



Future Scotland

Energy

April 2013

Disclaimer

SCDI is an independent, non-aligned organisation, which maintains impartiality in matters of political debate. In this programme of work, SCDI is seeking to inform members on key economic issues relating to the debate on Scotland's constitutional future. The contents of the Future Scotland reports are not intended to reflect SCDI policy.

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Foreword

Future Scotland: Future Growth

In 2010, SCDI articulated in its *Blueprint for Scotland* the long-term vision and aspirations we maintain for a Scotland which is ambitious, enterprising and outward-looking; and which measures success in its ability to maximise its natural assets, its economic potential and its people.

For more than eight decades, SCDI has pioneered thinking on the significant economic challenges of the time, from a perspective which is independent, inclusive and representative across civic Scotland. In 2013, SCDI continues to be a catalyst for debate and thought leadership, as our economy faces the challenges of unprecedented global change and competition.

As an independent organisation with a broad membership, SCDI takes no political view on these issues for the Scottish electorate. However, the organisation's role has always been to examine and consider impartially the industrial, commercial and economic challenges and opportunities facing Scotland.

Amidst the current debate about Scotland's future constitutional options, SCDI has undertaken an enquiry into some of the key issues across the Macroeconomic and Fiscal, Europe and International, and Energy spheres. Through this work, we hope to inform and provide insights to our members and stakeholders, by the identification and analysis of the issues and evidence to be considered. By way of recommendation, my engagement with expert colleagues on the Energy Working Group has been extremely useful in developing my understanding of the major issues for the sector – and the opportunities for our economy.

As this body of work has developed, it has become increasingly clear that the issues raised in individual workstreams should not be considered in isolation, and that there is significant interrelation. For example, the implications for skills and employment in Scotland's economy has been a recurrent theme across all workstreams. Therefore, it is recognised that a change in the responsibilities of governance of Scotland would not result in a series of discrete options, but rather a range of key choices, each of which would entail opportunities and constraints and many, if not all, of which would be related to others. Ultimately, the required arrangements would be determined in negotiation and with agreement of other parties.

The work is informed by wide and in-depth consultation across SCDI's broad membership, including organisations across all sectors of the economy, in the corporate sector, SMEs, public sector agencies, trade unions, local authorities, educational institutions and the third sector. Online and face-to-face interviews have gathered substantial evidence from SCDI members and our work has also been informed by relevant statistics, statements and publications from a range of experts.

These reports are not intended to provide comprehensive answers, or to outline SCDI policy. They are, however, intended to provide a framework to inform SCDI members and encourage further discussion, including at the SCDI Forum.

I very much hope that this extensive programme of work will prove valuable to all who wish to achieve sustainable economic growth for Scotland.

Bill Drummond

Chair

Scottish Council for Development and Industry

Introduction

Scotland has an abundance of natural energy resources. Across oil and gas, thermal, renewables and infrastructure, from multinationals to SMEs, and from academic partnerships and institutions to a skilled workforce, the Scottish energy sector is recognised as world-class. In terms of economic activity, Aberdeen is the oil capital of Europe – and Scotland is at the forefront of the renewables sector. These strengths have enabled Scotland to capitalise on its indigenous assets and, increasingly, the Scottish economy has benefited from exports by the energy industry not only of its products and power, but of its expertise.

Of all the growth sectors in the Scottish economy, energy is the largest. In a period of economic challenge, SCDI believes that investment in energy offers our strongest prospect of growth. This should be combined with efforts to “anchor” the associated supply chain here in Scotland and help it internationalise. In its *Blueprint*, SCDI proposed as key priorities for the Scottish economy the maximisation of the potential of the North Sea oil and gas industry and of Aberdeen as a world-leading energy service hub, and delivering investment in renewables and Carbon Capture and Storage opportunities.

In the months ahead, there will be much debate in Scotland about constitutional change. We, and SCDI, will remain focused above all on economic change – securing investment, employment and growth. However, there is a need for impartial and informed analysis regarding the key economic issues in the constitutional debate, and SCDI has responded to the requests from members to facilitate and inform their thinking and the discussion.

This report is based on the findings of the Energy Workstream, which has been led by a group of key business and civic leaders. At no stage in this work have we, or SCDI, expressed any view on what Scotland’s constitutional future should be. What the report does is outline the key economic issues in this area, and raise a number of themes and questions that politicians and campaigners on all sides of the constitutional debate will need to consider.

We have been struck that across the energy sector there are windows of opportunity and a need for supportive and clear policies to attract the high-levels of mobile global investment necessary to realise them – for oil and gas, the need to sustain exploration and production and prevent premature decommissioning, and for electricity, the need to deliver security of supply and meet environmental targets.

Our Steering Group has taken part as members of SCDI, not as representatives of our respective organisations and, as would be expected, there were differing perspectives on some issues. However, we both believe that the report has covered the major issues and raised them in a balanced way. We would like also to thank the many SCDI members who have contributed significant additional expertise and experience.

In addition, SCDI is pleased to be working with the David Hume Institute in this area. Together, we have commissioned four papers from academic and expert authors which will focus on global energy trends, oil and gas, electricity, and consumer issues, and the implications for and of potential Scottish independence. We have shared our own work with the authors and look forward to their insights, which will be published shortly.

Trevor Garlick
Co-chairs
Energy Workstream

Bill Drummond

Executive Summary¹

Global energy demand is forecast to grow by more than one-third over the next two decades. At the same time, the global energy map is being redrawn with fundamental changes to supply and demand. This will create opportunities and challenges for the energy sector in Scotland and may have implications for the competitiveness of the wider economy.

The UK is facing significant challenges with security, affordability and decarbonisation of supply, but meeting these challenges will also create industrial opportunities. Scotland faces some similar challenges. It also has an abundance of natural energy resources and has the potential to maximise these to its economic advantage. The energy sector in Scotland, including its supply chain, workforce and academic institutions, is recognised by the Scottish and UK governments and by the European Union (EU) as a key sector of the economy.

The first section of this report gives an overview of Scotland's energy assets, both natural and created, identifies the greatest investment opportunities in the sector for the Scottish economy and highlights some of the major issues for the industry and the wider economy:

- **Offshore oil and gas** – production has been in decline since 2000, but an estimated 12-24 billion barrel of oil equivalent, 85% of which is in Scottish waters, could be recovered. Production could satisfy close to 50% of the UK's oil and gas demand in 2020 and it is expected to continue for at least another 40 years. The oil and gas sector supports around 200,000 jobs in Scotland and sales by the Scottish-based supply chain have grown to £16.3bn, with 46% attributed to overseas markets. Investment will reach £13bn this year, but costs are rising too. There is a need to maintain investment to increase the exploration effort and success rates, increase the recovery factor, and extend the life of infrastructure to defer decommissioning for as long as possible and maximise overall recovery. This will anchor the Scottish-based supply chain, even as international exports are forecast to grow to 60% of total sales by 2020
- **Electricity** – The power sector in Scotland continues to generate sufficient electricity to meet Scotland's needs and export around 20% of total generation annually. In 2011, 36.3% of Scotland's electricity needs came from renewables. Scotland has 25% of Europe's tidal power potential, 25% of its offshore wind potential, 10% of its wave power potential, and half of Europe's storage capacity for CCS – if these can be realised economically. A quarter of the UK's generation capacity, including a third of baseload capacity, will be lost over the next decade. The amount of spare generation capacity on the system could fall from 14% today to 4% in 2015/16, increasing the potential for blackouts. Scotland does not face the same level of challenge in the short-term, but a number of its thermal plants are due to close or be de-rated, and there are no final decisions yet on replacement thermal capacity. The UK has ranked highly internationally for investment in renewables, as has Scotland within the UK. Current rates of investment in renewables are insufficient to meet EU, UK or Scottish targets for 2020, with investors and developers concerned by greater uncertainty about the commitment of some governments to consumer-supported mechanisms
- **Electricity and gas networks** – £30bn will be needed to be spent in the UK over the ten years to 2020 on electricity and gas networks to replace ageing infrastructure, support the drive to a low carbon economy and connect new supplies of gas. With the need to connect renewable electricity generated in Scotland to the main centres of demand in the rest of the UK, £7bn investment in subsea cabling is planned. Scotland has exported gas to the rest of the UK, but, as North Sea gas production

¹ For all source references please see full report

declines, to maintain supplies in Scotland in the longer-term it will be increasingly necessary for infrastructure to route gas from south to north in the network

- **Affordability** - UK domestic energy prices are still relatively low compared to most European countries, but are on an upward trend, mainly due to rising gas prices, but also because of environmental and energy efficiency programmes (which the Government states will mitigate against increasing wholesale prices). Rising costs could have a significant impact on businesses and the levels of domestic fuel poverty
- **Skills** – The availability of a skilled workforce will be a major challenge for the energy industry. Combining replacement demand with new additional growth, there will potentially be a need for between 52,000 and 95,000 people with the necessary skills

The Steering Group agreed that the window for the Scottish economy to meet these challenges and capitalise on these opportunities would be time-limited and that any hiatus in the investment which is necessary would be very damaging both in the short and long-terms.

In the section on 'Policies and Powers', the report explores the growing influence of the EU on energy policy leading to a greater co-ordination of policies among Member States, which will significantly shape energy policy development in Scotland whether it remains part of the EU through the UK or joins as an independent country. Member States have committed to cutting emissions by at least 20% of 1990 levels by 2020, and in 2009 the UK committed to increasing its energy consumption from renewable sources from 3% to 15% by 2020.

Energy policy is reserved to the UK Government, and the report summarises key UK policies, some of which are of significant relevance to the debate on Scottish independence:

- **Offshore oil and gas industry fiscal regime** – following a number of unexpected increases to taxation on the industry, a range of allowances and reliefs have been introduced in order to encourage investment and increase industry certainty, with investors welcoming agreement on new decommissioning reliefs as essential
- **A harmonised GB electricity market** – with a single regulator, Ofgem, and support mechanisms working on a GB basis with costs spread across its consumer base, with over a third of the UK financial support for renewables going to Scottish projects
- **Electricity market reform (Energy Bill)** – including new mechanisms to provide support for low carbon electricity generation of £7.6bn up to 2020, backed by a tripling of funding, and to provide certainty on revenues for thermal generation to ensure security of supply, all of which would be funded from GB consumer bills
- **Review of electricity transmission charging** – cost-reflective charging leading to higher charges for generation in the north of Scotland, the review by Ofgem to ensure that charges are appropriate for intermittent low carbon generation may reduce them on the mainland, although they will remain relatively high on the islands
- **Commercialisation of technologies** – including the £1bn Carbon Capture and Storage Competition, in which Peterhead power station is one of two preferred bidders, and investment via the UK Green Investment Bank, based in Edinburgh
- **Consumer/ fuel poverty policies** – such as the UK funding for Green Deal, smart meters, Energy Company Obligations and support for electricity-intensive industries
- **Renewable Heat Incentive** – with funding to be sourced from consumers' bills

The Scottish Government has significant powers in relation to planning, the level of support for renewable technologies in Scotland, economic development, the environment and skills. The Scottish Government's target is to deliver the equivalent of at least 100% of gross Scottish electricity consumption from renewable sources by 2020 – 5GW is currently operational and this would need to grow to 16GW. It intends that, in 2020, Scotland should be generating the equivalent of twice its annual electricity needs. It supports a minimum of 2.5GW of thermal generation, with CCS demonstrated at commercial scale in Scotland by

2020, and a full retrofit across conventional power stations. It does not support new nuclear, but this does not preclude extending the operating life of existing nuclear stations in Scotland to help maintain security of supply over the next decade. It seeks increased interconnection and transmission upgrades to support the projected growth in renewable capacity, and has argued for flat-rate not cost-reflective transmission charging.

Based on these policies, the report then discusses key issues for the constitutional debate:

Oil and Gas

- **Decommissioning** – cumulative tax reliefs amount to £16.5bn for all of the UK Continental Shelf, with the majority in Scottish waters; the UK rather than Scottish Government will be a party with industry to Decommissioning Relief Deeds and it is uncertain as to what the implications could be if Scotland became independent – if parties were required to post security in the gross amount until the position became certain, this could have significant implications due to sums being ring-fenced for security over investment; ultimately, the share of the tax relief liability on decommissioning spend is likely to be a contentious issue for the two governments; companies would want reassurance that the same level of tax reliefs could be continued
- **Fiscal** – a supportive and stable taxation regime for investment; how broad consistency across the basin could be balanced with appropriate incentives; whether any outstanding tax loss positions can be recovered if an asset is transferred to a new fiscal regime; the implications of separating activities in Scottish and non-Scottish sectors for the purposes of calculating taxable income for corporation tax and supplementary corporation tax; tax administration for companies and personal taxation levels which are not a disincentive to global talent
- **Licences** – the status of existing licences for Scottish waters and cross-boundary licences; and regulatory policies, such as third party access to infrastructure, which is a key issue for recovery given the smaller average discovery size of new fields
- **Licensing/ regulatory capacity** – building-up sufficient expertise in Scotland and rUK, especially as the Department of Energy and Climate Change is under-resourced
- **The division of reserves** – from an industry perspective, certainty for the relatively small number of fields between the most likely boundaries would be important
- **Industrial Strategy** – whether or not, due to the relatively greater importance to its economy, an independent Scotland would be more interventionist than the UK
- **Oil Fund** – the operation of the Scottish Government’s proposed long-term investment/ stabilisation fund from oil and gas revenues, and the need to ensure that it does not impact on the competitiveness of the fiscal regime for investment

Electricity (and Gas Networks)

- **GB Market** – while it is almost certain that the physical market would remain, UK electricity market reforms envisage two separate revenue streams for generators, wholesale market revenue and support revenue from the administered market, funded by GB consumers, for low carbon generation – clarity on the continued availability of support revenue should Scotland become independent would be important given the importance of such mechanisms to investment in renewables and CCS; it is proposed in the Energy Bill that support revenue should be available to generators in other countries if electricity is imported over an interconnector into the UK – however, the criteria and conditions are not yet clear; a capacity mechanism to support the revenues of back-up gas generation is also proposed – clarity would be important on its availability in an independent Scotland to secure investment in thermal generation

- **Potential Costs to Consumers** – whether the costs of renewable energy targets would continue to be spread across the GB consumer base or would be concentrated on the far smaller Scottish consumer base, thereby significantly increasing their bills
- **Electricity and Gas Networks and Charging** – long-term investment programmes in the electricity networks, including the development of the offshore ‘bootstraps’ planned down both coasts, are essential to both the UK and Scottish Government’s ambitions for renewable electricity – these are regulated by Ofgem through price control review processes, and there would be a need for certainty on whether these would continue and whether they would continue to be funded by GB network charges; for gas networks, an independent Scotland would need to consider how to fund the replacement programme and (as indigenous gas supplies decline in the longer-term) import storage or greater interconnection with Europe; a critical issue would be the operation of any cross-border interfaces; Ofgem would be expected to continue with locational electricity transmission signals in England and Wales and an independent Scotland would need to consider the implications of a different approach
- **Regulation** – ensuring close cooperation with Ofgem, efficient operation and building-up technical expertise if a new Scottish regulator is created would be needed to ensure that Scotland would remain an attractive market to international investors
- **Division of Renewable Energy and Climate Change Targets** - the UK’s targets would form part of the negotiations between the Scottish and rUK Governments and the European Commission, should Scotland vote for independence and continue in EU membership, and may involve negotiations on the future of the GB market and rUK support for projects and associated infrastructure in Scotland; Ofgem and National Grid have said that renewable generation in Scotland has a key role, however, there is scepticism that the UK can meet its target at the current trajectory and the rUK might argue for a revised target with a smaller share of the existing UK target (reducing its need for imports of renewable electricity from an independent Scotland), and claim that projects which the UK has supported in Scotland should count towards the rUK renewable energy target or ignore its target. Its options include:
 - **rUK Generating More Renewable Energy** – rUK may seek to generate more from offshore wind, the Severn Barrage proposal or co-firing biomass. (Some of these projects may be more costly than imports from Scotland)
 - **rUK Importing Electricity Via Interconnectors** – The UK already has interconnectors with France, Ireland and the Netherlands, and discussions have taken place with Norway, Iceland and Denmark. A proposed new interconnector with Ireland could provide 10% of the UK’s renewable electricity targets and UK support revenues could be made available following the Energy Bill. (However, these interconnectors would be very costly)
 - **rUK Trading Renewable Energy Generation** – rUK could buy renewable electricity from any Member State to meet its target, provided it is interconnected to a member state. Scottish projects would have to compete on price for support and this may price out more expensive, nascent technologies in Scotland. (On the other hand, if a number of Member States need to buy renewable electricity in this way, Scottish projects may receive higher prices)
- **Skills** – access to highly-skilled personnel through a supportive immigration system
- **Technologies** – Scottish energy businesses and universities are highly successful at securing funding from DECC, Energy Technologies Institute, Technology Strategy Board and UK research councils; the availability of sufficient capital investment and R&D funding, for instance for CCS commercialisation at Peterhead, the Offshore Renewable Energy Catapult at Strathclyde University and the Pentland Firth and Orkney Waters Marine Energy Park would be important for economic development

- **Nuclear Generation and Nuclear Decommissioning** – agreement on waste disposal and division of decommissioning costs, estimated at £60.2bn for the UK
- **Suppliers and Consumers** – possible changes to economic and competition regulation; completion in the supplier market and whether three of the six largest suppliers would continue to operate in an independent Scotland if it was necessary to create a separate entity; the future of UK energy efficiency funding mechanisms

The report summarises the evidence which SCDI has gathered, including the positions of both Governments on the issues identified, where articulated. Based on SCDI's overarching priority of unlocking the economic prize, analysis of constitutional issues and discussions with members, SCDI poses the following key questions to both sides of the debate.

Key Questions

How does Scotland further enhance its global competitiveness for investment and maximise the long-term potential of its energy assets and industries?

How could different constitutional arrangements, including the Union and Scottish Independence, impact on the challenge above and the following questions?

1. What can be done to sustain investment in the North Sea as it deals with the challenges of a mature basin, for example to enhance the recovery factor, reinvigorate exploration success, manage costs, and facilitate the sharing of infrastructure while prolonging its operating life? At the same time, how can we help anchor and internationalise the supply chain and ensure access to the required skills for the industry?
2. How can the fiscal conditions that the industry needs to compete globally for investment be best achieved, while meeting the long-term revenue needs of government? To avoid premature decommissioning, how can the industry be assured on the future availability of funding for tax reliefs from Government? How does the licensing and regulatory regime affect the ability of the industry to deliver?
3. What can be done to attract increasing investment in the electricity generation sector in Scotland? Are there any aspects of the current regulatory framework which act as a disincentive to investment into Scotland? What can be done to grow and internationalise the supply chain and retain the economic value created in Scotland? What can be done to support less mature technologies where we have a competitive advantage?
4. What could be the demand from the rest of the UK and Europe for electricity from Scotland and on what terms might low carbon generation in Scotland be supported by financial support mechanisms in net consumer/importer countries? Are there any policy or regulatory tools at an EU or international level which Scotland should seek to use which could help open up potential export markets for its electricity? As gas is critical for heating and as a feedstock for industry, what investment might be required in storage in Scotland or greater interconnection with Europe in order to maintain long-term security of supply in the gas transmission and distribution system?
5. What can be done to ensure that Governmental and regulatory bodies have the resources necessary to support the needs of industry and consumers?
6. As business in Scotland has made very clear that it must not be placed at a competitive disadvantage due to pricing of energy supply, what can be done to secure affordable energy and avoid the costs of the transition to lower carbon supply damaging the competitiveness of Scotland as an industrial location, while reducing our relatively high levels of fuel poverty for consumers?

Overview

World Energy Outlook

Global energy demand is forecast to grow by more than one-third over the period to 2035, with China, India and the Middle East accounting for over 60% of the increase².

As the sources of new energy demand change, the sources of supply are also changing. According to the International Energy Agency, the global energy map is being “redrawn” by the resurgence in oil and gas production in the United States which is steadily changing the role of North America in the global energy trade. US oil production is forecast to jump by a quarter between 2012 and 2014 to its highest level in 26 years, with US oil imports falling by a quarter over the same period³. By 2020, the US is projected to become the largest global oil producer and is expected to become a net oil exporter around 2030 and all but self-sufficient in energy in net terms by 2035.

The map could be further reshaped by a retreat from nuclear power in some western countries, continued rapid growth in the use of wind and solar technologies and by the global spread of unconventional gas production. The International Energy Agency forecasts that by 2035 renewables will account for one-third of global electricity production, approaching coal as the leading source. However, it states that “the world is still failing to put the global energy system onto a more sustainable path”, with two-thirds of the economically viable potential to improve energy efficiency remaining unrealised through to 2035.

While BP’s World Energy Outlook projects that renewables will be the fastest growing fuel globally, it forecasts significantly slower growth than the International Energy Agency. While renewables will lead non-fossil fuels growth in the OECD, nuclear will lead in non-OECD countries (in which 93% of growth in energy consumption will take place)⁴.

The International Energy Agency states that the effects of these changes in the US will be felt well beyond the energy sector. Lower energy prices – natural gas prices in the US trade at around one quarter of prices in Europe and Asia – are spurring economic activity and enhancing the competitiveness of the US for manufacturing investment (including so-called “in-shoring” of jobs).

Analysts have different forecasts for long-term energy costs and the lower energy prices which are benefiting the US may not be possible in other markets. Rising wholesale energy costs and Government policies may lead to higher energy costs and an increased focus on affordability.

UK and Scotland Energy Consumption

Heat represents around 45% of energy use in Scotland and the UK. Electricity represents around 25% of energy use, with around 5% assumed to be for electric heating, and transport represents around 30%. Demand for electricity is growing most strongly. National Grid expects it will double by 2050.

In Scotland, industry and commercial consumption represents 47% of final energy consumption, domestic 29% and transport 24%. With the decline of the manufacturing sector

² International Energy Agency, ‘World Economic Outlook 2012’, 2012

³ Anderson, R. , ‘US oil production ‘to jump by a quarter by 2014’, *BBC News*

⁴ BP, Energy Outlook 2030, January 2013

in Scotland, there has been a fall in energy consumption by the sector. In contrast, energy consumption has risen in both the commercial and transport sectors⁵.

In 2011, gas had a 36.4% share of UK primary energy consumption, oil had 36.1%, coal had 15.5%, nuclear had 7.9%, hydro had 0.7% and other renewables had 3.3%.

Scotland's Energy Assets

Scotland has an abundance of energy resources. Its energy sector (including its supply chain, workforce and academic institutions) is recognised by the Scottish and UK governments and by the European Union as a key sector of the economy. Energy is the largest growth sector in the Scottish economy⁶.

Offshore Oil and Gas

Although production has been declining steadily since 2000, the UK is the second largest oil and gas producer in Europe and among the world's top 20. In 2011, the Scottish share of total oil production using the median line as boundary was 96%, for gas it was 52% and for tax revenues it was 94%⁷. The level of recoverable reserves in the UK Continental Shelf (UKCS) has been calculated in the range of 12-24 billion barrel of oil equivalent (boe). The wholesale value of the remaining reserves, 85% of which are assessed to be in Scottish waters⁸, has been estimated at up to £1.5tr⁹.

The oil and gas sector supports around 200,000 jobs in Scotland. Super-major, state-owned and independent production companies now have interests in the North Sea. Many companies have made Aberdeen their global headquarters. In the last twenty years, a world-class supply chain has developed, especially in North East Scotland. There are about 2,000 supply chain companies¹⁰ and sales have reached £16.3bn, with 46% attributed to overseas markets (compared to 31% ten years ago and exports recorded to over 100 countries¹¹). The Scottish based oil and gas supply chain is Scotland's largest export sector.

Grangemouth is one of four clusters at the heart of the UK's process industries sector. Since the 1970s North Sea oil and gas has provided feedstocks that have allowed Scotland to maintain a significant petrochemical manufacturing industry and plastics industry growth.

The UK Government projects that even if its target to source 15% of energy from renewables in 2020 is met, oil and gas will still meet 70% of the UK's energy needs. At present, production from the UKCS satisfies 49% of the UK's primary energy demand: 68% of oil demand and 58% of gas demand. Production has now fallen in each year since 1999, and is now less than half its 1999 levels, an average annual rate of decline of 6.3%. In 2005, the UK became a net importer of oil and gas. Production has fallen by 30% in two years, with a number of planned and unplanned shutdowns¹². Fiscal changes in 2006 reduced interest in exploration in 2008-09. This year's Licensing Round saw record interest levels¹³. Only 21

⁵ Scottish Government, 'Consultation on the Energy Efficiency Action Plan for Scotland', 2009

⁶ Scottish Government, 'Growth Sector Statistics Database', 24 January 2013

⁷ Scottish Government, 'Oil and Gas Analytical Bulletin', 11 March 2013

⁸ Wood McKenzie, Scottish Independence and the Oil and Gas Industry Key Considerations, 2012

⁹ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

¹⁰ Kemp, A., 'Constitutional Change for Scotland and the Oil and Gas Sector', 2012

¹¹ SCDI and SE, 'Survey of International Activity in the Oil and Gas Sector 2011-12', 2012

¹² Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

¹³ Oil and Gas UK, 'Oil & Gas UK Welcomes Record Interest in North Sea Licences', 23 May 2012

exploration wells per year on average were drilled over the last three years, but 130 are forecast over the next three years, the most active period for 15 years¹⁴.

Field investment is extremely high, with £13bn the estimated total for 2013. Capital investment of £44bn is expected before 2016, with 50 new UKCS fields where work is underway or could begin before 2016¹⁵. Recoverable reserves from some existing fields are also now projected to be higher than had originally been estimated, for example, production from the Buzzard field was originally forecast at in excess of 500m boe, but is now forecast to be in excess of 700m boe. The UKCS has the potential to satisfy close to 50% of the UK's oil and gas demand in 2020 if the current rate of investment is sustained¹⁶. Activity in the North Sea is now expected to continue for at least 40 years and it has been estimated that over a 30-year period field investment and operating expenditures could accumulate to £134bn and £173bn (at 2012 prices). Given the recent increased investment, UKCS production decline is expected to slow and perhaps even reverse over the next five years.

The current high investment levels are due to the development of several very large fields/projects. Oil & Gas UK projects production to grow from a low of 1.45-1.5m boe per day next year to around 2m boe per day in 2017, although it is then forecast to fall substantially unless more fields/ projects are brought forward¹⁷. The Office of Budget Responsibility (OBR) notes that UK Government forecasts are broadly flat between 2013 and 2017¹⁸.

The costs of oil and gas production in the UKCS have risen from less than £2 per barrel ten years ago to approaching £14.50 next year and are now high by international standards, with development costs a further £13.50¹⁹. Forecasts of future oil prices are uncertain. The OBR states that oil prices, as determined by futures markets, would fall from \$113 to \$93 per barrel between 2013 and 2017, with gas prices expected to follow suit²⁰. In contrast, the OECD has suggested that oil prices could rise above \$150 by 2020²¹. The rapid growth of global unconventional oil and gas production may decrease oil prices – estimates suggest that it may be 25-40% less than it would have been in 2035²². The exploration success rate is at an all-time low, fuelling concerns about activity post-2015²³.

Maintaining investment in the North Sea is absolutely critical for its long-term prospects. Any investment hiatus, caused by uncertainty, could seriously curtail its life expectancy. Oil and gas investment is highly mobile. Independent companies, backed by private equity, are least able and prepared to deal with uncertainty. Strong activity in the North Sea is essential if the oil and gas supply chain which is now competing for business globally is to be anchored in the North East (and elsewhere in Scotland) in the longer-term.

¹⁴ Oil and Gas UK, 'Activity Survey 2013', 2013

¹⁵ *Ibid*

¹⁶ *Ibid*

¹⁷ Oil and Gas UK, 'Activity Survey 2013', 2013

¹⁸ Office for Budget Responsibility, 'Economic and Fiscal Outlook', 2013

¹⁹ Oil and Gas UK, 'Activity Survey 2013', 2013

²⁰ Office for Budget Responsibility, 'Economic and Fiscal Outlook', 2013

²¹ OECD Economics Department, 'The Price of Oil – Will It Start Rising Again?', *Working Paper No 1031*, March 2013

²² PricewaterhouseCoopers, 'Shale Oil – The Next Energy Revolution', 2013

²³ Wood Mackenzie, 'UK Upstream Review', *Press Releases: Energy*, 9 January 2013

If long-term economic recovery is to be maximised, there is a need to:

1. Increase the exploration effort and success rates above recent levels
2. Invest in improving reservoir imagery, incremental projects, and Enhanced Oil Recovery Schemes to increase the recovery factor
3. Reduce unplanned downtime
4. Facilitate speedier and more efficient third party access to infrastructure
5. Extend the life of the infrastructure, particularly critical hubs
6. Control costs

Certainty from Government on guaranteed tax relief for decommissioning is key to encouraging further investment and activity, and, in consequence, long term viability.

Decommissioning activity will itself be a major economic opportunity. Over the next 30 years to 2040, expenditure on decommissioning of £35bn has been projected²⁴. However, the primary objective of the industry (and public policy) is to defer decommissioning as long as possible in order to make the infrastructure available for future small field development.

Onshore Hydrocarbons

The potential value of shale gas in Scotland has been estimated at £5bn. There are reserves in Fife, Stirling and Aberdeenshire. The estimate for the UK is £30-50bn²⁵. Some estimates of the price at which shale gas would be extracted are, however, that it would not be substantially different from the current UK market price for gas.

Scotland potentially has several centuries' worth of mineable coal reserves. Six million tonnes of coal – around a third of total UK production – was mined in Scotland in 2010. Scottish coal production has declined by slightly more than a quarter in the last decade. The decline in the rest of the UK has been even steeper²⁶. The industry generates £450m for the Scottish economy and with its wider supply chain employs around 4,000 people. The industry is under severe pressure as the low price of gas in the US is leading to exports of cheap coal, making Scottish coal uncompetitive.

Electricity

Scotland produces about 48 terawatt hours (TWh) of electricity and uses 40TWh per annum. The power sector in Scotland continues to generate sufficient electricity to meet Scotland's needs and export around 20% of total generation annually. The combined annual value of Scotland's exports to the rest of the UK and overseas from the utilities sector has risen from just over £3bn in 2007 to over £5bn in 2011²⁷.

Scotland has 25% of Europe's tidal power potential, 25% of its offshore wind potential and 10% of its wave power potential. The Scottish Government has said Scotland's practical offshore renewables resource has been estimated at 206GW and that by harnessing a third of this resource, installed offshore renewables capacity could reach 68GW by 2050²⁸. It is

²⁴ Oil and Gas UK, 'Activity Survey 2013', 2013

²⁵ Whitaker, A., 'Shale gas fracking 'worth £5bn to Scotland'', *The Scotsman*, 14 February 2013

²⁶ Scottish Government, 'Energy in Scotland: A Compendium of Scottish Energy Statistics and Information', 2012

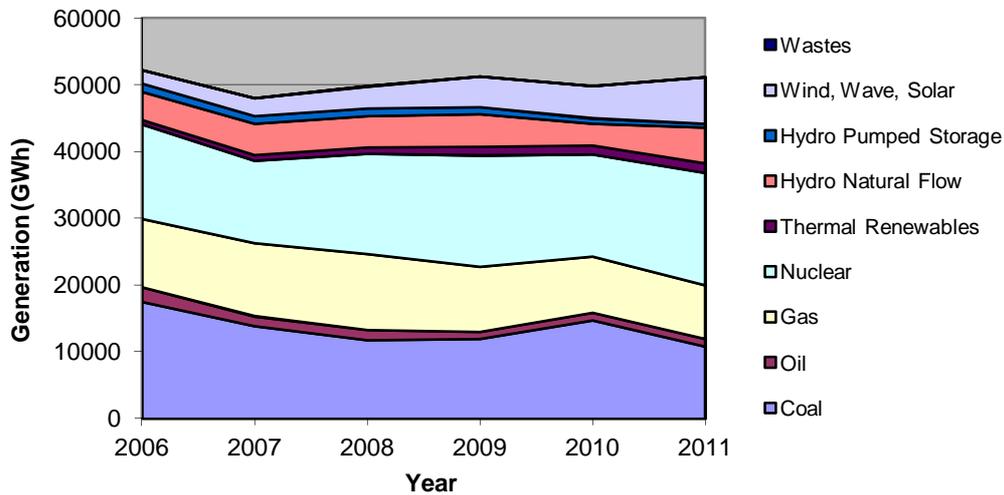
²⁷ Scottish Government, 'Scotland's Global Connections Survey 2011: Estimating Exports from Scotland', 2013

²⁸ Stafford, J., 'Making Scotland the Green Energy Capital of Europe: Interview with Alex Salmond', *Oilprice.com*, 8 August 2012

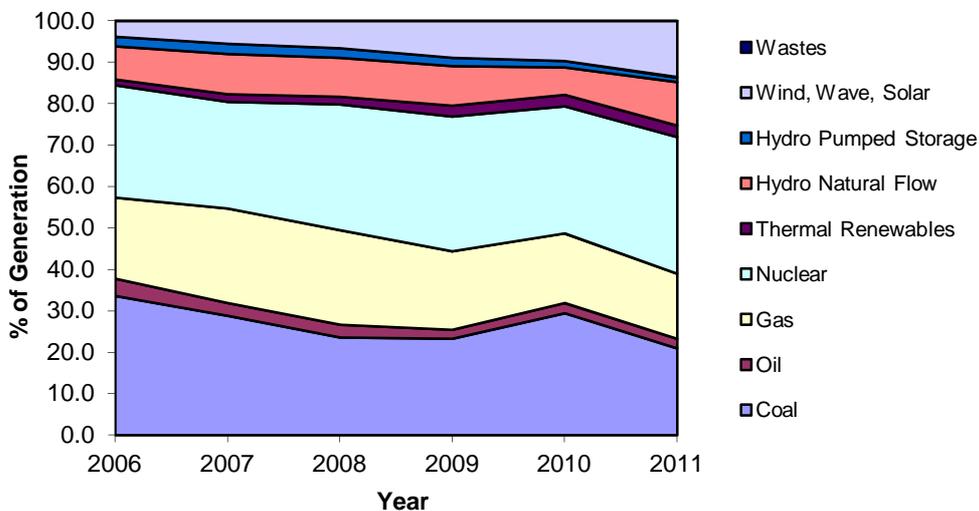
estimated that Scotland has half of Europe's storage capacity for CCS²⁹. Scotland has two CCS proposals, retrofit gas-fired at Peterhead and plans for a new coal-fired power station at Grangemouth.

The following charts show trends for electricity generation in Scotland by technologies³⁰:

Generation by Technology per Year



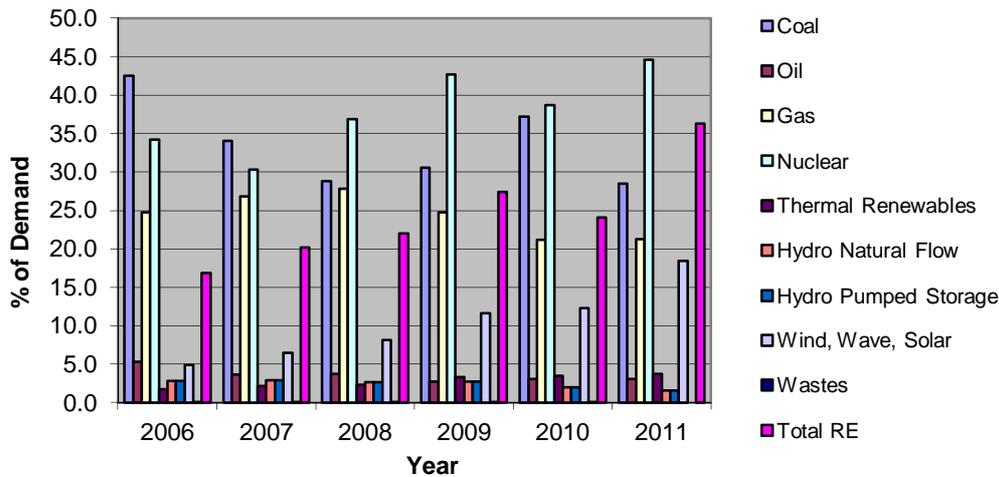
% of Generation by Technology



²⁹ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

³⁰ Department of Energy and Climate Change, Digest of UK Energy Statistics, 21 December 2012

% of Technology Compared to Demand



As of 2011, 39.9% of all UK renewables generation was based in Scotland. The Scottish Government's targets for renewable electricity generation are 31% of Scotland's demand from renewables in 2011, 50% in 2015 and 100% in 2020. In 2011, 36.3% of Scotland's electricity needs came from renewables. In the first three quarters of 2012, renewables generated 15.2% more electricity than in the same period in 2011. Scotland exported over 26% of generation in 2011, up from 21% in 2010³¹. A study by Scottish Renewables claims more than 11,000 full-time equivalent jobs in renewable energy in Scotland. Scottish Renewables has estimated that 28,000 jobs could be created in offshore wind by 2020³². Scottish Renewables has said that offshore wind developers have invested around £165m in the economy so far³³. Investment in renewable energy in Scotland in 2012 was £1.54bn, up from £757m in 2011, £1.36bn of which was in onshore wind³⁴. The Ernst & Young renewable energy country attractiveness indices rank the UK as the 6th most attractive country (it is particularly strong in offshore wind, ranked 2nd)³⁵. Industry surveys often cite Scotland as the UK's most attractive location for investment³⁶.

A quarter of the UK's generation capacity, including a third of baseload capacity, will be lost over the next decade. Analysis by Ofgem based on joint modelling with National Grid suggests that the amount of spare generation capacity on the system could fall from 14% today to 4% in 2015/16, with 10% of overall generation closing in April 2013 (under EU environmental legislation affecting coal and oil-fired power station emissions) and the risk of a shortfall in electricity is highest in 2015/16³⁷. Applying the same methodology for generation capacity in Scotland as part of the integrated GB grid, would yield an estimate for Scotland of around 35% in 2015³⁸. However, there may be longer-term issues around baseload capacity. Cockszie power station closed in 2013. ScottishPower has consent for a replacement gas-fired power station, but no final decision has been taken on the

³¹ Scottish Government, 'Energy Statistics Summary', December 2012

³² IPA Energy + Water Economics, 'Scottish Offshore Wind: Creating an Industry', 2010

³³ Scottish Renewables, 'Scotland's energy boon continues with £165m investment in offshore wind sector', 28 January 2013

³⁴ Hopwood, D., 'Investment in Scottish renewables sector doubles', *Renewable Energy Focus.com*, 28 March 2013

³⁵ Ernst & Young, 'Renewable Energy Country Attractiveness Indices', February 2013

³⁶ Pinsent Masons, *Scotland's Place in the Renewable Energy World*, 2013

³⁷ Ofgem, 'Projected Tightening of Electricity Supplies Reinforces the Need for Energy Reforms to Encourage Investment', *Press Release*, 5 October 2012

³⁸ Scottish Government, 'Energy Minister Comments on Energy Bill', *News Release*, 23rd November 2012

investment. There is a proposal for a new power station at Grangemouth. SSE has submitted an application for a new pumped storage hydro-electric power station. EDF Energy has been granted a life extension for Hunterston power station to 2023. Longannet power station is expected to close between 2020 and 2025. Torness is expected to remain open until beyond 2025 as is Peterhead, but SSE has recently announced that it is reducing electricity generation by 2GW over the next year at five UK power stations, including de-rating Peterhead, and is postponing further investment in gas-fired electricity generation until 2015. It pointed out that Ofgem had not taken reduced power generation at existing sites into account when it warned about the risk of a shortfall in electricity and that it may, therefore, have understated the problem³⁹.

The European Commission estimates that meeting the 2020 target will cost roughly €1tr to €1.2tr across the 27 Member States of the EU. Citigroup has calculated that investment is currently about half of the £100bn per year which would be required⁴⁰.

Ofgem has stated that between 2010 and 2020 up to £200bn of investment is needed in the UK, mainly from private companies, to meet environmental targets and to secure energy supplies. This is a very substantial increase on previous decades.

In the UK, the rate of expenditure is also about half of the £25bn a year required⁴¹. Scottish Renewables estimated that £1.5bn might be invested in Scotland in 2012⁴². According to the Scottish Government, its Scottish target would cost £40-50bn. This would mean upping investment from £1.5bn to £6-7bn a year in a very short time⁴³.

Global investment in utility-scale renewable energy plants declined from \$180bn in 2011 to \$149bn in 2012. Ernst & Young has, therefore, warned that “there is clearly going to be a slower pathway to growth than that originally envisaged in 2009”⁴⁴. The European Wind Energy Association has recently warned that there are increasing levels of investor uncertainty about support from European governments for renewables which will make it “unnecessarily difficult and expensive” for the EU to achieve its target⁴⁵.

SSE has stated that investors and developers are facing “much greater uncertainty which, if not resolved, will mean significantly less investment in renewables in future”. It highlights the closure of Renewables Obligation in April 2017, no mandatory EU climate change targets beyond 2020 and the risks around the construction of offshore wind⁴⁶. Confidence in investment by utility companies is essential if the supply chain is also to be confident about investments, and plans for manufacturing and assembly facilities and R&D in Scotland have slowed down. UK Electricity Market Reform (see Powers and Policies, UK Government, Electricity) is intended to improve certainty for investors and the UK Government intends that, by making offers to investors in the Autumn, developers should be able to make final investment decisions this year⁴⁷.

³⁹ BBC News, SSE boss Ian Marchant warns of the risk ‘lights going out’, 21 March 2013

⁴⁰ Energy and Climate Change Committee, ‘The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence’, *House of Commons*, HC 1912-ii, 2012

⁴¹ *Ibid*

⁴² Scottish Renewables, ‘Investment in Scottish renewables on track to top £1 billion’, 2012

⁴³ *Ibid*

⁴⁴ Ernst & Young, ‘Renewable Energy Country Attractiveness Indices’, February 2013

⁴⁵ European Wind Energy Association, ‘Governments are endangering European jobs and growth’, *Blog*, 11 March 2013

⁴⁶ Economy, Energy and Tourism Committee, ‘Inquiry into the Scottish Government’s renewable energy targets, Session 2012-13 Oral Evidence’, *Scottish Parliament*, Session 4, 17th Meeting, 2012

⁴⁷ Department of Energy and Climate Change, ‘Increasing certainty for investors in renewable electricity’, 14 March 2013

Electricity and Gas Networks

ScottishPower Ltd is the electricity transmission owner and distribution network owner and operator for central and southern Scotland. SSE is the electricity transmission owner and the distribution network owner and operator for northern Scotland. Following the introduction of the British Electricity Trading and Transmission Arrangement (BETTA) in 2005, National Grid, as the Great Britain System Operator, now operates the two Scottish transmission systems as well its own England and Wales system as one.

National Grid is the owner and operator of the UK's gas transmission network, including in Scotland. Scotia Gas Networks is the owner and operator of Scotland's gas distribution network.

Ofgem has stated that round £30bn will be needed to be spent in the UK over the ten years to 2020 on electricity and gas networks to replace ageing infrastructure, to support the drive to a low carbon economy and to connect to new supplies of gas.

National Grid has developed investment scenarios for 2030 for electricity⁴⁸ and gas⁴⁹.

For electricity:

1. In Slow Progression it has assumed a focus on extending existing plant and building new gas plants, with a much slower deployment of renewable/ low carbon generation than the other scenarios.
2. In Gone Green it has assumed a balanced approach with contributions from different generation sectors to meeting the CO₂ and renewable targets.
3. In Accelerated Growth it has assumed a faster development of low carbon generation than Gone Green leading to CO₂ and renewable targets being exceeded.

Gone Green assumes that several cables between the UK and Ireland, Holland and France will have been constructed by 2020 with around 6 gigawatts (GW) capacity. National Grid believes that the UK could be a net exporter by the early 2020s.

Ofgem is currently consulting on its decision in January 2012 to fast-track plans by Scottish network companies for up to £7bn investment in high-voltage power cabling in Scotland from 2013-21. In November 2012, Ofgem announced that it was minded to approve funding for a 2.2GW sub-sea link between Scotland and England/ Wales.

For gas supply:

1. UK Continental Shelf (UKCS) and Norwegian supplies are highest under Slow Progression due to confidence in future gas demand and a stable regime, which drives increased upstream investment. An increase in global liquefied natural gas (LNG) liquefaction leads to a significant increase in LNG imports. The high level of imports drives investment in seasonal storage and sees the UK continue to be a net exporter to the Continent.
2. Compared with Slow Progression, lower demand under Gone Green is met with lower levels of supply particularly from Norway and LNG. Under Gone Green, global LNG supplies are less plentiful, but more gas is imported from the Continent. In terms of gas storage, Gone Green assumes further development of more flexible gas storage.
3. In Accelerated Growth, the global LNG market remains tight throughout the scenario period.

⁴⁸ National Grid, 'UK Future Energy Scenarios', 2012

⁴⁹ National Grid, 'Gas Ten Year Statement', 2012

St Fergus gas terminal in Aberdeenshire receives about 20% of UK gas. In its Gas Ten Year Statement published in 2012, National Grid states that uncertainties in the future supply mix are affecting future investment on the National Transmission System. St Fergus supplies are decreasing, however rising demands (including the Moffat offtake) are expected to continue. This is compensated by supplies arriving at Southern Aggregate Entry Points. To maintain supplies in Scotland it will, therefore, be increasingly necessary to route gas south to north within the network⁵⁰.

Affordability

The price consumers pay for energy in the UK is dependent on a range of factors. About half of the bill is the wholesale cost of gas and electricity, but there is also the cost of distribution, transmission charges, government tax (VAT), environmental costs and meter provision – as well as energy company supply costs and profit.

Comparing energy prices is complicated by these factors. Ofgem has said that UK domestic energy prices are still relatively low compared to most European countries⁵¹. However, the Engineering Employers Federation has said that over the past five years, energy prices for businesses in the UK have been consistently higher than both the EU and G7 average. Since 2006, UK prices have typically been 20-25% higher than the EU-15 average⁵². Gas prices in the US are a quarter of the level in the UK.

According to Ofgem, higher gas prices have been the main driver of increasing energy bills over the last eight years. Britain enjoyed a period of falling gas prices until 2004/05. This was when the UK first imported more gas than it produced itself. As European gas prices are often linked to the oil price, gas prices in the UK have become dependent on the price of oil which has been volatile and has increased.

In Project Discovery⁵³, published in 2009, Ofgem, found that low carbon scenarios tended to result in lower bills in 2020, while greater reliance on gas, particularly if imported, exposed the UK to the risk that tight markets would increase prices which tended to result in higher bills and the possibility of significant price spikes. Ofgem now projects that gas will account for 60% of generation in 2020, compared to 30% today. Anticipated Russian supplies are being switched to China, where demand is rising by 20% a year and Asian gas costs 60% more than UK supplies⁵⁴. This analysis is challenged by some, particularly with the growth in unconventional gas production reducing some projections of rising gas prices.

The key conclusions of a new report⁵⁵ from the UK Government are:

- Energy bills are likely to continue on an upward trend, with or without policies, as a result of rising fossil fuel prices and network costs.
- Wholesale gas and electricity costs currently make up the largest proportion of an average household energy bill – around 47% in 2013.
- Transmission, distribution and metering costs account for 20%, other supplier costs and margins account for 19% and VAT 5%.

⁵⁰ National Grid, 'Gas Ten Year Statement', 2012

⁵¹ Ofgem, 'Why are energy prices rising up?', 2011

⁵² 'Support for Energy Intensive Industries' <http://www.eef.org.uk/manufacturingagenda/energy-intensive-industries.aspx>

⁵³ Ofgem, 'Project Discovery – Energy Market Scenarios', 2009

⁵⁴ The Guardian, 'Energy supplies on rollercoaster and heading downhill fast, warns Ofgem', 19 February 2013

⁵⁵ Department of Energy and Climate Change, 'Estimated impact of energy and climate change policies on energy prices and bills', 27 March 2013

- Government policies on energy and climate change account for 9%, or £112 of this bill – with £30 of this spent on renewable energy policies, including £9 on on-shore and £9 on off-shore wind.
- 85% of the rise in household bills between 2010 and 2012 was from wholesale energy costs and network costs and 15% as a result of government policies.
- Policies are estimated to be currently adding 17% to the average electricity price paid by UK households. This impact is expected to increase to 33% in 2020 and 41% in 2030.
- More than half of the energy and climate change policy costs in household bills are spent on measures to target the fuel poor and energy efficiency.
- Household dual fuel bills are estimated to be on average 5% (or £64) lower today than they would be without the energy and climate change – including products policy, buildings regulations, and energy efficiency policies – being pursued.
- Household dual fuel bills are estimated to be on average 11% (or £166) less in 2020 than they would be without policies being pursued.
- Businesses that are medium-sized users of energy currently face energy (gas plus electricity) costs that are on average 21% higher as a result of policies. By 2020 they will be 22% higher as a result of policies.
- Large energy-intensive users currently face energy costs that are on average between 1 and 14% higher as a result of policies. By 2020 the impact is estimated to be between 6 and 36%.

There is a disagreement between DECC and the industry on the costs of Energy Company Obligations. DECC has estimated these at £1.3bn, while Energy UK has estimated £2.3bn plus the costs of the programme, in which case the overall impact on consumer bills from environmental and energy efficiency programmes could be greater than £100.

There has been a broad trend away from energy intensive industries in the UK economy, but they still account for 1% of UK GDP and are a critical part of the manufacturing supply chain. Manufacturing accounts for 55% of the UK's exports⁵⁶.

North Sea oil and gas has been able to support downstream petrochemical manufacturing in the UK even though such products may be disadvantaged by distribution costs. However, UK derivatives today are exposed to global competition from low cost regions such as the United States and Middle East. Low gas prices in the US are leading to significant planned investment in petrochemicals plants. The UK derivative portfolio cannot compete with low cost product unless the upstream feeds are competitive. If feedstock costs were to rise to the same levels of the rest of Europe, these derivatives would also lose out against mainland European competitors, which have more differentiated derivatives and lower freight costs to serve the market. Production forecasts for these feedstocks from the North Sea show a marked decline at the end of this decade. Without a replacement feedstock, there will be an inevitable decline in the UK's petrochemical manufacturing industry⁵⁷.

Fuel Poverty

The usual definition of fuel poverty is the need to spend 10% or more of income to pay for fuel bills, although, following the Hills Review, DECC is consulting on a new way to measure fuel poverty. The causes are a combination of poor energy efficiency of the dwelling, low disposable household income and the high price of domestic fuel. According to the Scottish Government's annual house condition survey, the number of people in fuel poverty in

⁵⁶ CBI, 'Protecting the UK's foundations: A blueprint for energy intensive industries', 2012

⁵⁷ Energy and Climate Change Committee, 'The Impact of Shale Gas on Energy Markets, Session 2012-13 Written Evidence', *House of Commons*, ISG 10, 2012

Scotland was 684,000 in October 2011, a rise of 100,000 caused by energy bill rises of up to 18%. Extreme poverty affected 7.8% of Scottish households. Energy Action Scotland has estimated that, using the survey's figures and adding the effect of further price rises announced in autumn last year, the current number of households in fuel poverty was likely to be about 900,000. The Progress Update on the Fuel Poverty Statement states that a 5% increase in energy prices pushes 46,000 households (2% of households in Scotland) into fuel poverty.

Skills

The availability of skilled people is expected to be one of the major challenges facing the energy industry. Skills Development Scotland has said that, combining replacement demand with new additional growth, there will potentially be between 52,000 and 95,000 job opportunities in the energy sector in Scotland by 2020, 3,900 to 6,800 per year rising to around 13,000 in the peak⁵⁸. In certain areas, such as electricity networks and generation, there is a largely ageing workforce. The vast majority of demand will be filled by people already in the labour force, but there will be additional demand for apprentices and graduates. The skills system must also be primed to support a major expansion by an existing business or inward investment opportunities. The availability of sufficient people with science, technology, engineering and maths skills and qualifications will be vital.

Conclusion

There is a strong need for investment across energy production, generation, and transmission, including supply chains and workforces. This represents a significant opportunity and a major challenge – with concerns about the availability of capital and skills, potential for sectoral competition, and the risk that policy uncertainty may delay essential investment and damage the sectors in the longer-term. Confidence is a prerequisite throughout the supply chain, including for those making career choices.

Powers and Policies

Europe

EU Member States have committed to an integrated approach to climate change, unilaterally committing to cutting emissions by at least 20% of 1990 levels by 2020. The creation of a genuine internal market for energy is being implemented under the 'Energy 2020 strategy', which prioritises the free movement of energy, security of supply, technological development and international partnership. Each Member State has agreed to statutory targets for renewable energy in 2020. The 2009 Renewable Energy Directive sets a target for the UK to achieve 15% of its energy consumption from renewable sources by 2020. This compares to 3% in 2009.

EU regulation on the environment and consumer protection will have an increasingly significant impact on areas of the energy industry. Key developments include:

- Implementation of a single energy market (target end 2014), with between 30 and 40 new network codes in electricity and gas superseding GB licences and codes and increased price coupling and rules alignment in general
- Infrastructure regulations to promote Projects of Common Interest across Europe, which could overhaul offshore and super grid arrangements

⁵⁸ Skills Development Scotland, 'Skills Investment Plan for the Energy Sector', 2012

- Actions to reform the EU Emissions Trading Scheme
- New environmental legislation such as the Industrial Emissions Directive and National Emissions Ceiling Directive which will impact on the future generation mix

The EU also provides significant funding, such as to co-finance innovative low carbon technologies and cross-border energy networks.

The European Commission is proposing a new framework for 2030⁵⁹. This asks whether targets of 40% for emissions reduction and 30% for renewable energy should be set and hints at a single emissions only target. The Commission suggests that there is a need to ensure greater co-ordination of national efforts. It questions whether there should continue to be differentiated national targets taking into account factors such as the starting point and economic capacity of each country, and suggests that a concentration of increased EU financing tools on lower income countries would be a more equitable approach than varied levels of targets. The UK Government does not support a binding target for renewables as it wants a range of low carbon technologies to compete against each other. The Scottish Government previously supported a binding target for renewables to provide confidence for the renewables industry and secure commitment to tackle climate change.

In 2012, the European Commission proposed a regulation which would have replaced the existing North Sea oil and gas safety regime with a new centralised EU regime. This was opposed by the industry, the UK and other Member States and the Scottish Government, and the Commission agreed to replace it with a directive.

UK Government

Energy policy is reserved to the UK Government.

Offshore Oil and Gas

DECC is responsible for licensing, exploration and regulating oil and gas developments on the UKCS and regulating the environmental aspects of the industry including decommissioning. This includes the Fallow Initiative, the Stewardship Initiative, and the UK Government's role in third party access to infrastructure. The UK Government is now developing an industrial strategy for the supply chain.

Meanwhile, the Department for Business, Innovation and Skills is focussed mainly on the supply chain. The Department led the development of the UK Government's oil and gas strategy, published recently⁶⁰. Key issues for the strategy are the engineering skills gap, ensuring competitiveness throughout the supply chain, and research and development (R&D). A national programme will be created to retrain former military personnel. The strategy also commits the government (and the industry) to examining fabrication and other areas where the UK supply chain might be constrained and need additional support. Finally, it promises a new offshore and subsea research facility based in Newcastle, alongside other measures to promote technology.

HM Treasury is responsible for the taxation of the industry. Fields which have been developed since March 1993 are liable for both Corporation Tax at 30% and a Supplementary Charge at 32% (increased from 20% in 2011). The marginal tax rate rises to 81 per cent for fields which received development consent before mid-March 1993, these also being liable for Petroleum Revenue Tax.

⁵⁹ European Commission, 'Green Paper: A 2030 framework for climate and energy policies', 27 March 2013

⁶⁰ HM Government, 'UK Oil and Gas: Business and Government Action', 2013

In the last few years, the UK Government has introduced field allowances for small fields and challenging High-Pressure, High-Temperature, heavy oil fields, remote, deep-water gas fields to the West of Shetland, and large shallow water gas fields.

The UK Government is seeking to encourage companies to invest in getting the very most out of existing fields and infrastructure. The Finance Bill 2013 is expected to implement Decommissioning Relief Deeds, a new mechanism to ensure certainty for the industry about the UK Government's commitment to decommissioning tax reliefs.

Electricity

BETTA harmonised electricity trading across Great Britain in 2005. The Renewables Obligation came into effect in 2002 as the main support mechanism for renewable electricity projects in the UK. It places an obligation on electricity suppliers to source an increasing proportion of electricity they supply to customers from renewable sources. Generators sell Renewables Obligation Certificates (ROCs) to suppliers, which allow them to receive a premium in addition to the wholesale electricity price. Mechanisms work on a GB or a UK basis and costs are spread across a wide GB or UK consumer base. Given its comparative advantage in renewable energy resources and supportive policy, over a third of the financial support paid to renewables in the UK goes to projects in Scotland. Only a tenth of UK households are located within Scotland⁶¹.

The Banding Review for England and Wales reduced support for onshore wind from 2013-17 by 10%, guaranteed until at least 2014, but it could then be cut again if there is a significant change in generation costs. Rates of support for offshore wind will reduce as its cost comes down during the decade. Support levels for certain marine energy technologies will more than double from 2ROCs to 5ROCs per MWh⁶².

The UK Energy Bill includes measures to reform the electricity market to deliver secure, clean and affordable electricity. Feed-in-Tariffs with Contracts for Difference (CfD) will replace the Renewables Obligation. These will top-up the difference between the reference price (nominal market price) and the strike price (supported value) and will be available for all low carbon generation, with the Government, at least initially, negotiating and determining 'strike prices' appropriate to each technology, with the aim of stabilising their overall revenues. The Bill envisages a number of support mechanisms – Feed-in Tariffs; a Carbon Floor Price (which is already in operation); a Capacity Payments Mechanism and an Emissions Performance Standard. All of these mechanisms would effectively be funded through consumer bills on a GB-wide basis⁶³. A new Government owned company will act as a single counterparty to the CfDs with eligible generators. National Grid is to be responsible for delivery, including CfDs, administer the Capacity Market and provide analysis and evidence to Government.

The UK Government has reached agreement on the spending on low-carbon electricity allowed by the Levy Control Framework for 2020/21. The LCF budget is currently £2.35bn for low carbon electricity in 2012/13. This will triple to £7.6bn in real terms in 2020/21⁶⁴. The LCF includes the Renewables Obligation/ CfDs, Feed-In Tariffs and the Warm Home Discount and is effectively a Treasury cap on the surcharges on consumer bills. The

⁶¹ Economy, Energy and Tourism Committee, 'Inquiry into the Scottish Government's renewable energy targets, Session 2012-13 Oral Evidence', *Scottish Parliament*, Session 4, 21st Meeting, 2012

⁶² UK Government, 'Renewables Obligation Banding Review', 2012

⁶³ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 12, 2012

⁶⁴ Department of Energy and Climate Change, 'An Energy Bill to Power Low Carbon Economic Growth, Protect Consumers, and Keep the Lights On', 29 November, 2012

Government will take powers to set a decarbonisation range for the power sector for 2030. A decision to exercise this power will be taken in 2016 following advice from the Climate Change Committee on the Carbon Budget.

The UK Government has said that CfDs could in principle be used to support generation that is located outside the UK, where there is a clear overall benefit to the UK and it is technically possible to effectively implement and enforce CfDs. It will initially focus on establishing the arrangements for projects that can directly connect to the UK networks, either exclusively or in addition to their home network⁶⁵.

The UK Government's Renewable Energy Strategy lead scenario suggests that by 2020 about 30% or more of the UK's electricity – both centralised and small-scale generation – could come from renewable sources, compared to around 6.7% today.

The UK Government's Gas Generation Strategy states that gas will play a vital role in the UK's energy challenge over coming decades, alongside low carbon technologies. Modelling by the UK Government's Department of Energy and Climate Change (DECC) suggests that there could be up to 9GW of capacity this decade and up to 26GW of new gas plant could be required by 2030, and more overall gas capacity could be needed than the UK has today, although operating at lower load factors. This will replace older coal, gas and nuclear capacity and complement an increasing amount of relatively intermittent and inflexible generation⁶⁶. As in the longer-term unabated gas generation may not be required when there is a high-level of generation from renewables and a lack of revenues at these times may discourage investment in sufficient gas capacity now, the UK Government is proposing to introduce a Capacity Mechanism which will reward generators for having capacity available, rather than for the amount of electricity they produce, giving them certainty on a minimum long-term revenue stream.

In the longer-term, the UK Government says that CCS should ensure that gas can continue to play a full role in the decarbonised electricity sector. DECC is establishing an Office for Unconventional Gas and Oil⁶⁷. Tax allowances for investment in shale gas have been announced⁶⁸.

DECC is responsible for the 'CCS Commercialisation Programme'. This aims to drive down costs by supporting practical experience in the design, construction and operation of commercial scale CCS with £1bn capital funding, and additional support, subject to affordability, through CfDs. There is also £125m funding for R&D.

The UK Government supports the construction of new nuclear power stations and is in discussion with developers on the level and length of support mechanism from consumers which they would require to build a plant.

The UK Government has established the Green Investment Bank (GIB) capitalised with £3bn. From April 2015, the GIB will be given full powers to borrow, subject to public sector net debt falling as a percentage of GDP and state aid approval. Edinburgh will provide the corporate headquarters, asset management and back office functions. London will lead on the major transactions operations. Its priority sectors are offshore wind, Green Deal, non-domestic energy efficiency and waste.

⁶⁵ Department of Energy & Climate Change, 'Annex A - Feed-in Tariff with Contracts for Difference: Operational Framework', 2012

⁶⁶ DECC, 'Gas Generation Strategy', 2012

⁶⁷ *Ibid*

⁶⁸ HM Treasury, 'Budget 2013', 2013

Following BETTA, use of the UK's energy networks is charged on the UK basis. Transmission Network Use of System charges (TNUoS) (the charges for connecting to the transmission system) are locational while Balancing System Use of System charges (BSUoS) (a socialised charge to cover the costs of National Grid balancing the GB system) and Transmission Losses (the cost of electricity lost in transmission in the form of heat) are recovered on a uniform basis. Scotland has the highest TNUoS generation charges, especially in the North. There have been concerns that the charges for generation have been a disincentive to investment in low carbon electricity. The 'North of Scotland' zone has the cheapest TNUoS demand. The Hydro Benefit Scheme reduces charges for domestic and non-domestic consumers in the area by £50 million per year. This is funded by suppliers, and by extension consumers, across Great Britain. The UK Government has to undertake a review of the scheme every three years, but has indicated that it is likely to be retained⁶⁹.

Ofgem has recently undertaken a review of UK transmission charging. Project TransmiT recommended incremental improvements to the current charging approach. These would reduce the costs of generation on mainland Scotland⁷⁰. Ofgem is scheduled to take a decision this summer and it is possible that, following industry processes, the discount for intermittent renewables could be partially eroded and that the allocation of the costs of the planned offshore High-Voltage Direct Current (HVDC) transmission cables to generators in Scotland could increase charges relative to the current arrangements. While charges for the Western Isles and Northern Isles via proposed subsea cables would also fall, they would be six times the charges for mainland Scotland and the differential would be even greater than at present. A paper by Scottish Renewables claims that estimates of the projected annual connection charges for marine energy developments in the Pentland and Orkney waters would be £107m in 2020. This contrasts with an annual payment to the generators of £2.3m if these projects were to be built in the south west of England⁷¹. The UK Government has established the Scottish Islands Renewable Generation Group, including the Scottish Government, island authorities and the industry, to consider these issues. Proposals are expected later this year.

Consumers, Heat and Transport

Recent moves by a number of governments in the EU to cap and reduce incentives for renewable energy suggest an increasing need to balance environmental objectives with the affordability of energy for final consumers.

The UK Government launched the Green Deal to enable firms to offer consumers energy efficiency improvements to their homes, community spaces and businesses at no upfront cost, and recoup payments via a charge in instalments on their bills.

In relation to two of the main causes of fuel poverty, low disposable household income and the high price of domestic fuels, these are matters where Westminster has most control, through the tax and benefits system and through how it regulates utility companies and the surcharges it imposes on bills. Further UK Government policies for consumers include the roll-out of smart meters, reforms to tariffs and pricing, and energy efficiency mechanisms. To connect smart meters, the UK Government has tendered three area-based contracts. Scotland is part of the northern Great Britain zone with northern England. The Energy Company Obligation is a legal obligation on the largest six suppliers (each with more than

⁶⁹ DECC, 'Scheme brings £50m power bill saving across north Scotland', *Press Release*, 1 March 2013

⁷⁰ Ofgem, 'Project TransmiT – Electricity transmission charging arrangement Significant Code Review conclusions', 2012

⁷¹ Scottish Renewables, 'Swimming Against the Tide – Impact of Transmission Charging on Marine Energy Development in Scotland', 2012

5m customers) to improve the energy efficiency of households. The Scottish Government has announced funding to support Energy Company Obligation investment in free insulation and heating for poorer households⁷².

The UK Government is implementing measures to reduce the impact of policy on the costs of electricity for the most electricity-intensive industries worth £250m. It will compensate key businesses to help offset the indirect cost of the Carbon Price Floor and the EU Emissions Trading System, and increase the level of relief from the climate change levy on electricity for Climate Change Agreement participants.

The Renewable Heat Incentive will pay domestic consumers, industry, businesses and public sector organisations that generate and use renewable energy for heating. It was launched for industrial and commercial customers in 2011. Its introduction for households has been delayed until Spring 2014⁷³.

The Renewable Transport Fuel Obligation obligates fossil fuel suppliers to source a percentage of fuels for road transport from renewable sources. There are no plans to increase the amount of biofuel which must be supplied above 5% beyond 2013.

Scottish Government

The Scottish Government has powers in areas such as economic development, skills, environment and connectivity which are very important to the energy industry.

The Scottish Parliament's Climate Change (Scotland) Act 2009 sets an interim target for greenhouse gas emissions reductions of 42% for 2020 and 80% for 2050 compared to 1990 levels.

Electricity

The Scottish Government has planning powers for any new power station with a capacity of 50MW or more, and can call in any local authority decision on smaller projects for review. It also has discretion to vary the levels of market support mechanisms under the Renewables Obligation. The Scottish Government's Marine Scotland agency licences offshore renewables projects. The Scottish Government has published an Electricity Policy Generation Statement⁷⁴. Its electricity targets are:

- Delivering the equivalent of at least 100% of gross electricity consumption from renewables by 2020 as part of a wider, balanced electricity mix, with thermal generation playing an important role though a minimum of 2.5GW of thermal generation progressively fitted with CCS
- Enabling local and community ownership of at least 500MW of renewable energy by 2020
- Lowering final energy consumption in Scotland by 12%
- Demonstrating CCS at commercial scale in Scotland by 2020, with full retrofit across conventional power stations thereafter by 2025-30
- Seeking increased interconnection and transmission upgrades capable of supporting projected growth in renewable capacity.

⁷² Scottish Government, 'Millions for warmer homes', *Press Release*, 12 March 2013

⁷³ Department of Energy and Climate Change, 'Government sets out plans to cut emissions from heat', *Press Release*, 26 March 2013

⁷⁴ Scottish Government, 'Draft Electricity Policy Generation Statement', 2012

The Scottish Government has said that delivery of the headline target will require around 16GW of renewable capacity. It calculates that there is 5GW operational, with a further 3.3GW consented or operational and over 20GW in planning or scoping⁷⁵.

The policy of the current Scottish Government is that nuclear energy will be phased out in Scotland over time, with no new nuclear build taking place in Scotland. It has said that this does not preclude extending the operating life of existing nuclear stations to help maintain security of supply over the next decade⁷⁶.

The Scottish Government has set a target of reducing carbon emissions from electricity by more than four-fifths by 2030. In 2010 emissions from electricity grid activity in Scotland were estimated to amount to 347 grams of carbon dioxide per Kilowatt hour (kWh) of electricity generated. Its target is for 50gCO₂/kWh by 2030⁷⁷.

The Scottish Government announced in its Banding Review the same reduction in support for onshore wind. The band will remain at this level until 2017 unless new evidence on costs emerges, delivering certainty for investors. Support for hydro generation will remain at one ROC per MWh, not the 0.7 as proposed in the rest of the UK. It has consulted upon a new band for innovative offshore wind deployment in deep waters. In most other areas, the Scottish Government's policy will remain consistent with the UK Government's⁷⁸.

The Scottish Government welcomes the principle of providing long-term price certainty for low-carbon generation through the UK Energy Bill. It believes that the Scottish Government must have a key role in the decision-making and governance arrangements where they impact upon Scotland, specifically the design and delivery of the CfD⁷⁹. The Scottish Government has said that it will not give up the Renewables Obligation until it is satisfied that the right levels of support will be available for the technologies where Scotland has natural advantages under the new system. While welcoming the UK Government's announcement of funding under the Levy Control Framework, it says that this funding should promote emerging technologies and not mature technologies, such as nuclear. The Scottish Government says that the absence of the 2030 decarbonisation commitment will make it harder for the industry to plan for the long term. The Scottish Government is seeking an integral role in the governance and monitoring of National Grid⁸⁰.

The Scottish Government has supported a postage stamp/ fully socialised replacement for transmission charging. There would be a flat charge wherever the generation is located. But it has accepted Ofgem's proposal provided the scale of the variance in charges is compressed. It has expressed concerns about transmission charging on the islands⁸¹.

[Heat, Transport, Energy Efficiency and Fuel Poverty](#)

The Scottish Government's renewable heat and transport targets for 2020 are 11% and 10% respectively. Its ambition is for a largely decarbonised heat sector by 2030.

⁷⁵ Stafford, J., 'Making Scotland the Green Energy Capital of Europe: Interview with Alex Salmond', *Oilprice.com*, 8 August 2012

⁷⁶ Scottish Government, 'Draft Electricity Generation Policy Statement', 2012

⁷⁷ Scottish Government, 'Low Carbon Scotland: Meeting Our Emissions Reductions Targets 2013-2027 – The Draft Second Report on Policies and Proposals', 2013

⁷⁸ Scottish Government, 'Renewables Obligation Banding Review', News Release, 13 September 2012

⁷⁹ Salmond, A., 'UK Energy Bill – Scottish Government Response', 2012

⁸⁰ Salmond, A., 'UK Energy Bill', 29th November 2012

⁸¹ Salmond, A., 'Project TransmiT – Scottish Government Response', 2012

The Scottish Government's target is to reduce total final energy consumption in Scotland over the period to 2020 by 12%⁸². The Housing (Scotland) Act 2001 requires the Scottish Government to eradicate fuel poverty in Scotland, as far as is practicable, by 2016. A review of its fuel poverty strategy will be published this year.

Oil and Gas

With its economic development responsibilities, the Scottish Government, Scottish Enterprise and the Oil and Gas Industry Leadership Group published an Oil and Gas Strategy 2012-2020 in May 2011. The outcomes that this seeks are: total supply chain sales to be £30bn by 2020, international sales to be 60% of the total (or £18bn) and a rise in recovery rates with a minimum long term target of 50%⁸³.

The Constitutional Debate

Oil and Gas

Division of Reserves

The UK territorial sea and continental shelf has been divided twice for internal jurisdictional and administrative purposes: a 1987 boundary for civil and criminal jurisdiction and 1999 boundary for environmental protection and the administration of fisheries. The boundary in the latter division lies further to the north.

There has been a presumption that the median line extending from the boundary between Scotland and England would form the basis of negotiations. The median has been employed in the past in negotiations between the UK Government and other governments with continental shelves extending into the North Sea. It is also currently employed for purposes of the demarcation of Fisheries Management responsibilities between the Scottish and UK governments.

It has been calculated that the fields located in the area between the two boundaries account for 180m boe or 2% of total UK commercial reserves. While not insignificant in overall terms, disruption to the operation of these specific fields from any dispute would be the major issue⁸⁴.

International law is not definitive on this issue and other international treaties could potentially support alternative boundaries. It should be noted that departures from the median line principle have occurred in various settlements around the world, including judgements made by the International Court⁸⁵. Assuming an Independent Scotland and Westminster would consent to having the International Court of Justice decide the course of any disputed boundary, similar cases have taken at least three, and sometimes more than 10, years to conclude.

The future constitutional status and aspirations in relation to oil and gas revenues of Shetland and Orkney would also need to be clarified.

⁸² Scottish Government, 'Conserve and Save: Energy Efficiency Action Plan', 2012

⁸³ Scottish Enterprise, *Maximising Our Future – Oil and Gas Strategy 2012-2020*, 2012

⁸⁴ Wood Mackenzie, 'Scottish Independence and the Oil and Gas Industry – Key Considerations', 2012

⁸⁵ Kemp, A., 'Constitutional Change for Scotland and the Oil and Gas Sector', 2012

International Treaties

The UK is a signatory to international treaties which would not be automatically inherited to an independent Scotland such as the UN Convention on the Law of the Sea and the OSPAR Convention on decommissioning liabilities and the maintenance of pipelines and cables. The Scottish Government would need to sign them.

Licences

Early clarification is needed on the status of the licences already awarded in what would become the Scottish sector is required. Currently the oil companies hold long-term licences awarded by DECC on behalf of the UK Government for exploitation of hydrocarbons from the UKCS. An independent Scotland would probably honour those licences which apply to the Scottish sector. A licence can relate to several blocks and it is possible that some would be in the Scottish sector and some in the rUK. Replacement licences for them may have to be issued by both governments.

An independent Scotland may decide to reconsider and change certain regulatory policies. An important example could be those relating to third party access to infrastructure⁸⁶. This is especially important in a mature basin, given that the smaller average discovery size means that the costs of new dedicated new pipeline infrastructure are often uneconomic. It is in the interests of developers of these fields that there is cheap and easy access to existing infrastructure. However, the owners of the infrastructure face higher costs as it ages and volumes drop and, therefore, argue that they need to recover these costs from the developers of projects which are seeking to tie-in. There can also sometimes be practical difficulties in hook-ups. To maximise overall recovery from the basin, an independent Scotland may seek to exercise greater control over access arrangements.

Currently the Scottish Government does not possess an organisation to issue licences and regulate activities in the UKCS and one would need to be established. The vast amount of information relating to the fields and acreage within the Scottish sector would need to be transferred to the new Scottish authority. It would also gain responsibilities for other important initiatives and activities undertaken by DECC. While some of this work is currently undertaken in the DECC office located in Aberdeen⁸⁷, DECC is itself under-resourced in personnel and a much broader range of technical expertise would require to be built-up by the Scottish Government. The industry would also need the same technical expertise to continue to be available in the rUK.

Taxation

While oil and gas revenues are very important to the UK, they would be even more significant to the fiscal position of an independent Scotland.

Clarification of the operation of the special taxation system applicable to the upstream oil and gas industry in what would become the Scottish sector would be needed.

The UK shares the cost of capital allowances. The capital allowances to develop fields are not set against tax and that reduces the tax take at that time. Scotland might become

⁸⁶ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

⁸⁷ *Ibid*

independent before the UK gets tax payment from these fields meaning that the rest of the UK does not benefit from these capital allowances⁸⁸.

Corporation Tax and the Supplementary Charge are levied on the basis of a ring fence covering all of the UKCS (and onshore upstream activities). This means that allowances relating to eligible expenditures in one field can be set against income in other fields for tax purposes. This can mean that an allowance emanating from expenditure in what would become the rest of the UK sector can currently be offset against income arising from within the Scottish sector. After independence there would be a need to separate the activities pertaining to the Scottish and non-Scottish sectors for purposes of calculating taxable income and tax payments. Exchange of information between the UK and Scottish Governments would be necessary. A considerable expertise in this tax area would have to be developed.

Currently gas is exported from fields in pipelines in what would become the Scottish sector to Teesside and Bacton in England. The pipelines cross what would become the boundary line. The tax status of the pipelines would require clarification. Existing UK legislation dealing with exports by pipeline could be the basis of an agreement⁸⁹.

At present, for tax purposes in the North Sea it is necessary to have an office located in the UK. Companies may have to designate establishments with central management and control based in Scotland and rUK to ensure that effective taxation could be levied on activities in both sectors and deal with Scottish and rUK tax authorities.

There could be a need for a tax treaty between Scotland and rUK and other countries important for petroleum investors e.g. the USA, Canada, and France⁹⁰.

Agreement could be needed on personal taxation issues for offshore workers which may arise where an accommodation platform services both the Scottish and rUK sectors. The competitiveness of personal taxation in an independent Scotland would have a bearing on the Scottish industry's ability to retain and attract what is a skilled, well-paid and mobile workforce.

Health and Safety

The health and safety issues relating to the UKCS are currently the responsibility of the HSE which is a UK body. If Scotland becomes independent, responsibility for the Scottish sector would have to be undertaken by a comparable Scottish body, or the Scottish Government would need to contract the UK HSE to provide the services. If the former, considerable expertise would be required in these responsibilities. The HSE already has an office in Aberdeen which conducts work relating to the UKCS⁹¹. If the latter, there would be some risk of misalignment between responsibility for policy and regulation, although, with the EU significantly influencing policy across Member States, there may not be scope for different policies in an independent Scotland and rUK.

⁸⁸ *Ibid*

⁸⁹ *Ibid*

⁹⁰ *Ibid*

⁹¹ *Ibid*

Decommissioning

The cost of decommissioning that would be needed by 2040 comes to about £35bn, the bulk of which would be in what would become Scottish waters because the most extensive platforms are in the East Shetland basin. The cumulative tax reliefs under the present tax system amount to £16.5bn for all of the UKCS. For Petroleum Revenue Tax, the rules are that decommissioning losses in a field are clawed back indefinitely against earlier Petroleum Revenue Tax profits and tax refunds made. For Corporation Tax and Supplementary Tax, the claw back can be permitted to 2002. A complex situation on assigning costs would arise when decommissioning takes place in Scottish waters after Scottish independence but the claw-back extends to a pre-independence date – whether the rUK would be liable for all the costs incurred pre-independence and an independent Scotland would be liable for the costs post-independence or whether either of them would be liable for all the historic costs⁹².

Decommissioning Security Agreements ("DSA") are commercial agreements that provide a means of securing decommissioning liabilities in respect of oil & gas installations and infrastructure which may be called upon by beneficiaries in the event of default or failure to pay decommissioning costs. To date, companies have posted security under DSAs on the basis that tax relief from the UK Government will not be available. The 2012 Budget sought to address this issue by introducing enabling legislation and the Decommissioning Relief Deed.

Decommissioning Relief Deeds are the proposed contracts to be entered between the UK Government and companies to provide assurance on the tax relief which they would receive when decommissioning assets, in the event of a default by a co-venturer. Once these deeds are in place, it is envisaged that DSAs will then allow for parties to provide security in respect of their decommissioning liabilities on the basis that the tax relief will be available if they default.

However, as the Scottish Government will not be a party to these Decommissioning Relief Deeds, it is uncertain as to what the implications could be if Scotland becomes independent. If parties are required to post security in the gross amount until the position becomes certain again, this could have significant implications in the North Sea due to sums being ring-fenced for security over investment. Merger and acquisition activity could be reduced, with smaller operators particularly affected.

For companies, their investors and insurers, confidence that Government will fund tax relief on North Sea decommissioning is essential in order not to lead to premature decommissioning and sub-optimal recovery. This requires certainty on how liabilities will be assigned and the long-term fiscal position of the government(s) providing tax relief, including its capacity to cope with any volatility in its revenues.

Industrial Strategy

The Scottish Oil and Gas Strategy, developed by the Scottish Government, Scottish Enterprise and the industry and published last year, has been well-received by industry. The UK Government has recently published the UK Government's Industrial Strategy for the Oil and Gas Industry. The Scottish Government has suggested that because the oil and gas industry would be 20 times more important to the economy of an independent Scotland than to the UK economy, maximising the long-term benefits would be a higher priority and support for the industry would improve. Given its relative importance, it has been questioned whether an independent Scottish Government would allow market forces to work as they do in the

⁹² Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

UKCS or intervene more often as happens in Norway. A new Scottish Government could place increased obligations on oil and gas operators in the Model Clauses incorporated into oil and gas licences.

Norway has a Ministry of Petroleum and Energy. Responsibilities in the UK are split across HM Treasury, DECC and the Department of Business, Innovation and Skills.

Statoil was created in 1972 by the Norwegian Parliament, and the principle of state participation in each production licence was established. From 1985, the state's participation in petroleum operations was split in two, one linked to the company and the other becoming part of the State's Direct Financial Interest (SDFI), an arrangement in which the state owns interests in a number of oil and gas fields, pipelines and onshore facilities. Each government take is decided when production licences are awarded and the size varies from field to field. The state pays its share of investments and costs, and receives a corresponding share of the income.

Oil Fund

The principle behind an oil fund is that oil and gas reserves form an important part of a country's capital stock and their depletion constitutes a diminution of that stock. In order to maintain the nation's capital stock, revenues from oil production should be reinvested in a fund which would generate income from investments in perpetuity. The fund's rules should restrict access to the capital (as opposed to the income). The UK has never had an oil fund and revenues have instead been used to fund annual expenditure⁹³. Within the UK, Shetland successfully negotiated its own fund.

There are a number of funds around the world with different rules. In Norway the fund invests the oil monies in securities of various types, generally outside the country. The investments of the large existing funds around the world are to a considerable extent in financial assets, but investment in real assets is also made.⁹⁴

The First Minister has proposed that about a tenth of oil and gas tax revenues - about £1bn a year - could be invested from "when affordable" to create a £30bn oil fund over thirty years. This would be invested to generate income which could be used when oil revenues were lower than expected and benefit future generations⁹⁵.

In recent years, Scotland, in common with the UK as a whole, has had a substantial budget deficit. There is a question about how an oil fund could be established without reducing public expenditure or increasing taxation, probably on the oil and gas sector. The £30bn fund appeared to assume a 4% rate of return, with a 2% inflation rate. This was based on what the Norwegian fund was targeted to deliver. However, since 1998 the maximum rate of return achieved by the Norwegian fund has been 2.9%⁹⁶. The Governor of the Norwegian Central Bank said recently that they expected the future real return should be 3% and not 4% based on its past performance⁹⁷.

⁹³ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

⁹⁴ *Ibid*

⁹⁵ Salmond, A., 'Opportunities for Scotland', *Speech presented at London School of Economics*, 15 February 2012

⁹⁶ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

⁹⁷ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

Scottish Government's Position

The Scottish Government has said that: "There will...be a presumption in favour of adopting all existing aspects of the North Sea fiscal and regulatory regime as currently administered. Our Oil and Gas Strategy demonstrates how the more challenging fields can be developed and we would work with the industry to enhance the fiscal regime post-independence to achieve this goal"⁹⁸. On the availability of tax relief for decommissioning, the Scottish Government has said that: "Following independence there would be a negotiation between the Scottish and UK Governments to ensure that UK public sector assets and liabilities, including nuclear decommissioning and tax relief on North Sea decommissioning, are shared fairly. The Scottish Government will continue to offer the same tax relief as currently proposed by the UK government associated with decommissioning North Sea facilities in Scottish waters post-independence. There will therefore be no impact on the future value of decommissioning tax relief received by North Sea operators"⁹⁹.

It is worth noting that in 2011 (following the increase in Supplementary Corporation Tax in the UK Budget 2010), the Scottish Government published an options paper on the fiscal regime¹⁰⁰. This made proposals to the HM Treasury on changes to taxes for the UKCS:

- Investment Rate of Return Allowance: The Scottish Government's preferred option, this guarantees companies a minimum rate of return on their investment before the Supplementary Charge is levied. It allows companies to carry forward undeducted expenditures to set against future profits at an agreed interest rate.
- Investment Uplift Allowance: Similar to the above, although the company's investment costs are up-rated by a fixed proportion, i.e. 10%, rather than on an annual basis.
- Extended Field Allowances: Indirectly linked to a field's investment costs, these reduce the amount of tax a company has to pay on its profits but are less flexible than the other options. For example, companies can only receive them if they are operating in very specific locations or are trying to extract specific types of oil or gas deposits.

The Scottish Government has not yet specified what additional enhancements it might discuss introducing should Scotland become independent and how it would balance these with stability and consistency in taxation across the UKCS.

Enhanced Devolution

Professor Alex Kemp of Aberdeen University has pointed out that many countries around the world have greater devolution of responsibilities for, and revenues from, oil and gas or other minerals than in the UKCS. Options for the UKCS could include¹⁰¹:

1. Sharing of tax revenues between Scottish and UK governments with rUK Government remaining in charge of tax and other policies as at present
2. Devolution of tax policy relating to a defined Scottish area of UKCS to the Scottish Government

⁹⁸ Ewing, F., 'Letter to Tim Yeo MP' House of Commons Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Supplementary Written Evidence', 2012

⁹⁹ *Ibid*

¹⁰⁰ Scottish Government, 'North Sea oil and gas investment', *News Releases*, 20 June 2011

¹⁰¹ *Ibid*

3. Devolution of licensing and related policies as well as tax policy to Scottish area of UKCS to Scottish Government
4. Sharing of oil tax revenues is common in countries with more than one tier of government, particularly those with federal structures. The oil and gas may be located in the territory, or adjacent to the territory, of the lower tier government. Sometimes, but not always, the lower tier government has control over the mineral rights within its jurisdiction. Sharing on the above basis reflects the derivation principle.

Electricity

GB Market

The GB electricity sector is highly integrated and regulated. Security of supply issues are urgent and there is a strong need to increase the pace of investment, especially in low carbon technologies if renewable energy and climate change targets are to be met and the potential economic benefits realised.

It is almost certain that there would continue to be a shared GB national grid with an independent Scotland and rUK, subject to the need of regulators, via a combined independent System Operator to co-ordinate, control and monitor the electrical power system.

UK electricity market reforms envisage that low carbon generators would enter into CfDs against a market reference price. This effectively means that generators have two separate revenue streams:

1. The revenue that they make from selling that generation on the market ('market revenue') – this comes from the buyers wherever the power is sold and is highly unlikely to be affected by Scottish independence; and
2. The revenue from the CfD ('support revenue') – there are greater uncertainties about the future of the administered market if Scotland became independent.

The precise support from ROCs for renewable generation varies. But, as an illustration of the importance of support revenue to the viability of low carbon generation, an offshore wind farm could expect to receive £150 per MW hour, made up of £100 of ROC support and £50 of the wholesale power price; onshore wind could expect to receive £100 per MW hour, half from ROC support and half from the wholesale power price¹⁰². The future of the subsidy regime is therefore critical to companies in making decisions about major investments in renewables, especially for relatively expensive technologies; offshore wind, wave and tidal¹⁰³.

The UK Government has said that rUK consumers may start to question whether they should pay for subsidies for electricity generated in an independent Scotland¹⁰⁴. There may be calls to split the Levy Control Framework funding available to generators for low carbon generation.

¹⁰² Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-ii, 2012

¹⁰³ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 05, 2012

¹⁰⁴ Economy, Energy and Tourism Committee, 'Inquiry into the Scottish Government's renewable energy targets, Session 2012-13 Oral Evidence', *Scottish Parliament*, Session 4, 21st Meeting, 2012

There are questions about what would be the UK Government's support for:

- Existing generation commissioned in Scotland prior to the announcement of a referendum
- Generation commissioned in Scotland between the announcement of a referendum and the announcement of its outcome

ROCs in Scotland have been issued separately from the rest of the UK. This may raise questions about their treatment by Ofgem following independence. Consumers in the rest of the UK fund 11/12th of the value of ROCs in Scotland.

- If the outcome is Scotland's independence, generation commissioned in Scotland after the outcome

Following independence and the successful conclusion of negotiations with the EU and Member States, Scotland would become one of a number of EU states with electricity interconnectors to rUK – at least including Ireland, France and the Netherlands, all of whom produce a higher proportion of their energy needs from low carbon sources than rUK currently does¹⁰⁵.

It is proposed, in principle, in the Energy Bill that CfDs should be available to generators in other countries if electricity is imported over an interconnector into the UK. However, the criteria and conditions have not yet been stated. CfDs could become generally available or remain agreed on a case-by-case or country-by-country basis.

The Scottish Government's electricity policy envisages a continued need for 2.5GW of thermal generation. Given the planned closures and de-rating of existing plants, this would require investment in new generation. The application of the Capacity Mechanism being introduced in the UK Energy Bill, including how the auctions would work between an independent Scotland and rUK, would, therefore, be important for the operation of and investment in Scottish thermal plants. Clarity would also be needed on how the Emissions Performance Standard would apply and whether the Carbon Price Support would apply in an independent Scotland.

The Scottish Government supports a single GB market and a "new strategic energy partnership". It has said that "to ensure stable prices for customers and to promote investor confidence, we propose continuing with the new energy market arrangements under constitutional reform, and do not envisage establishing a separate regime in an independent Scotland. This will be of mutual benefit with GB customers and is consistent with the increasingly integrated European energy markets. Under these arrangements, Scotland would have a voice in the market governance [as a consultee]"¹⁰⁶. It highlights that the UK Government has stressed the need for co-operation between Ireland and the UK and that the Scottish and UK governments are working on greater interconnectivity with other countries. The Scottish Government points to the interests of rUK companies in Scottish projects¹⁰⁷.

In terms of generators' views, SSE has said that the referendum process, "increases the risk of regulatory change and legislative change with regard to the electricity and gas industry in Scotland because it means there is additional uncertainty about the future. This additional

¹⁰⁵ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', House of Commons, SCO 12, 2012

¹⁰⁶ Sunday Herald, 'UK to control green subsidies in an independent Scotland', 27 January 2013

¹⁰⁷ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', House of Commons, HC 1912-i, 2012

risk will apply up to the date of the referendum and, should the result be a vote in favour of a change in Scotland's status, will continue until there is a binding agreement on all of the issues that could affect the electricity and gas industry in Scotland. The practical application of this policy means that when making final decisions with regard to possible new investments in Scotland, which will have to be adequately remunerated if they are to be made, SSE will have to decide whether the additional risk of regulatory and legislative change with regard to Scotland means it should apply a risk premium to the investment proposal. If it concludes that a risk premium should be applied, it will have to determine what that premium should be; and, if a risk premium is applied, it will have to assess the impact of that premium on whether or not to proceed with the investment proposal"¹⁰⁸. In contrast, Iberdrola, owner of ScottishPower, has said that the referendum on Scottish independence is not influencing its investment decisions.

In a survey of companies, a third of respondents said that uncertainty over the constitutional position of Scotland within the UK has caused a delay in their investment decisions, while 60% said that it has not. A change in the constitutional position of Scotland within the UK would cause 22% of them to consider it more favourably in their investment decisions. However, 70% said that it would not¹⁰⁹.

Case Studies

There is a high degree of pan-European trading in the electricity and gas market across interconnectors, even with very different regulatory and tax regimes¹¹⁰.

The All-Island Irish arrangements and the single Iberian energy market are often identified as examples of integrated international markets. Nord Pool is an electricity pool between four of the Scandinavian countries. Support mechanisms for renewables are kept separate between Ireland and Northern Ireland in All-Island wholesale electricity market. Ireland has its own national targets and support mechanisms. Northern Ireland is part of the UK targets and support mechanisms¹¹¹.

Nor do Denmark and Germany have a single support mechanism. Denmark sells power to Germany at the wholesale power price in Germany. For renewable energy, at certain times this may be significantly less than it costs to generate and Germany does not pay a subsidy for the renewable energy which is exported from Denmark¹¹².

Potential Costs to Scottish Industrial and Domestic Consumers

Scottish electricity generators require an appropriate return on their investments. For technologies such as renewables and CCS, this requires a level of subsidy. These are spread across the GB consumer base and are therefore more affordable. If the costs were limited to the far smaller Scottish consumer base, the impact on bills would be far higher and, hence, affect economic competitiveness and fuel poverty.

¹⁰⁸ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 09, 2012

¹⁰⁹ Pinsent Masons, 'Scotland's Place in the Renewable Energy World', 2013

¹¹⁰ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 14, 2012

¹¹¹ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 05, 2012

¹¹² Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-ii, 2012

Energy consultancy AF Mercados suggested that the total cost per consumer of achieving the renewable electricity target in the UK was £58 per year. If Scotland becomes independent and the costs of the Scottish Government's target fall on its consumers, they would pay £194 per year, while rUK consumers would pay £43 per year¹¹³. The Scottish Government's view is that "the costs of low carbon electricity generation...to allow GB to meet international obligations to reduce polluting emissions would continue to be spread equally across the consumer base"¹¹⁴.

Following BETTA, the costs of reducing consumer bills in the north of Scotland through the Hydro Benefit scheme are borne by all GB consumers through their bills. If the GB market did not remain and these levels of support were to continue to north of Scotland consumers, it would need to be paid for directly by the Scottish Government or by the far smaller Scottish consumer base, which would increase bills.

Regulation

Ofgem is the Great Britain regulator for gas and electricity markets. In its paper on 'Economic and Competition Regulation in an Independent Scotland', the Scottish Government has proposed that Ofgem's economic regulatory roles would be brought together with economic regulatory functions in other sectors to form a combined economic regulator (potentially with or without competition regulation functions).

The Scottish Government has said that "joint operation of energy markets is common throughout Europe" and "will make co-operation between regulatory authorities a necessity". As previously stated, the Scottish Government's desire is to maintain the current GB market. The First Minister has said that a separate Scottish energy regulator would "promote energy efficiency, tackle fuel poverty and enhance our ability to maximise our vast energy potential"¹¹⁵. The extent to which Scotland-specific policies are introduced will determine the impact on the functioning of the GB market¹¹⁶ – such as if new market codes and licensing arrangements would need to be developed, who would meet the costs of these changes, and how the potential effects on existing contracts would be resolved¹¹⁷. National Grid's view is that the closer the policy alignment between regulators in different countries involved in a single energy market, the better. The wider the variance in policies, the greater the difference in incentives which are put on different generators, operators and suppliers – although that does not necessarily mean that there cannot continue to be a single market operating. The Scottish Government has said that: "a Scottish regulator would co-operate closely with regulators in the rest of GB on a consistent approach to regulation to provide certainty for investors"¹¹⁸.

The Scottish Government has said that there would be a transition process, possibly starting with water regulation and, by staged commencement, bringing in other regulatory functions.

¹¹³ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 05, 2012

¹¹⁴ Ewing, F., 'Letter to Tim Yeo MP' House of Commons Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Supplementary Written Evidence', 2012

¹¹⁵ Salmond, A. *Speech presented to FT Global Energy Leaders Summit*, 18 September 2012

¹¹⁶ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 14, 2012

¹¹⁷ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 15, 2012

¹¹⁸ Ewing, F., 'Letter to Tim Yeo MP' House of Commons Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Supplementary Written Evidence', 2012

This implies that, post-independence, there would be a need for interim arrangements with Ofgem. There would need to be a considerable build-up of expertise on both electricity and gas. The Scottish Government's view is that a combined regulator would reduce costs and that industry will benefit from dealing with fewer regulatory bodies and lower costs. A large proportion of the finance for energy infrastructure is from outwith Scotland or the UK. A potential risk with the proposal is that dealing with two regulatory bodies in the GB market or, depending on its form, the Scottish regulatory framework, may prove less attractive to investors.

The Financial Services Authority, at present, regulates energy companies' energy trading operations. The Scottish Government has proposed that microprudential regulation in an independent Scotland should be undertaken by a new regulator.

Electricity and Gas Networks and Charging

There are significant programmes of investment in the electricity transmission and distribution networks, for maintenance, reinforcement and the development of the offshore electricity HVDC 'bootstraps' planned down both coasts. These are essential to both the UK and Scottish Government's ambitions for renewable electricity. Investment is regulated by Ofgem through price control review processes. The regulatory period for transmission networks (RIIO-T1) covers the period from April 2013 to 2020/21 and for distribution networks (RIIO-ED1) covers the period from 2015 to 2023. There is also a Low Carbon Networks Fund for the distribution networks, the current arrangements for which will run to 2015. There would be a need for certainty on whether these would continue, at least until the end of their regulatory cycles, in the event of Scottish independence.

Funding for this programme is met by TNUoS charges, the costs of which are recovered through GB consumers' bills. If the GB market did not remain, a key question for the Scottish Government would be how to fund investment in these upgrades.

A critical issue is the capacity, management and regulation of the electricity and gas interfaces across the England-Scotland border¹¹⁹. Consideration would also need to be given to the interface between the offshore and onshore planning regimes.

For gas transmission and distribution networks, an independent Scotland would need to consider how to fund the replacement programme; and, as indigenous gas supplies decline in the longer-term, LNG storage or greater interconnection with Europe; and consider any changes which would be needed to the regulation of existing transmission networks for CO₂ transportation to support CCS investment.

Ofgem would be expected to continue with locational electricity transmission signals in England and Wales. If an alternative approach is taken in Scotland, such as the postage stamp/ socialised approach to reduce transmission costs in the north, this would potentially change decisions on investment and effect costs to consumers. While it may still be possible to operate a single GB market, such policy variance may make it more difficult. Costs might be lower in the north of Scotland, with the greatest potential for renewables, but they might be higher in central/ southern Scotland, with the majority of existing generation. There is a question about how proposed interconnectors from Iceland and Norway, should they land in an Independent Scotland but primarily serve rUK consumers, would be charged¹²⁰.

¹¹⁹ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 10, 2012

¹²⁰ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 03, 2012

Administrative costs associated with the operation of the electricity and gas networks could increase if, following Scottish independence, they were no longer single entities and separate institutions were formed, with economies of scale lost¹²¹.

Division of Renewable Energy and Climate Change Targets

The UK's target, under the EU's Renewable Energy Directive 2009, is to achieve 15% of its energy consumption from renewable sources. All Member States have committed to cutting greenhouse gas emissions by at least 20% of 1990 levels by 2020. The future of the UK's targets would probably form part of the negotiations between the Scottish and rUK Governments and the European Commission should Scotland vote for independence and continue in membership of the EU. If an independent Scotland immediately joined the EU, negotiations on whether and how to divide the UK's existing 2020 renewable energy target between Scotland and rUK would probably take place alongside negotiations between Scotland and rUK on the future of the GB market and rUK support for projects and associated infrastructure in Scotland. Similar considerations would apply to the UK's climate change commitments¹²². Any transition arrangements would have to be clarified. If an independent Scotland did not immediately become an EU Member State and the overall EU target remained the same, there may be a negotiation on how to reallocate the existing target between Member States.

The EU recognises the present day position when setting future targets. Scotland already has over 30% of its electricity production from renewables so, in the event of independence, a new, higher target for Scotland than for the UK as a whole may be expected. However, it is likely that Scotland would be able to meet it. The Scottish Government has set a significantly higher target above what is needed for the current EU target. Scotland's renewable electricity target equates to about 20% of total energy. The addition of its heat target would take this to 30%.

In comparison, the contribution of renewables to UK electricity generation was 9.4% in 2011. There is scepticism that the UK can meet its target at the current trajectory. The rUK might use the division of targets to argue with the European Commission that it should have a revised target with a smaller share of the existing UK target¹²³.

National Grid says that renewable energy in Scotland is a crucial part of a balanced energy mix, but much of its potential is remote from existing networks. Scotland has the largest number of projects in the UK, contributing 62% of the total number of projects, but these only account for 21% of the total generation due to connect. In theory, this means that England and Wales can meet its renewable electricity target of 30% of generation by 2020 and its carbon emission targets without any contribution from Scotland. However, this is subject to financial, legal and planning obstacles and there is no guarantee that the high numbers of renewable projects in any area will be delivered. Scotland's contribution makes it more likely that the UK will meet its statutory environmental targets¹²⁴.

¹²¹ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 01, 2012

¹²² Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 15, 2012

¹²³ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 05, 2012

¹²⁴ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 14, 2012

If the targets are split, the rUK Government may claim projects which the UK has supported in Scotland as achieving the rUK renewable energy target. If this means all the projects commissioned in Scotland before Scottish independence, this may amount to as much as half of Scotland's 100% renewable electricity target.

The minimum target under the Renewable Energy Directive is 10%. If rUK was to argue for this reduction and it was successful in its negotiations with the EU, this would reduce rUK's need for imports of Scottish renewable electricity generation¹²⁵.

The Scottish Government points out that National Grid and Ofgem believe that the best way for the UK to achieve its renewable energy target includes a significant increase in renewable electricity exports from Scotland to the rest of the UK. Its position is that exports to the rUK would continue to grow after Scottish independence because these would enable Scotland and rUK to continue to meet certain shared objectives with regard to electricity, which are a reasonable cost to consumers, security of supply and the encouragement of renewable energy¹²⁶.

It is always possible that, with a number of Member States struggling to achieve them and facing long-term budgetary pressures, EU targets will not be enforced or that the rUK could, unilaterally or multilaterally, ignore the EU's target. While this would probably lead to infringement action, the European Commission would not be able to begin this until shortly before 2020 and the case may take several years. The rUK may take the view that any penalties are likely to be cheaper than the costs of meeting the target. This would lessen the rUK need for Scottish renewable electricity generation¹²⁷.

rUK Alternatives – Generating More Renewable Energy

The UK Government acknowledges the importance of Scotland, but also states that England, Wales and Northern Ireland produce significant renewable energy and are especially strong in technologies like biomass and solar, and that some of the cheapest offshore wind power is off English waters, because they are shallower¹²⁸. For this reason, the majority of the offshore wind capacity currently in the planning pipeline or under active development in the UK lies in English and Welsh waters.

Some have suggested that financing the Severn Barrage project (capable of producing about 5% of English-Welsh electricity demands) might be a more attractive use of consumer subsidies than importing renewables from Scotland or the EU, as it would create growth and jobs¹²⁹. There are big environmental hurdles, but the UK Government is keeping open the option of a Barrage in the longer term.

One of the big changes in recent years is the UK Government's treatment of co-firing biomass. Two and a half years ago it was expecting 5 to 10TWh, now it is expecting 40TWh.

¹²⁵ Toke, D. *et al*, 'Scotland, renewable Energy and the Independence Debate: Will Head or Heart Rule the Roost?', *The Political Quarterly* Vol.84 (1), 2013

¹²⁶ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence', *House of Commons*, HC 1912-i, 2012

¹²⁷ Toke, D. *et al*, 'Scotland, renewable Energy and the Independence Debate: Will Head or Heart Rule the Roost?', *The Political Quarterly* Vol.84 (1), 2013

¹²⁸ Economy, Energy and Tourism Committee, 'Inquiry into the Scottish Government's renewable energy targets, Session 2012-13 Oral Evidence', *Scottish Parliament*, Session 4, 21st Meeting, 2012

¹²⁹ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 05, 2012

Co-fired biomass could be incentivised further to generate another 20 to 30TWh¹³⁰. More support was announced in the Banding Review.

rUK Alternatives – Importing Electricity via Interconnectors

Greater penetration of renewables strengthens the case for interconnection to smooth any variability in supply. The EU is promoting cross-border connections¹³¹.

The UK already has interconnectors with France, Ireland and the Netherlands. There have been discussions between the UK Government and the Norwegian and Icelandic governments about interconnectors to transmit their hydro and geothermal power. Cables between these countries and the UK would be longer than any operational at present. There are two proposals for interconnectors with Norway, NorthConnect (in which SSE was a partner but has recently withdrawn), which would be constructed between Scotland and Norway, and North Sea Network which would be constructed between the north of England and Norway. Either could be constructed by 2020. The Norwegian Government has said that investments would be made “if they are socio-economically profitable” and the proposals may, therefore, be in competition¹³². Iceland’s state electricity company will make an investment decision in 2015-16 and it could be complete around 2020. There is no decision on whether or not it would come ashore in Scotland. They would be very expensive to build and there are many other countries in Europe which hope to source renewable electricity from Norway, which may ultimately lead to price competition¹³³. Discussion has also taken place between the UK and Denmark.

The potential for independence for Scotland could affect discussions between the UK Government and other governments on where interconnectors come ashore given that their primary purpose would be to supply electricity to consumers in rUK.

A sub-group of the British-Irish Council is presently exploring how more electricity might be imported to the UK from Ireland (and exported from the UK to Europe)¹³⁴. A Memorandum of Understanding has been signed between National Grid, REN and Mainstream Power to develop a 5GW grid connection by Ireland and the UK with the aim of supplying 1.2GW of electricity to the UK by 2017¹³⁵. Element Power is developing a scheme for a cable between Ireland and north Wales which it says could provide 10% of the UK Government’s renewable electricity target. It has signed contracts for two connections to the National Grid for 2017 and 2018. This would have a direct grid connection to the GB grid and no connection to the All-Ireland market¹³⁶. The UK and Irish Governments have signed a Memorandum of Understanding which commits them to consider how Irish renewable energy resources, onshore and offshore, might be developed to the mutual benefit of Ireland and the UK. The next stage would be to develop an inter-governmental agreement for signing in 2014.

¹³⁰ Energy and Climate Change Committee, ‘The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence’, *House of Commons*, HC 1912-ii, 2012

¹³¹ Energy and Climate Change Committee, ‘The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012’, *House of Commons*, SCO 14, 2012

¹³² Sunday Herald, ‘Norway could break Scots green energy link’, 17 March 2013

¹³³ Energy and Climate Change Committee, ‘The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence’, *House of Commons*, HC 1912-ii, 2012

¹³⁴ *Economy, Energy and Tourism Committee, ‘Inquiry into the Scottish Government’s renewable energy targets, Session 2012-13 Oral Evidence’, Scottish Parliament, Session 4, 20st Meeting, 2012*

¹³⁵ National Grid, ‘MoU signed for new 5,000MW electricity transmission system for Mainstream Renewable Power’s Ireland – UK export plan’, *News Release*, 13 September 2012

¹³⁶ Element Power, ‘Energy Bill unlocks potential for UK to secure renewable energy from Ireland’, *News Release*, 29 November 2012

Exports could commence from Ireland to the UK by 2020¹³⁷. CfDs could, in principle, be used to support generation that is located outside the UK.

rUK Alternatives – rUK Trading Renewable Generation

Under EU rules on renewable energy, in order to meet its target rUK could buy renewable electricity from any Member State, or even from outside the EU, provided the country of origin is interconnected to a member state. Under the rules, the electricity would not have to be physically delivered to the rUK. The fact that it would be used within the EU and would be 'badged' as renewable energy for the rUK would be sufficient¹³⁸.

This may mean that Scottish renewables would need to compete for rUK subsidy with renewables elsewhere in Europe – biomass from Finland and Sweden, solar from Greece and Spain or hydro from Austria and Romania. The price of the renewable value of this generation elsewhere in Europe could put a ceiling on the price at which Scottish renewable electricity may be sold to the rUK. This would particularly affect more expensive technologies in Scotland and/ or Scottish Government subsidies¹³⁹.

On the other hand, if the EU does not ultimately relax Member States' targets or waive the potential fines in view of the economic crisis and numerous Member States require top-ups to achieve their renewables targets, it might become a sellers' market, with countries competing to buy Scottish renewable electricity if it is competitively priced¹⁴⁰.

Skills

UK Government restrictions on migration have created concerns about efforts to address skills shortages in the energy industry, particularly in highly technical positions.

For the UKCS to remain competitive in a global industry, companies need access to highly skilled personnel, with the Intra-Company Transfer route considered to be absolutely vital. The UK is recognised as a global centre of excellence for oil and gas training and research, with a number of multinational companies basing their centres in the Aberdeen area. These centres support UK jobs and investment, but would be unable to continue to operate in the UK without the ability to bring in people from other countries.

Scottish universities have found it increasingly difficult to recruit overseas students to relevant courses. For example, between 2010-11 and 2011-12, international students coming to Scotland from India and Pakistan fell by around 25%, and students from Nigeria fell 14% compared to the previous year¹⁴¹.

The UK Government has said that its immigration reforms aim to attract highly-skilled migrants who will be valuable to the UK economy. It has so far protected the intra-company transfer route and stated that the UK is still seeking to attract legitimate overseas students.

¹³⁷ DECC, 'Energy trading creates opportunities for Ireland & UK – Davey & Rabbittee', *Press Release*, 24 January 2013

¹³⁸ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change – March 2012', *House of Commons*, SCO 05, 2012

¹³⁹ *Ibid*

¹⁴⁰ *Ibid*

¹⁴¹ Gordon, T., 'Immigration curbs 'utterly out of step with needs of Scotland'', *The Herald*, 31 March 2013

In view of long-term demographic projections, the Scottish Government has a target to increase Scotland's population and is more supportive of immigration. Should Scotland become independent, the Scottish Government might introduce a more flexible system for Scotland. However, in any negotiations to continue the UK Common Travel Area, the rUK's position might be that a broadly common immigration system should be maintained.

Technologies

The Peterhead Project, which involves capturing around 90% of the carbon dioxide from part of the existing gas-fired power station at Peterhead before transporting it and storing it in a depleted gas field beneath the North Sea, is one of two preferred bidders for the UK CCS Competition. A final investment decision will be taken by the UK Government in early 2015 on the construction of up to two projects. Grangemouth has been appointed a reserve project¹⁴². The Scottish Government is strongly supportive of CCS and has been critical of previous UK competitions which have not awarded any funding. The availability of UK capital, R&D and CfDs pricing support for CCS commercialisation and generation in an independent Scotland would also be an issue, and, if they would not be available, whether an independent Scotland could support a project (perhaps, following a successful application, with some EU funding) at a similar level.

There would need to be international ratification of the amendment to the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter to include the trans-boundary shipment of CO₂ for disposal (storage) under the seabed and a bilateral negotiation and agreement with regards to long-term liability for the stored CO₂ following completion of injection and early monitoring¹⁴³.

Scottish universities and businesses are highly successful at securing funding from a range of UK funding bodies for research, development and deployment, including the UK Government, the Energy Technologies Institute, the Technology Strategy Board and UK research councils. The University of Strathclyde is home to the Offshore Renewable Energy Catapult Centre and the Pentland Firth and Orkney Waters Marine Energy Park has been designated as one of the UK's first two marine energy parks. The UK Government has said that this funding would no longer be available following Scottish independence. The Scottish Government is to publish a paper on research funding in an independent Scotland.

Nuclear Generation and Nuclear Decommissioning

The Scottish Government supports life extensions for Scotland's two remaining nuclear power stations. These provide low carbon baseload generation which, while they are in operation, will be key to the Scottish Government's policy of increasing electricity exports and reducing carbon emissions from electricity generation.

There is a question about whether an independent Scotland would have its own repository for nuclear waste or contribute to one storage location for waste from around the island. For industry to have confidence to continue generating in an independent Scotland, it would be preferable that there is clarity and no dispute between it and rUK on waste, so that it would be safely stored.

The costs to the UK Government of nuclear decommissioning are uncertain, but there is a provision for £60.6bn in the national accounts. Five of the UK's 18 power stations are in

¹⁴² 'Carbon capture and storage: government funding and support', <https://www.gov.uk/uk-carbon-capture-and-storage-government-funding-and-support#ccs-commercialisation-competition>

¹⁴³ Energy and Climate Change Committee, 'The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Written Evidence', *House of Commons*, SCO-08

Scotland – 28% of the total, which is far in excess of the Scottish share of UK population or GDP¹⁴⁴ – although one was a research plant. There is a debate about whether an independent Scotland should take on the costs. The Scottish Government has suggested that as the nuclear power stations were set up by the UK Government, it should bear a proportion of the costs based on the lifespan of the plant and how long it produced electricity pre and post-Scottish independence. Others have suggested that the calculation should be based on historic benefits to each country¹⁴⁵. The Nuclear Liabilities Fund, which is a company registered in Scotland, provides funding for the nuclear power stations operated by British Energy, including Hunterston and Torness in Scotland. It received an initial endowment of £228m from the UK Government which appoints three of its five trustees.

Suppliers and Consumers

The six largest electricity and gas suppliers service 99% of the UK market. Rising prices have created concern that this has led to a lack of competition. There may be questions about whether suppliers would continue in their current form or become rUK and Scottish entities. Three of the six companies have low market shares (EDF Energy, E.On and RWE npower) in Scotland and there is a question about whether they would continue to operate in post-independence Scotland if it was necessary to create a distinct Scottish entity.

The Scottish Government has been generally critical of UK regulation of the electricity and gas retail markets. Two examples from the energy sector are identified in its paper on “Economic and Competition Regulation in an independent Scotland”:

- Rising bills and fuel poverty “could be addressed more effectively by a regulatory approach which was tailored more explicitly towards supporting renewables and low carbon technologies and a far greater emphasis on energy efficiency”
- “43% of the households in Scotland without mains gas are in fuel poverty. The existing regulatory model has no mechanism which allows them to access the discounts on energy bills which are available to those on mains gas through ‘dual fuel’ tariffs”¹⁴⁶

This would raise a question about whether the current Scottish Government in an independent Scotland would seek to create more competition and/ or regulate the market more tightly.

There may be changes to financial reporting (e.g. GB segmental statements for Generation and Supply).

The future in an independent Scotland of a range of the UK Government’s consumer policies (such as the Green Deal, smart meters and Energy Company Obligations), as well as its financial support to mitigate rising costs for energy intensive industries, would also need to be resolved.

¹⁴⁴ Select Committee on Economic Affairs, ‘The economic implications for the United Kingdom of Scottish Independence’, *House of Lords*, Evidence Session No.1, Questions 1-55, 2012

¹⁴⁵ Energy and Climate Change Committee, ‘The Impact of Potential Scottish Independence on Energy and Climate Change, Session 2012-13 Oral Evidence’, *House of Commons*, HC 1912-i, 2012

¹⁴⁶ The Scottish Government, ‘Economic and Competition Regulation in an Independent Scotland’, 2013



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