



UNIVERSITY of STRATHCLYDE
**INTERNATIONAL PUBLIC
POLICY INSTITUTE**

CENTRE FOR ENERGY POLICY

Security of supply: Scotland's energy needs in a changing UK electricity market



Karen Turner, Centre for Energy Policy
Peter McGregor and Alf Young, International Public Policy Institute
University of Strathclyde

Making a difference to policy outcomes locally, nationally and globally

POLICY BRIEF

The views expressed herein are those of the author
and not necessarily those of the
International Public Policy Institute (IPPI),
University of Strathclyde.

Security of supply: Scotland's energy needs in a changing UK electricity market

Peter McGregor, Karen Turner and Alf Young

1 Introduction

This paper is an edited version of a submission by the Centre for Energy Policy to the Scottish Parliament's Economy, Energy and Tourism Committee on the security of Scotland's energy supply. It addresses the Committee's four enquiry themes of energy supply, energy demand, the transmission network and market functioning. This paper starts from the premise that the comparatively narrow focus of the Committee's inquiry remit risks overlooking the impact of some wider policy issues facing the Scottish energy market in the years ahead.

2 Background

The Scottish Government has a long standing commitment to fostering renewable energy as a core tool for both environmental protection and economic development strategies. Having passed the Climate Change (Scotland) Act in 2009, setting out tough greenhouse gas emission control targets through to 2050, it published, in 2011, a 2020 Routemap for Renewable Energy in Scotland. By harnessing wind, wave and tidal energy resources and expanding hydro capacity, Scotland would generate "the equivalent of 100% of electricity demand from renewable sources by 2020".

Between 2010 and 2013, the Scottish Government finalised its Electricity Generation Policy Statement setting out the scale of investment needed to meet the target above. It was clear from the start that its ambition was not just simply to meet the equivalent of peak demand within Scotland from renewable sources. As renewable energy in Scotland generated a surplus to Scotland's own requirements, it would be exported, in growing volumes, to meet green energy demand in the rest of the UK and even in mainland Europe. Renewables would become a major growth driver for the Scottish economy.

The sheer scale of this ambition was set out in a series of scenarios produced by consultants Sinclair Knight Mertz (SKM) in a report published alongside the generation policy statement. SKM put the total cost across: (a) new renewable generating capacity (mainly onshore and offshore wind); (b) three new thermal base load generators by 2030 (all fitted with carbon capture and storage (CCS)); and (c) up to five new cross border transmission links to carry all

that exported electricity needed to meet the 2020 target “in the region of £35bn”. As acknowledged, this is a considerable investment challenge in the prevailing economic climate (and one exacerbated by the impacts of the network price system on price incentives for potential investors).

Last year the Scottish Government, through its Scottish Energy Advisory Board, commissioned KPMG to assess Scotland’s security of supply in the GB electricity market. Its 58-page report, published in October, was co-authored by Alistair Buchanan, Chair of its Power and Utilities practice, and, between 2003 and 2013, Chief Executive of Ofgem. Among its key messages, KPMG suggested security of supply up until 2020 “seems largely secure” but “largely dependent on the presence and operation of Scotland’s three largest thermal plants” (Hunterston, Torness and Longannet). Beyond 2020 its analysis showed “a significant deterioration in Scotland’s capacity margin”. Of the prospects for additional renewable capacity, it saw the prospects for offshore wind (a major contributor to earlier SKM scenarios) as being “more mixed”. The report also detected “relatively weak incentives to build new thermal capacity in Scotland or to continue to operate some existing thermal plant in the medium term”.

Scottish Power’s announcement in March 2015 that Longannet is likely to close by March 2016, having failed to win a small grid supply contract, removes one of the dependencies in the KPMG analysis. If the Longannet closure materialises, the Scottish generating system will be largely dependent on its two remaining nuclear stations for base load power. Hunterston already has a life extension to 2023 and it is anticipated that Torness, previously expected to close that same year, will be granted an equivalent life extension to 2030. The Scottish Government has said it will not oppose these life extensions. But its longest standing energy policy commitment is a resolute rejection of any new nuclear generating capacity being built on Scottish soil.

3 Security of supply in a wider policy context

The Centre for Energy Policy (CEP) is concerned that the focus of the Committee’s enquiry round the four, aforementioned themes may inadvertently leave other key questions about evolving energy policy across these islands unexplored.

The core issue is that a narrow focus on security of supply in a purely Scottish context overlooks the fact that the current Scottish government is fully committed to maintaining a single market for electricity and gas across England, Scotland and Wales. As last year’s

independence White Paper – Scotland’s Future (2014) made clear, that arrangement would continue, even were Scotland to become an independent nation state.

The White Paper could not have been clearer: “Under these proposals, the current market trading arrangements for electricity and gas will continue, with the aim of maintaining a competitive market for energy throughout these islands”. “This meets the legitimate expectations of consumers, suppliers and generators of energy across Scotland and the rest of the UK. This Government proposes that a single Transmission Operator will continue to balance supply and demand across Scotland and the rest of the UK.”

There are some wider policy questions about competitiveness and regulation, as well as security of supply, that flow from this policy stance:

1. Even if the Scottish government still believes it can attract the scale of investment identified by SKM to generate enough renewable energy to not simply ensure security of supply but also become a major exporter of green electricity to England and beyond, the question of imports to secure supply in Scotland remains. This is particularly so, given the issue of intermittency of renewables and the possibility that one of our two nuclear plants must undergo a maintenance outage. Might the Scottish Government be prepared to see security of supply here in Scotland guaranteed by welcoming imports of base load power from generators in the rest of these islands, regardless of the generation technology? Such imports are already happening and will grow with time.
2. Following from the above, if a single competitive market for electricity across these islands is the right model, whatever Scotland’s constitutional future, and some of our future electricity imports to maintain security of supply are generated from new nuclear capacity (e.g. the proposed Moorside nuclear plant at Sellafield in Cumbria), does the Scottish government’s current embargo on any future nuclear new build on Scottish soil make any rational sense? Nuclear has, after all, proved itself to be a relatively reliable source of low carbon base load over many decades.
3. The two dominant players in the Scottish energy supply market, Scottish Power and SSE, started life as state-owned utilities, serving defined geographies within Scotland, vertically integrated so they controlled everything from generation, through transmission, to supply. Today, they each have a significant customer base and a range of generating assets north and south of the border. Between them they still own the high voltage transmission grid across Scotland. Both have been major investors in onshore wind in Scotland. However, judged by choices made so far, both seem more interested in offshore wind investment opportunities south of the border. Is the existing competitive structure in Scotland sufficient

to deliver the “largely decarbonised electricity system by 2030” that the Scottish government wishes to see?

4. National Grid owns the high voltage transmission grid south of the border. It is also the designated system operator for England, Wales and Scotland, and the single transmission operator that the Scottish Government, in its White Paper last year, wanted to see continue to balance supply and demand across GB. National Grid is another legacy of privatisation, a commercial company with interests across the Atlantic and shareholders to satisfy. Is it the right body to act as systems operator? Or should that role be played by a not-for-profit public agency, as it is in Australia? One particular area of concern may be in terms of community energy development in grid constrained areas, where decision-making on connectivity etc. is often perceived as lacking transparency (Ofgem is currently conducting a consultation gathering evidence on instances where grid and/or regulation issues have impeded or prevented community energy developments (or Non-Traditional Business Models for energy supply)).

Even when the selected themes are addressed, such as supply and how predictable peak demand can be considered to be, we believe it is vital that these questions are also set in a wider energy context, as follows.

5. Smoothing peak electricity demand over the daily cycle will require much more widespread use of smart metering and smart appliances, programmed to operate when background demand is muted. However, there will be countervailing growing (and varying peak load) demands on electricity supply if and when more space heating and transport migrates from hydrocarbons like gas, petrol and diesel to electric or even hydrogen power. Even prior to this transition, there is also plenty of unfinished business in trying to improve energy efficiency in many areas of life, particularly where this impacts household energy use, which is problematic for a number of reasons, not least the affordability of the required investment in energy saving technologies. A fuller analysis of the likely impact of energy efficiency changes for industry and households, including any “rebound” effects, seems a necessary pre-requisite for a fuller understanding of their potential contribution to energy policy goals, including security of supply.
6. Given the unpredictability of major sources of renewable energy, like wind, we need to redouble our efforts to develop cost-effective and efficient means of storing electricity when the wind blows but demand is low. The current alternative is to pay generators so-called constraint costs to prevent them generating at times when no one wants the power. In its report, SKM estimated that if new plant was constructed on the scale it envisaged to meet the Scottish government’s green ambitions, constraint costs, in Scotland alone, could hit

£650m a year by 2020. That would strike at another issue that would need to be considered in a range of contexts (including energy efficiency and the cost of shifting to electrification of heat and transport): the affordability for hard pressed consumers, and the competitiveness of Scottish industry.

Finally there are some proposals in the Smith Commission's report on further devolution of powers to the Scottish Parliament which impact directly on energy policy in Scotland.

7. The proposals on the energy market and renewables that give a formal consultative role to the Scottish Government and Parliament in designing renewable incentives, and the strategic priorities set out in the energy strategy and policy statement to which the regulator, Ofgem, must have due regard, are an advance. However, they are unlikely to resolve tensions over issues like higher transmission charges facing generators located far from the locus of ultimate demand. A key question may be whether the current transmission pricing formula should be the subject of debate (e.g. whether it should be adjusted to reflect issues of public/social concern such as direct and indirect (supply chain) employment and/or low carbon characteristics of peripheral generation plants).
8. The plan to devolve licensing of onshore oil and gas extraction in Scotland has already made an impact on policy. It has persuaded the Scottish Government to place an open-ended embargo on any fracking activity north of the border, setting it at odds with Ineos, the owner of much of the Grangemouth petrochemical complex, which is already advancing plans to import fracked gas from the US as feedstock and which has assembled exploration rights over a broad swathe of central Scotland. Yet, there was no such standoff over hydrocarbons discovered under the North Sea. Perhaps the public tensions over our continuing widespread dependence on hydrocarbons and their derivatives will only decline when technologies like carbon capture and storage move from prototype testing to commercial reality, and/or in circumstances where the price of carbon more accurately reflects their climate change externalities. Scotland has two ongoing CCS projects. One, led by SSE and Shell UK at Peterhead, is in the final round for competitive funding from the UK Government. This involves a retrofit to a gas-fired power station, competing with an integrated new-build coal-gasification plant, called White Rose, in Yorkshire. The second, which has just received £4.2m jointly from the UK and Scottish governments, is for a prototype coal plant at Longannet, being developed by Seattle-based Summit Power. However, we are likely to be into the 2020s before either has proved itself in terms of either technical or economic viability.

9. The issue of CCS is worthy of careful consideration. In a more general context it is recognised that appropriately supported CCS deployment could provide a substantial medium term alleviation of environmental pressures from burning fossil fuels, and allow time for alternative technologies to develop to commercial deployment (perhaps including large scale storage). However, in a Scottish context, we have particular opportunities for CCS due to a significant share of large emitters being located within 10km of key carbon transportation capacity and the relative safety of Scotland's off-shore storage capacity, which also acts as a key enabler of potential enhanced oil recovery in the North Sea. Moreover, CCS may play a key role in the context of the changing nature and security of the wider Scottish energy industry (including the coal industry generally and new opportunities such as underground coal gasification in particular). Furthermore, Scotland has the potential to build world-leading expertise in developing and deploying CCS technology (e.g. the Scottish Carbon Capture and Storage research group is the largest CCS research network in the UK), thus potentially offering similar opportunities to that of renewable technology development.

Our general conclusion is of the need to broaden the focus of the current consultation in particular, but also of the broader 'energy policy' debate in Scotland and to consider the bigger picture of how economic, climate and energy policy issues and decision-making interact. For example, not only do heat and transport need to be moved up the policy agenda (from their current 'long term concern' status), it is important to note that both fall outside of the EU's ETS coverage and therefore offer opportunities (in the shorter term through improved energy efficiency) for emissions reductions that count towards Scotland's current climate change targets.

About the authors:

Karen Turner is Professor and Director of the Centre for Energy Policy (CEP), International Public Policy Institute (IPPI), University of Strathclyde.

Peter McGregor is Professor of Economics at the University of Strathclyde and Director of the University of Strathclyde's International Public Policy Institute (IPPI).

Alf Young is a Visiting Professor to the International Public Policy Institute (IPPI), University of Strathclyde and a leading commentator on economics and policy issues.

Contact details:

Karen Turner

Director, Centre for Energy Policy
University of Strathclyde

e: karen.turner@strath.ac.uk

t: 0141 548 3198

International Public Policy Institute (IPPI)

McCance Building, Room 4.26
University of Strathclyde
16 Richmond Street
Glasgow G1 1XQ

t: +44 (0) 141 548 3865

e: ippi-info@strath.ac.uk

The International Public Policy Institute

IPPI focuses on global policy challenges in energy, future cities, health, economic development, government and public sector policy, education and social policy. IPPI draws on expertise from across the Humanities and Social Sciences, Strathclyde Business School, Science and Engineering and takes an inter-disciplinary approach to public policy challenges.



the place of useful learning

www.strath.ac.uk/ippi

ippi-info@strath.ac.uk

University of Strathclyde Glasgow G1 1XQ

The University of Strathclyde is a charitable body,
registered in Scotland, with registration number SC015263