

The evidence suggests that whilst recruitment challenges are still prevalent, the industry appears to have taken steps to address the problems it faced previously in relation to the scale of skills shortages.

An important recent development is that in early 2014 the Oil & Gas Innovation Centre (OGIC) was launched with £10.6 million from the Scottish Funding Council. OGIC will leverage an estimated £26 million over 5 years to maximise production and reduce costs through innovative technical solutions developed by Scottish universities working in collaboration with industry. It is important that there is sufficient R&D resource to address these challenges.

Emerging issues

In 2014, following a request from the Oil and Gas Industry Council which governs the UK government’s Oil and Gas Industrial Strategy, the Department for Business, Innovation and Skills, Oil & Gas UK and OPITO commissioned an in depth study of the labour market to provide further analysis of the current trends as well as identifying potential future skills gaps. The ensuing report “Fuelling the next generation” was produced by EY in December 2014, with a clear message that the industry must continue to invest in developing its own.

EY¹⁰ identifies a series of issues which continue to be relevant:

- the perceived skills gap at mid-career is not as significant as previously thought
- senior staff roles in disciplines such as Technical Safety, Drilling, Geosciences and Business Support are difficult to fill
- whilst the scale of skills shortages is less significant than 12-18 months ago, 70% of companies still experience recruitment difficulties, though this is often related to specific grades mentioned above
- whilst women make up around a quarter of the overall workforce, there continues to be disparities between technical and non-technical roles
- operations and maintenance disciplines are currently experiencing high recruitment activity and should continue to do so over the next 5 years
- increase in decommissioning activity, international expansion, greater need for enhanced oil recovery skills, digitalisation and onshore shale development are highlighted as drivers of future demand
- the high cost of contracted staff is still a challenge, though a number of companies are trying to reduce their reliance of contract personnel.

Recent drops in oil prices have resulted in job losses in the oil and gas sector. Within this context, an Energy Jobs Taskforce has been established to coordinate support measures to ensure a sustainable workforce is maintained across the energy sector, with an initial focus on oil and gas given the current challenges being faced by the sector. The aims of the Taskforce are to:

- Implement a co-ordinated response to ensure Scotland retains, and where possible grows, the level of employment, skills and talent which supports Scotland’s internationally competitive energy industry

- Ensure partners in government, agencies, trade unions, and industry are working together across the sector to maintain jobs and to mitigate the impact of any losses

- Facilitate the closer co-ordination of the mechanisms that exist in Scotland to support current and future needs of the energy sector

There is immediate action already underway, against each of the initial three themes, summarised in Figure 2.1.

Figure 2.1: Actions for Energy Jobs Taskforce

Action Programme	Activities	SIP Action Plan	Timescales
Respond	<ol style="list-style-type: none"> 1. National support helpline – PACE – 0800 917 8000 2. Free advice and career coaching service - Integrated response across all public partners 3. Incentive to support displaced apprenticeships facing redundancy – Adopt An Apprentice 4. Support for retraining & job matching 5. Industry & Trade Unions to promote PACE offer to employees, contractors and employers at risk 	Theme 1, 2	Live from February 2015
Fair Work & Job Retention	<ol style="list-style-type: none"> 1. Commitment by industry to promote progressive 'Fair Work' practices across the Oil & Gas sector and within the supply chain 2. A formal pledge to sustain investment in Modern Apprenticeships within the sector 3. A formal pledge to sustain investment in graduate development within the sector 4. A formal pledge to support up-skilling and re-skilling programmes across the Oil & Gas sector and within the supply chain 	Themes 2, 4	Formal commitment by industry & industry bodies by April 2015
Plan For Future Growth 'Oil & Gas UK predict a requirement for 12,000 additional entrants by 2019'	<ol style="list-style-type: none"> 1. Identify specific skills that are likely to be more at risk given structural changes & investment projections across the sector. 2. Implement a range of actions to support up-skilling and re-skilling so that employees can be retained or can transfer to other growth sectors 3. Identify specific skills that are likely to be more in demand in the future. Align investment in future skills with projected growth in decommissioning 4. Identify specific skills that are likely to be more in demand in the future. Align investment in future skills with projected growth in international markets 	Theme 6	Detailed action plans to be developed by June 2015

⁵ Oil and Gas UK (2012), UKCS Workforce Demographics Report; Opito (2011), LMI Report

⁶ Opito (2014), Upstream O&G Industry LMI Report

⁷ Aberdeen & Grampian Chamber of Commerce (2013), Oil and Gas Survey

⁸ Oil and Gas UK (2013), Economic Report

⁹ EY (2014), Fuelling the next generation

¹⁰ EY (2014), Fuelling the next generation

2

Overview of the sector (2014) continued

RENEWABLES

- Scotland has **25% of Europe's** offshore resource and **25% of Europe's** potential tidal energy as well as **10%** of its potential wave resource

- **11,695 people** currently in full time employment in Scotland

- **£1bn invested** in renewables in Scotland in 2013

- Renewable electricity generation currently provides **more than 46%** of electricity demand

Scottish Renewables: Renewables in Scotland

Sector outlook

Recent developments present a more challenging future outlook for the renewables industry than was predicted just a few years ago, reflecting both greater policy uncertainty and a lower level of optimism within the sector¹¹. Whilst the sector has delivered strong growth in these difficult years, policy support is critical to ensure that this continues apace over the coming decade. It has also been apparent in recent years that both major project investors such as utilities and the technology venture capitalists have substantially pulled back their investment activity in the renewable (and indeed low carbon) sector. This is partly driven by uncertainty over issues such as grid investment and subsidies, but external global factors have also played a role.

A recent study by Energy and Utility Skills (EU Skills)¹² identified a number of key influences and drivers impacting on the outlook for the renewables industry in Scotland. These include:

- **government policy and targets** – the Scottish Government has a target to generate 100% of gross electricity consumption from renewable sources by 2020. Overall carbon emissions reduction targets also act as a powerful long-term driver of investment in cleaner technology, including renewable power generation capacity
- **Electricity Market Reform (EMR)** – initiated by the UK Government, EMR is based on a Contract for Differences (CfD) model, which involves the identification of a 'strike price' for all eligible electricity generation. This is intended to give developers certainty about future tariffs and so the return on their investments
- **financial incentives** – the main economic driver of renewable energy deployment in Scotland has historically been the Renewables Obligation (RO) (Scotland). Contracts for Difference (CfD) will be the only option of support for all low carbon electricity generating technologies greater than 5MW beyond 1st April 2017.

CfDs differ from the RO both in terms of contract length and in the nature of the payments received

- **meteorological and environmental potential** – Scotland has the opportunity to become a world leader in renewables due to its wealth of natural resources. The country is home to 25% of Europe's wind and tidal resource, 10% of Europe's capacity for wave power and the EU's largest offshore storage capacity for carbon emissions¹³
- **new technology** – there remain technological challenges if the full potential of Scotland's renewable energy resource is to be effectively exploited, particularly for offshore wind and marine energy. The ability of currently very small device development companies to scale up and move from one-offs to series production in what could be a short timeframe may be challenging and will demand high-level skills in areas such as procurement, manufacturing, logistics, exporting and supplier management. There may also be current marine energy supply chain members who need to move fast to take advantage of rapidly-growing (and global) opportunities. Also, given the intermittent nature of many renewable technologies, demand management and storage are expected to be key to scaling up renewable capacity. Demand for energy storage technologies is likely to increase as renewable energy generation becomes more prevalent.

Although there is recognised potential for energy efficiency and microgeneration measures within the Scottish built environment, there is still considerable uncertainty around future levels of uptake. In addition to the above, the energy efficiency performance of buildings will play a key role in ensuring that the Scottish Government can meet future greenhouse gas emission reduction targets. The anticipated programme of work in this area will affect all areas of the built environment from new housing, retrofitting of existing houses, offices, retail developments,

industrial sites and public buildings and will require a suitably skilled workforce to ensure that it is carried out.

Skills and employment issues

EU Skills estimate that around a fifth of all people currently employed in the wind energy industry in Scotland will leave their jobs by 2020 either due to retirement or staff turnover. Whilst some of these people will move on to other opportunities within the sector, some will leave the industry altogether. Figure 2.2 shows the job roles in wind energy that are expected to be the most affected by retirements/staff turnover within industry, through to 2020.

In terms of likely future demand for skills, EU Skills¹⁴ predict that for wind, marine and hydro, this is likely to be focussed on the following areas:

- **degree-level electrical, mechanical, power systems, design and planning** – these are likely to be especially important as large infrastructure projects in renewables progress. As markets mature, it is likely that an increase in demand for graduates in STEM subjects will occur
- **experienced engineers** – the major area of recruitment difficulty is likely to be around experienced engineers (from SCQF 6 through to degree/PhD level). Engineers from electrical, mechanical, civil and design disciplines will all be in demand, as well as project engineers, planners and drawing office staff
- **data analysts and market/ commercial professionals** – people who can analyse system performance data, commercialise new technologies and develop new markets will also be in demand.

In terms of microgeneration, occupations such as energy advisers, electricians, plumbers, heating engineers, ventilation and air conditioning specialists, and building insulation installers will be required to deliver the programme of work¹⁵.

¹¹ RenewableUK and Energy & Utility Skills, September 2013 Working for a Green Britain and Northern Ireland 2013-23

¹² Energy & Utility Skills (2014), The future skills and labour demands of the Scottish renewable energy sector

¹³ Energy & Utility Skills (2013), Power Sector Skills Foresight Report

¹⁴ Energy and Utility Skills (2014), The future skills and labour demands of the Scottish renewable energy sector

¹⁵ ConstructionSkills (2014), Energy efficiency and microgeneration in the built environment, skills research for Scotland

2

Overview of the sector (2014) continued

At the moment, the overriding skills issue appears to be a shortage of sector technology-specific experienced workers. However, uncertainty around the future of the sector has led some employers appearing unwilling to address this issue by recruiting sufficient quantities of young people with a view to the longer term. Instead they are focussing on immediate needs. EU Skills comment that apprenticeships in particular appear to represent a relatively minor recruitment pathway into the sector.

Energy storage, including hydrogen and fuel cell technology, is considered an integral part of delivery in renewable energy markets. Many of the underpinning skills required to work in this area are present in existing sectors. However, a key feature of the skills development plan will be how to access these and to make those with these skills more aware of the future opportunities within the growing hydrogen and fuel cell sector in Scotland.

Similarly with microgeneration, many of the required skills already exist, but there remains a need to provide flexible skills support for environmental qualifications, as well as CPD for those in relevant professional services, such as architects.

Achieving Scotland's potential for growth of the renewables sector will also be dependent on a sufficient resource pool to develop solutions to technical challenges. Universities and colleges will be required to play a key role in this, both as collaborative partners with industry and, in the case of universities, in producing postgraduates with research & development skills. Initiatives such as the ETP Energy Industry Doctorate programme are designed to address this.

Figure 2.2: Total employment (2011)

SCQF Level	Job roles most affected by leavers (through to 2020)
Level 6	Operation & Maintenance Technician
Level 7	Operation & Maintenance Authorised Technician
Level 8	Procurement Officer Control & Instrumentation Supervising Technician
Level 9	Operation & Maintenance Engineer HSQW Adviser
Level 10-11	Senior Mechanical Engineer HSQW Manager Construction Engineering Manager
Level 12	Major Project Manager (Development) Operation & Maintenance Senior Manager Head of Construction

Source: Energy and Utility Skills (2014), The future skills and labour demands of the Scottish renewable energy sector.

- Home page
- Foreword
- Introduction
- 1 Energy SIP (2011) and achievements
- 2 Overview of the sector (2014)
- 3 Skills challenges (2014)
- 4 Developing an Action Plan (2014)
- 5 Action plan
- Data Sources & Acknowledgements

2

Overview of the sector (2014) continued

GRID AND TRANSMISSION

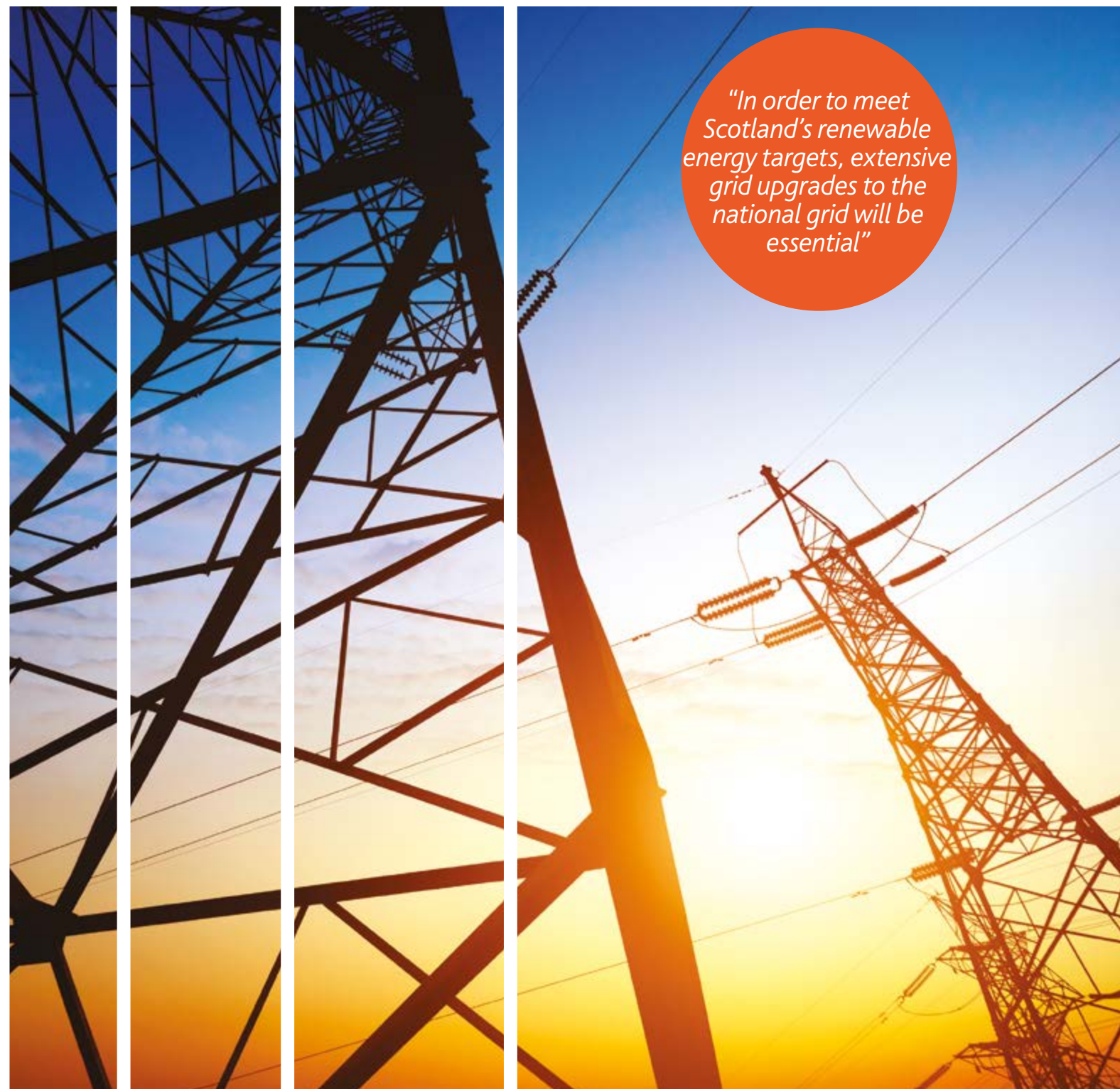
- There are **3 Transmission companies** who own and operate Transmission assets across the UK
- **5,200 people** are currently employed across Scotland in technical and engineering jobs
- There are **25,000km of cables** and pylons in the Transmission network
- To maintain current workforce levels, over **15,000 recruits** will be needed by 2022/23

National Skills Academy for Power: Transmission & Distribution Networks 2014

Sector outlook

The main drivers of change within and directly affecting the grid and transmission sector in Scotland include:

- **planned upgrades** – in order to meet Scotland's renewable energy targets, extensive upgrades to the national grid will be essential¹⁶. This will include measures to resolve some of the current barriers to grid access in remote areas, such as the Scottish islands, and more extensive connectivity to accommodate new renewable energy generation capacity
- **smart grids** – the transition to 'smart grids' is likely to be the most significant grid-based technology trend over the next five years. It has the potential to revolutionise the way in which the electricity market operates, whilst also offering consumers greater choice and flexibility
- **global demand for skills** – around the world, demand for power engineering skills is increasing as infrastructure across almost all developed countries (including the UK and US) needs upgraded. This is expected to result in increased global demand for skilled workers with experience of the electricity industry over the coming years¹⁷.



"In order to meet Scotland's renewable energy targets, extensive grid upgrades to the national grid will be essential"

- Home page
- Foreword
- Introduction
- 1** Energy SIP (2011) and achievements
- 2** Overview of the sector (2014)
- 3** Skills challenges (2014)
- 4** Developing an Action Plan (2014)
- 5** Action plan
- Data Sources & Acknowledgements

¹⁶ EU Skills (2014), The future skills and labour demands of the Scottish power grid sector
¹⁷ EU Skills (2012), Engineering-related skills shortages in the UK's electricity transmission and distribution industry: A submission by Energy & Utility Skills and the National Skills Academy for Power to the Migration Advisory Committee

2

Overview of the sector (2014) continued

Skills and employment Issues

In response to the 1,600 people that are expected to leave the grid and transmission industry by 2020 through retirement and staff turnover, it is expected that the sector will need to recruit and train more than 3,200 people. This is made up of 1,700 new recruits and 1,500 internal promotions and redeployment, which will need replacing¹⁸.

The occupations requiring the highest numbers of new recruits will be overhead linespersons, electrical fitters, general technical support activities and technical/supervisory roles. It is apparent that most external recruitment will be focussed at lower levels, with internal promotions favoured for higher level positions.

At the UK level, the single largest obstacle to the industry recruiting the necessary skills it needs to deliver capital investment programmes is the availability of suitable applicants for skilled craftsman roles at QCF Level 2 and 3 (equivalent to SCQF Levels 5 and 6)¹⁹. Issues around sector attractiveness in the power transmission and distribution industry are also well documented in EU Skills and Skills Academy research.

In 2011 and 2012, EU Skills submitted evidence to the Migration Advisory Committee on the future of skills shortages affecting the electricity generation industry (2011) and electricity distribution industry (2012). This was accepted by the Committee and a number of occupations were placed on Scotland's Shortage Occupation List. These included project managers, station and site managers, engineers (civil, mechanical, electrical, project control, control and instrumentation) and production controllers.

Degree and HND level qualifications are particularly important for the sector, where a majority of the workforce require STEM-related skills necessary for planning, operation, maintenance and upgrading of network infrastructure. As with other sectors where there are future technological challenges, there is also a need for sufficient resources with skills in applied research, development and demonstration.

In lower level skilled occupations it is predominantly health and safety, customer service and basic literacy and numeracy skills that have been found to be lacking²⁰.

CARBON CAPTURE AND THERMAL GENERATION

- Carbon Capture and Storage (CCS) is the **capture of carbon dioxide (CO₂)** from power generation and industrial emissions and its long term storage

- The offshore geography of the Central North Sea (CNS) means that CCS offers huge economic **potential for Scotland** in terms of storage and the potential for utilising CO₂ for Enhanced Oil Recovery (CO₂-EOR)

- CCS and EOR development scenarios could boost Scottish GVA by around **£3.5 billion**

Scottish Enterprise (2013), Scotland and the Central North Sea; CCS Hub Study

Sector outlook

The offshore geography of the central North Sea means that CCS could offer significant economic potential for Scotland in terms of storage and the potential for utilising CO₂ for Enhanced Oil Recovery (CO₂-EOR)²¹.

Scotland currently has two large scale CCS opportunities:

- Shell/SSE Peterhead-Goldeneye – this is a proposal for a gas power station retrofit. It secured funding for a FEED study through the DECC CCS Commercialisation Programme in 2014. This study will allow a detailed programme of engineering,



planning and financial work to finalise and de-risk all aspects of the proposal ahead of taking the final investment decisions

- Summit Power's Captain Clean Energy/Grangemouth – this proposal was also submitted for consideration under the DECC Commercialisation Programme in 2012 and is currently a reserve candidate. It involves the construction of a new-build coal power station with CO₂ capture at Grangemouth

- work is also underway within Scottish Carbon Capture & Storage (SCCS) which is the largest CCS research & development group in the UK.

Beyond 2020, other new-build and retrofit capture opportunities are possible at existing industrial/power sites close to the Forth estuary. These are largely conceptual, though initial analysis suggests technical feasibility.

Skills and employment issues

There is the potential for many more new jobs to be created in the sector, in addition to those associated with the above, but these are likely to be in the 2020s when and if the new plants come on stream. These are not yet at the planning stage and so are unlikely to happen in the period focused on by the SIP.

The skills requirements for a major programme of CCS have previously been estimated²⁰. The roll out of CCS has been significantly delayed compared to that assumed when the study was commissioned, so that the total number of CCS jobs predicted within the timeframe was overestimated. However the breakdown in terms of skills profiles should still be valid and suggests that these are likely to be focused on skilled technicians/construction workers, graduate/postgraduate engineers and trades²².

The CCS sector is relatively unknown across the wider public and so there is likely to be some awareness raising activity required in order to promote the potential future opportunities in the sector and so help attract people.

Home page

Foreword

Introduction

1
Energy SIP (2011) and achievements

2
Overview of the sector (2014)

3
Skills challenges (2014)

4
Developing an Action Plan (2014)

5
Action plan

Data Sources & Acknowledgements

¹⁸ Energy and Utility Skills (2014), The future skills and labour demands of the Scottish power grid sector

¹⁹ National Skills Academy Power (2013), A report to Ofgem on the workforce requirements of DNOs during RIIO-ED1 and RIIO-ED2

²⁰ Energy and Utility Skills (2014), The future skills and labour demands of the Scottish power grid sector

²¹ Scottish Enterprise (2013), Scotland and the Central North Sea; CCS Hub Study

²² Industrial & Power Association (2010), Carbon Capture & Storage Skills Study

2

Overview of the sector (2014) continued

NUCLEAR

- **Nuclear Sites** in Scotland are:
 - Dounreay
 - Torness power station
 - Hunterston A&B power stations
 - Chapelcross power station
- **5,280 people** employed in operations and decommissioning of nuclear power stations as well as direct supply chain
- **Over 6,500** defence employees at Faslane
- **49 different employers** based in Scotland

Nuclear Decommissioning Authority

Sector outlook

Scotland has two operational nuclear power stations located at Hunterston and Torness. Combined, they accounted for 34% of all electricity generated in Scotland in 2012. The generating life for each plant currently runs to 2023. There are a further two nuclear power sites that are currently undergoing decommissioning at Dounreay and Chapelcross.

There are no plans to develop any new nuclear power stations in Scotland, so activity will be focussed on operation and maintenance and life extension, as well as decommissioning activities, which will create opportunities for years to come. In February 2014, EDF Energy signed a Lifetime Enterprise Agreement with Doosan Babcock for operational support and lifetime extension services which will provide employment for up to 1,000 people. The UK's first new nuclear power station to be built since 1995 is planned for Hinkley, South West England. Scottish-based supply

chain companies are already working on the project, with further opportunities currently being tendered with Scottish firms.

The global decommissioning market is estimated to be worth £250bn over the next two decades, £75bn of which will be required to deliver the planned programme of decommissioning for the UK²³. This will bring opportunities for companies across a range of sectors including engineering, fabrication, construction, demolition and waste management.

Skills and employment issues

Approximately 5% of the nuclear workforce is due to retire every year up to 2025 so that by the end of 2025, over half of the workforce will have left through natural attrition. The greatest levels of attrition are expected amongst higher skilled and more experienced workers. In professional and managerial roles, two thirds of these skills pools will be eroded by 2025.

Skills shortages have been identified as the biggest risk to the future of the nuclear industry in Scotland and the UK. The National Audit Office report on decommissioning facilities at Sellafield in 2012 led many to question whether the UK has the skills needed to deal with nuclear waste²⁴. In particular, the report found that gaps in the capability of subcontractors to undertake work to the required standards contributed to delays and up to £1bn of cost overruns at Sellafield.

The emerging issues are focussed on:

- **sector attractiveness** – with no current plans to develop new nuclear power stations in Scotland, there is some concern that attracting new entrants could be a challenge. Decommissioning opportunities in the sector are mainly long-term
- **retaining existing staff** – concern that individuals currently working in decommissioning might move on before the end of their existing contracts to other longer-term opportunities
- **competition for experienced workers** – the sector faces competition from other sectors, particularly oil and gas, for experienced workers.



²³ Nuclear Decommissioning Authority

²⁴ National Audit Office (2012), Managing Risk Reduction at Sellafield

3

Skills challenges (2014)

The refreshed SIP has been produced against a backdrop of considerable uncertainty, particularly in relation to:

- **the falling oil price** – and its impact on employment and investment across the supply chain
- **UK Government policy** – specifically around agreement and implementation of Electricity Market Reform (EMR)
- **fiscal policy** – a new tax allowance for companies investing in exploration activities in the North Sea was recently announced, along with a planned review of the tax regime for the UK oil and gas sector
- **technology** – some renewable technologies, particularly those for Carbon Capture & Storage (CCS), wave and tidal, are still at the testing stage and others such as offshore are still seeking to develop further to enable cost effective production
- **future capacity/costs** – even where technology has been proven (e.g. onshore wind), there are uncertainties around potential capacity and cost implications.

It is difficult to forecast how and at what pace these issues will be resolved, making it difficult to predict likely future employment and skills requirements for the sector with a high degree of certainty.

As described in the previous section, there is uncertainty across each of the sub-sectors about the patterns of future growth due to planning, finance, and technology. Whilst this will affect timing and scale, work with other sectors, particularly engineering and chemical sciences, undertaken by Skills Development Scotland has confirmed several of the skills issues facing particular occupations operating in the energy sector. This means that we can say with some confidence that the direction of travel required is fairly clear, and consistent with the original SIP, as are the key challenges to be addressed. These are summarised from across the sub-sector descriptions in the previous section:

- **an ongoing significant demand for new labour.** In oil and gas, and grid and transmission this demand is largely to replace people who will retire or leave the sector; while in renewables and CCS it is to fill new posts in growing industries. The nuclear sector faces issues about replacement demand, but also in retention as people seek opportunities where they envisage longer term prospects
- **demand for a very similar set of skills.** Across all of the sectors there is anticipated to be significant demand for engineering and related disciplines at graduate and technician (apprentice) level. There was concern that each sub-sector would be competing for similarly qualified and experienced potential recruits, increasing the likelihood of poaching. On the upside, this means that the inherent uncertainty in each sector could be mitigated by developments in another sub-sector
- **recruitment must include experienced people as well as new labour market entrants (graduates and apprentices).** Therefore, efforts to improve skills supply to be spread across different entry routes and age groups
- **a lack of relevant experience is a key barrier to people seeking to enter the sector.** There is a strong preference to recruit people with experience (although this may not be well defined). However, there is a reluctance to offer such work experience. This leads to an asymmetry which if addressed could significantly contribute to future recruitment efforts
- **limited business co-operation to address employment and skills issues.** There is a culture of competition which leads to staff poaching, and so to higher wage levels. Co-operation between businesses to develop shared pathways and transition training/standards for people entering the sector could help to widen the labour pool and reduce wage pressures
- **limited information about future needs from business to the skills supply system.** There are good examples where large companies have engaged with the supply side to encourage training to be set up in the expectation that smaller suppliers will require staff in the future. However, this is very much the exception rather than the norm
- **challenges in attracting women to the sector.** While the numbers entering training and employment have improved, there remain marked gender differences. As the demand for people goes on it is important that the sector is able to draw on the best calibre of people that it can, regardless of gender
- **up-skilling existing employees to meet changing needs.** This is most well documented for the grid and transmission sector. However, there could also be opportunities across sub-sectors to assist people to move between related jobs, e.g. from nuclear into marine (where proximity should help) or from onshore wind to offshore wind (where development would be required but there is a good degree of transferability, and where the anticipated timing of developments would suggest this can be done)
- **research, development and demonstration** can be a key underpinning factor in the successful deployment and scale-up of new energy technologies, and in maximising cost-effectiveness for established ones. There needs to be a sufficient skills base for these activities, along with effective knowledge exchange through academic-industrial collaborations.

Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

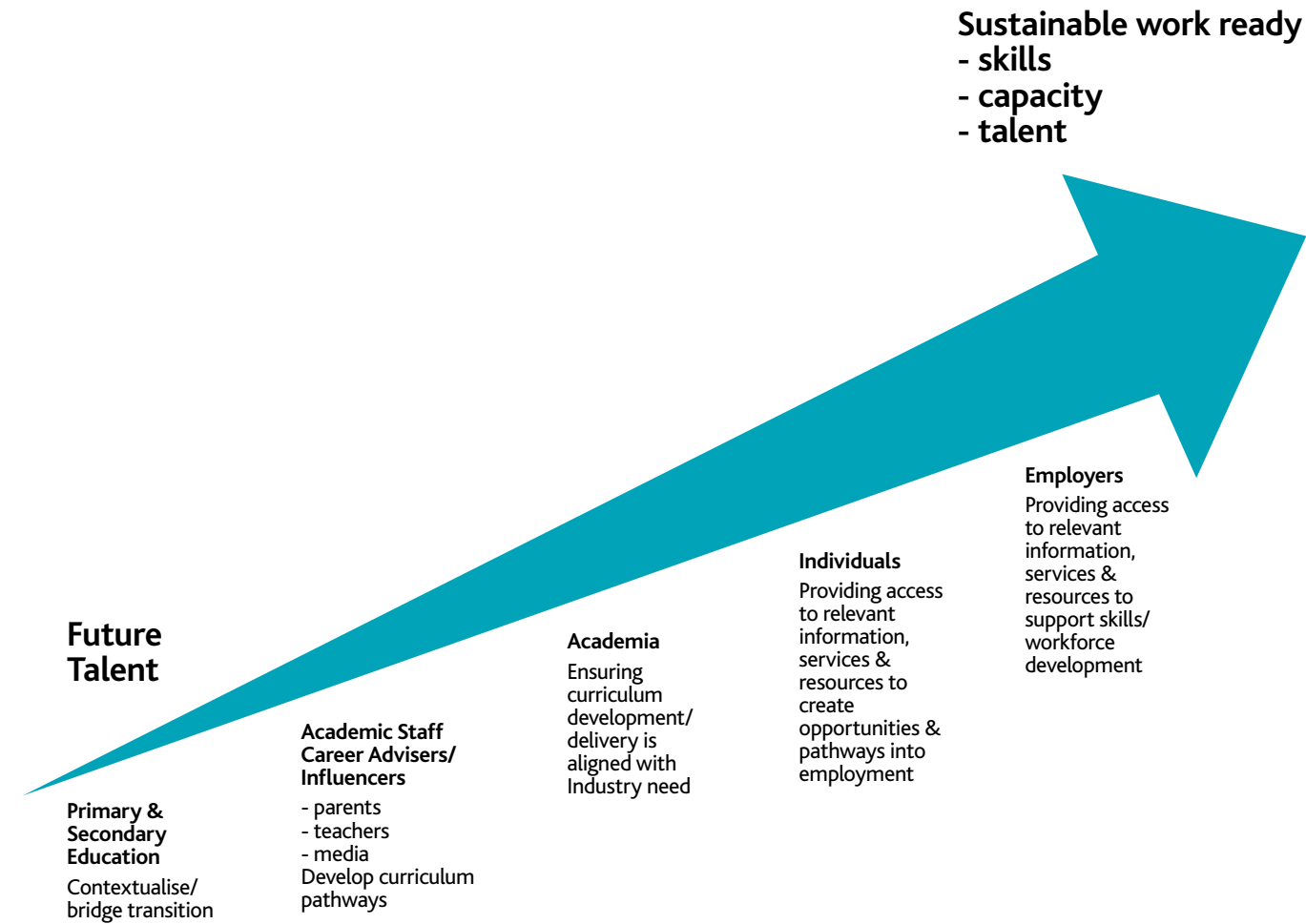
4 Developing an Action Plan (2014)

The vision of the refreshed SIP is to support the development of a skilled talent pool to ensure that the growth ambitions and opportunities for the sector in Scotland can be fully realised.

The challenges lead to a number of priorities for the SIP to address:

- raising awareness of the range of careers in the energy sector
- developing pathways to enable more people to enter the sector
- ensuring that the content and modes of delivery of education and training courses and programmes meet the needs of industry
- up-skilling to develop the existing workforce
- tackling the gender imbalance in people entering and working in the sector
- planning and co-ordination informed by good labour market intelligence.

Figure 4.1: Vision, a Supply Chain from Education into the workplace



5 Action plan

The following action plan outlines a series of suggested actions to take forward each of the aforementioned priorities.

In practice there is likely to be some flex between elements reflecting the uncertainty about the speed of development that will take place. This need for flexibility is covered in the actions below. In addition, SDS and SFC will work together with partners to respond to the recommendations of the Developing Scotland's Young Workforce report; it is likely that this will provide further support for actions behind the refreshed SIP.

Energy Skills Scotland (ESS) is a Scottish Government and industry initiative, and together with the Energy Skills Action Group, will play a key role in driving forward the implementation of the SIP priorities and Action Plan. ESS has been established to support Scotland's energy sector by bringing together employers and education in collaboration to meet the skills demands of the industry, and to enhance the skills and prospects of energy workers in Scotland. It works with partners to simplify access to the range of energy skills resources and support available within the public sector in Scotland, and supports employers to engage with education providers to make sure the skills being taught are those needed by the industry. It also helps employees by providing greater access to skills development and training in the energy sector.

Where the Action Plan refers to Industry Skills Bodies, this includes:

- National Skills Academy for Power (NSAP)
- National Skills Academy for Nuclear (NSAN)
- OPITO
- Energy & Utility Skills
- Engineering Construction Industry Training Board (ECITB)
- Oil & Gas Academy of Scotland (OGAS).



Home page

Foreword

Introduction

1

Energy SIP (2011) and achievements

2

Overview of the sector (2014)

3

Skills challenges (2014)

4

Developing an Action Plan (2014)

5

Action plan

Data Sources & Acknowledgements

Theme 1: Inspiring and preparing young people to engage in the range of opportunities provided by careers in the energy sector

Action	Description	Expected outcomes	Key partners	Start date
Develop a coherent and co-ordinated Education Strategy linked to STEM to promote energy as a career of choice	<p>A longer term/strategic approach to schools collaboration and engagement, contributing to the delivery of the sector's ambitions and the recommendations of the Commission for Developing Scotland's Young Workforce, including:</p> <ul style="list-style-type: none"> development of a supply chain from education into the workplace to ensure greater coherent activity between employers, local authorities, providers & schools/education to improve: <ul style="list-style-type: none"> awareness, understanding and attraction of careers in the energy sector focus on STEM uptake and gender diversity contextual learning through the CfE to enhance skills & work ready experience improved access to comprehensive careers support & access to employer work experience to reinforce contextual learning in schools understand Industry perceptions of skills issues and awareness/ understanding of sector careers in schools support Education Scotland Career Guidance review effective support & alignment with academia 	<p>Development of a range of Industry promotional & careers materials for schools (pupils, teachers & guidance staff), FE/HE, including emerging/niche areas, i.e. CCS, Energy Storage, etc</p> <p>Further development of MyOilandGasCareer.com, OPITO's dedicated career information site for the oil & gas industry</p> <p>An annual programme of events for pupils, teachers & students across Scotland to promote careers in the sector with focus on improving STEM uptake and gender diversity</p> <p>Promotion of career opportunities as part of Scottish Government's "Make Young People Your Business" campaign</p> <p>Support delivery of high quality interventions via Scotland's Science Centres in particular the Glasgow Science Centre Energy Exhibition</p> <p>Implementation of STEM strategy & national school interventions</p> <p>Increase in uptake of engineering and technology subjects in HE and FE</p>	ESS, Education Scotland and Industry Skills Bodies	Q4 2014

Theme 2: Developing pathways to enable more people to enter the sector with a particular focus on Youth Employment

Action	Description	Expected outcomes	Key partners	Start date
Extend delivery of pre-apprenticeship, work readiness and articulation programmes	<p>Ensure access to Certificate of Work Readiness and Foundation Apprenticeship programmes for new starts, people transitioning from other sectors, and career changers</p> <p>Within the energy and utilities sector, national traineeships and progressions programmes are being developed through the Energy & Efficiency Industrial partnership and should be reviewed against the Scottish framework</p> <p>Expansion of ESP programmes and co-investment schemes with developers, lead contractors and operators in design of programmes to support the wider supply chain</p>	Industry cites less skills issues with energy related students entering the sector	Industry,ESP, and Industry Skills Bodies	Q1 2015
Increase promotion and penetration of Modern Apprenticeships	<p>Review uptake of MAs across sub-sectors and identify those with low uptake/reporting skills shortages</p> <p>Extend and promote use of MAs for the energy sector</p> <p>Ensure availability of Renewable Technology units to all relevant MAs</p> <p>Review possibility of flexible delivery/shared apprenticeships models to assist SMEs to offer places</p>	<p>Increased uptake of Advanced Apprenticeships in the sector</p> <p>Increased awareness of MAs in Energy</p> <p>Increased SME participation and commitment to increase MA uptake for the sector</p>	SDS, Industry and Industry Skills Bodies	Q1 2015

Theme 2: Developing pathways to enable more people to enter the sector with a particular focus on Youth Employment (continued)

Action	Description	Expected outcomes	Key partners	Start date
Increase work experience and placement opportunities	<p>Maximise number of firms and students participating in placement programmes through co-ordinated delivery, including new graduates, those on pre-apprenticeship and transition training programmes</p> <p>Map and develop simulation facilities and training centres to provide genuine work experiences to include facilities for competence testing, and ensure full use and availability for extended client group</p> <p>Investigate options to provide/develop mentors to support work experience individuals in industry</p> <p>Explore opportunities with employers for work experience weeks. This has commenced in the power sector and should be explored/promoted with others as a good practice</p> <p>Continued support for the ETP Energy Industry Doctorate Programme to enhance energy industry innovation and knowledge exchange (KE) effectiveness</p>	Industry offering more placements for students, including structured work experience programmes	Industry, ESS, SDS, SFC, ESP, ETP, Industry Skills Bodies, SE, HIE	Q3 2015
Provide transition training opportunities to allow accelerated entry to the sector	<p>Work experience/simulation to be included in transition programmes together with competency testing</p> <p>Increase career awareness programmes, and assist the understanding of the work environment with those hoping to enter the sector</p> <p>Provide an introduction the oil and gas industry for individuals looking to work in technical and commercial roles through an interactive e-learning package 'Introduction to Oil & Gas Industry'</p> <p>Work with bodies such as Career Transition Partnership (CTP) to understand skills/roles within the military and other sectors and how those can be mapped across to the energy sector</p>	Development of standardised transition training frameworks for energy sub-sectors	Industry, ESS, SDS, ESP, and Industry Skills Bodies	Underway

Action	Description	Expected outcomes	Key partners	Start date
Understand skills gaps in terms of emerging technologies, including innovation, product development and internationalisation	<p>Work with relevant industry bodies/forums to understand future skills demands and develop skills programmes, qualifications and MAs as appropriate</p> <p>Work with SE and HIE to ensure skills requirements for export/international business are provided (through for example, Edinburgh University's MSc in International Sales & Marketing for Emerging Markets)</p> <p>Help employers to overcome the barriers to international talent attraction</p>	<p>Industry cite increase in ability to recruit staff with right skills for roles within emerging sectors</p> <p>Increase in range and breadth of companies undertaking product development and innovation</p> <p>International promotion of Scotland as a career destination with skilled engineers and others with niche skills</p> <p>Delivery of immigration information, workshops and one to one support to employers</p>	Industry Skills Bodies, ESP, ETP, SDS, SE, HIE	Q2 2015

- Home page
- Foreword
- Introduction
- 1
Energy SIP (2011) and achievements
- 2
Overview of the sector (2014)
- 3
Skills challenges (2014)
- 4
Developing an Action Plan (2014)
- 5
Action plan
- Data Sources & Acknowledgements

Theme 3: Ensuring the content and mode of delivery of education and training provision meets the needs of industry

Action	Description	Expected outcomes	Key partners	Start date
Provide enhanced NC, HNC/D industry-focussed programmes through Performing Engineering Operations (PEO) Level 2 SVQ	Include provision of practical skills, such as Hand Skills/PEO as part of Higher and Further Education provision as well as making available to individuals undergoing transition training, schools programmes etc	Students supported to develop work-readiness skills	ESP	Underway
Develop up to date programmes and qualifications and certificates to reflect what industry needs	<p>Continue to develop new Frameworks and National Occupational Standards/Industry Standards depending on industry demand, especially around Emerging Technologies</p> <p>Recognition of industry-approved programmes to be extended to ensure common standards are set and maintained for sectors, and training is delivered against these standards</p> <p>Investigate optimal combination of vocational and academic programmes to enhance graduate/ MA employability</p>	<p>Extension of passport programmes across sectors</p> <p>Increase in number of industry approved/recognised programmes for sectors such as the common approaches in the power sector for 'access to substations' and the Global Wind Organisation (GWO) training for off-shore wind</p> <p>Optimal learning routes through Further and Higher Education identified</p>	Industry, Industry Skills Bodies, ESAG, SQA	Q4 2014
Support the provision of vocational trainers/ lecturers	<p>Continuing to support capability and capacity building across Scotland's colleges to ensure colleges have the staff with the skills and expertise both to support learners and respond to the needs of the energy sector</p> <p>Employers to consider how they can build on good practice to release experienced staff/ equipment to training providers to enhance training</p>	Increase in numbers of employers releasing staff to develop capability of colleges to deliver up-to-date provision	Industry with ETP and ESP	Underway

Theme 4: Upskilling to develop the existing workforce

Action	Description	Expected outcomes	Key partners	Start date
Ensure appropriate and high level skills and training are available to the sector	<p>Continuation of industries' activities to develop their workforce, including around grid and transmission where existing needs have been well articulated</p> <p>Wind & Marine Network, Grid and Nuclear Training Network Groups, led by employers and employer demand, to develop relevant skills programmes</p>	Increased number of energy businesses training existing workforce	Industry, ESP, Industry Skills Bodies	Q1 2015
Increase development, promotion and take up of CPD activities across the sector	<p>ETP and ESP to support SMEs, the self employed and unemployed learn more about the sector and opportunities open to them</p> <p>ETP and ESP to support staff development in training suppliers</p>	Reduction in the number of businesses citing skills gaps in current workforce	Industry, ETP, ESP	Q4 2014
Support supervisory and management programmes for industry	<p>Support the creation of leaders in growth businesses</p> <p>Increasing participation by managers in development opportunities, i.e.</p> <ul style="list-style-type: none"> Emerging Leaders/Young Leadership Programmes Leaders of the Future 	Employers able to access supervisory and management training for staff	SE, HIE	Q2 2015
Develop an Energy Skills Scotland Gateway	Continued development of site to provide navigation and access to availability of training across Scotland, links to e-learning, simulation facilities, test centres etc, ensuring appropriate links to existing materials and websites to avoid duplication	Development of ESS website to enhance provision of services to Employers, Individuals and Schools energyskillsscotland.co.uk	ESS	Underway

- Home page
- Foreword
- Introduction
- 1**
Energy SIP (2011) and achievements
- 2**
Overview of the sector (2014)
- 3**
Skills challenges (2014)
- 4**
Developing an Action Plan (2014)
- 5**
Action plan
- Data Sources & Acknowledgements

Theme 5: Tackling the gender imbalance in people entering and working in the sector

Action	Description	Expected outcomes	Key partners	Start date
Address the gender imbalance within the sector	<p>Ongoing support to encourage diversity in the industry and support projects to get more women into engineering.</p> <p>Target females at 3 stages:</p> <ul style="list-style-type: none"> • ongoing action as part of Education Strategy to inform choices in relation to post school destinations • as part of wider initiatives to convert women SET graduates to energy • to attract women back to the sector - refresher/transition training and more flexible working practices 	<p>Increase in number of women taking up engineering and energy-related subjects in Further and Higher Education</p> <p>Improvement in attraction and retention rates for women in engineering sector</p>	Industry,ESP, and Industry Skills Bodies	Q4 2014

The Action Plan will be delivered under the guidance of the Energy Skills Action Group (ESAG), who will also have a role in monitoring its success and impact. The coordination and delivery of the SIP will be led by SDS and overseen by ESAG. Specifically SDS will facilitate the following:

- review the current role, remit and membership of ESAG and its interaction with Industry Leadership Groups
- coordinate the range of activities in support of the action plan and report on progress to the skills group
- develop a performance framework including indicators of success to monitor progress of individual actions, as well as the overall performance of the SIP
- where required, secure resources to support the implementation of activities set out in the Action Plan
- coordinate the delivery of specific projects through working in partnership with industry and public agencies to ensure that they are delivered in areas of need.

It is proposed that a formal review of the SIP and Action Plan will be undertaken 24 months after the publication of the document and a statement of progress will be produced by SDS on behalf of ESAG.

Theme 6: Planning and co-ordination informed by good labour market intelligence

Action	Description	Expected outcomes	Key Partners	Start date
Track skills and labour market intelligence, through Performance Dashboard issue to industry via ILGs	Produce skills supply/skills figures every 6 months for industry to respond to, to ensure emerging priorities, changes in market etc, are identified and responses developed promptly	Identify future skills issues and challenges within the energy sector	Industry via ILGs, ESS, ESAG, SDS	Q2 2015

Data Sources

Table 1: List of data sources

Indicator(s)	Source
Economic Output, Productivity, Business Base, Employment	Scottish Government Growth Sector Statistics
Other sources of employment estimates for the energy sector in Scotland:	
• Oil and Gas	Oil and Gas UK (2012), Economic Report
• Renewables (Wind, marine and hydro)	Scottish Renewables (2013), Employment in Renewable Energy in Scotland
• Grid and Transmission	EU Skills (2014), The future skills and labour demands of the Scottish power grid sector
• Carbon Capture & Storage	Scottish Enterprise (2014), CCS Hub Study
• Nuclear	National Skills Academy Nuclear (2014)
Modern Apprenticeships	Skills Development Scotland
College Provision	Scottish Funding Council
University Provision	Higher Education Statistics Authority
Graduate Destinations and Employment	Higher Education Statistics Authority, Destinations of Leavers Survey

Source: SQW

Publications included in desk review

Carbon Capture and Storage

- Element Energy (2014). Scotland and the Central North Sea CCS Hub Study. Scottish Enterprise
- Orion Innovations (2013). A UK Vision for Carbon Capture and Storage. The Trades Union Congress and Carbon Capture and Storage Associations
- Scottish Enterprise (2011). Economic Impact Assessments of the proposed Carbon Capture and Storage demonstration Projects in Scotland – Summary Report
- Scottish Government/Scottish Carbon Capture and Storage (2011). Progressing Scotland's CO2 storage opportunities
- Young, A., Catterson, R. and Farley, M. (2010). Carbon Capture and Storage Skills Study. Industrial and Power Association

Grid

- Department of Energy & Climate Change (2013). Electricity Market Reform: Consultation on Proposals for Implementation
- EU Skills/National Skills Academy for Power (2013). A Foresight Report for the UK Power Industry Skills: A report on the skills needs of the UK's power industry through to 2030
- National Skills Academy for Power (2013). RIIO-ED1 Workforce Requirements
- Scottish Enterprise (2012). Scottish Smart Grid Sector Strategy

Nuclear

- Macdonald, M. (2013). Radioactive Waste & Nuclear Decommissioning Policy. Scottish Government
- Nuclear Decommissioning Authority (no date). Skills for the Nuclear Industry in Scotland. PowerPoint presentation
- Nuclear Decommissioning Authority (2013). Skills & Capability Strategy
- Nuclear Decommissioning Authority (2013). Socio-Economic Investment.
- Nuclear Energy Skills Alliance (no data). Nuclear Energy Skills Alliance Annual Review 2012/13.

Oil and Gas

- Aberdeen and Grampian Chamber of Commerce (2013). Oil and Gas Survey.
- HM Government (2013). UK Oil and Gas: Business and Government Action.
- Oil and Gas ILG (2012). Oil and Gas Strategy 2012-2020.
- Oil and Gas UK (2013). Economic Report 2013.
- Robert Gordon University (2011). Labour Market Intelligence Survey. OPITO
- Scottish Oil and Gas Sector Delivery Plan 2013-16.
- Wood, I. (2013). UKCS Maximising Recovery Review: Interim Report.
- Wood, I. (2014). UKCS Maximising Recovery Review: Final Report.

Renewable energy

- Audit Scotland (2013). Renewable Energy. Auditor General.
- BVG Associates (2014). UK offshore wind supply chain: capabilities and opportunities. Department for Business, Innovation and Skills.
- CH2MHill (2013). National Renewables Infrastructure Site Evaluation. Scottish Government.
- CH2MHILL (2014). Scenario Mapping: Maximising the Onshore Benefits of Offshore Wind Development in the East and North East Regions of Scotland, Interim report. Marine Scotland.
- East Coast Developers (2013). Offshore Wind Farm Development in the Outer Firths of Forth and Tay: September 2013 Update. PowerPoint presentation.
- EU Skills (2013). Wind Energy Employment and Output Forecasts – 2020.
- EU Skills/National Skills Academy for Power (no date). United Kingdom Labour Requirements from Wind Energy Generation. PowerPoint presentation.
- EU Skills/National Skills Academy for Power (no date). United Kingdom Labour Requirements from Wind Energy Generation: Role Breakdown. PowerPoint presentation.
- EU Skills (2014). The future skills and labour demands of the Scottish renewable energy sector.
- EU Skills (2014). The future skills and labour demands of the Scottish power grid sector.
- IPA (2010). Scottish Offshore Wind: Creating an Industry. Scottish Renewables.
- Mazars (2013). UK Offshore Wind – Investment Landscape Study. Scottish Enterprise.

- National Skills Academy Power (2013). Current and future skills demands of Scotland’s renewables sector. PowerPoint presentation.
- National Skills Academy Power (2013). Wind Energy Workforce Requirements. PowerPoint presentation.
- Offshore Renewable Energy Catapult (2014). Generating Energy and Prosperity: Economic Impact Study of the offshore renewable energy industry in the UK.
- Offshore Wind Programme Board: Annual Report 2014.
- Renewable Energy Association (2012). Renewable Energy: Made in Britain. Jobs, turnover and policy framework by technology.
- RenewableUK (no date). Skills Manifesto: Skills Policy Recommendations from the Wind and Marine Energy Industries.
- RenewableUK (2013). Offshore Wind Projects Timelines.
- RenewableUK (2013). Building an Industry: Updated Scenarios for Industrial Development.
- RenewableUK (2013). Working for a Green Britain and Northern Ireland 2013-23: Employment in the UK Wind & Marine Energy Industries.
- Scottish Government (2012). 2020 Renewable Routemap for Scotland – Update.
- Scottish Government (2013). 2020 Routemap for Renewable Energy In Scotland – Update.
- Scottish Renewables (no date). Delivering The Ambition: Employment In Renewable Energy In Scotland.
- Scottish Renewables (2012). The Growth of Renewable Energy in Scotland: 2012 Progress Report.
- Scottish Renewables (2013). Employment in Renewable Energy in Scotland.

Other

- EngineeringUK (2014). The state of Engineering.
- Ernest Young (2014). Getting Ready for UK Shale.
- HM Treasury (2013). National Infrastructure Plan.
- Scottish Government (2013). Energy in Scotland: A Compendium of Scottish Energy Statistics and Information.
- Westbrook, S. (2013). Scoping and Baseline of Energy in the Highlands and Islands. Highlands and Islands Enterprise.

Acknowledgement

Skills Development Scotland would like to thank all the businesses and partner organisations who took the time to support the development of the SIP by taking in part in workshops, focus groups and consultations. We would specifically like to thank members of the Energy Skills Action Group.

February 2015