

SAFE ENERGY E-JOURNAL No.54

September 2011

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1. Scotland's Higher Activity Waste Policy

The Committee on Radioactive Waste Management (CoRWM) will be reporting on its scrutiny of the Scottish Government's Higher Active Waste (HAW) policy consultation process at its meeting on 14th September in York. (1) The Scottish Government published its finalised Higher Activity Waste Policy on 20th January 2011. (2)

CoRWM makes clear that it disagrees with the Scottish Government's view that geological disposal is not a "*reasonable alternative*" to the proposed policy of storage and near-surface disposal, particularly for those types of HAW that are unsuitable for near-surface disposal.

CoRWM notes that the policy is silent on a final end point for HAW that cannot be disposed of in near surface near site facilities. It says this leaves owners of waste with no guidance on how they should plan for a final solution. Their only current option is to plan for continuous storage. The Committee considers that it will be essential to re-examine the option of geological disposal of Scottish HAW during the ten yearly reviews of the policy. The objective of the re-examination would be to ascertain whether, in the light of further knowledge, geological disposal would be an appropriate option for HAW that cannot, for whatever reason, be disposed of in near-surface facilities. The Committee also notes that there is much work to be done to determine whether, where, how and for which wastes the near surface disposal option might be implemented.

CoRWM makes no comment on the fact that storage remains the priority and primary long-term management option. Nor does it mention that "*The Policy requires that disposal facilities should be monitored and that there should be a capability to retrieve waste packages and waste if necessary.*" (para 2.04.29) The Committee does, however, criticise the Scottish Government for not giving a technical justification for the exclusion of geological disposal - it simply stated that it was its policy prerogative to exclude it.

- (1) See <http://corwm.decc.gov.uk/assets/corwm/post-nov%2007%20doc%20store/plenary%20papers/2011/2818-sg-haw-policy-scrutiny-sept-2011.pdf>
- (2) The Policy document can be found at: <http://www.scotland.gov.uk/Publications/2011/01/20114928/0> Alongside this a "Post Adoption Strategic Environment Assessment" was also published: <http://www.scotland.gov.uk/Publications/2011/01/20115159/0> The Government has also published its response to submissions made to the consultation here: <http://www.scotland.gov.uk/Publications/2011/01/20115440/0>

2. NDA Storage Guidance

Meanwhile the Nuclear Decommissioning Authority (NDA) has issued national (UK) guidance about the storage of higher activity wastes (HAW) at its sites, including Dounreay. The guidance aims to standardise the arrangements for storage of this type of waste during the next 100 years. (1) The NDA says robust storage arrangements should provide high confidence that packages will remain in a safe condition, be disposable at the end of the storage period and will be unaffected by any variance in the availability of disposal routes. In line with UK and Scottish Policies and CoRWM recommendations, the arrangements will need to remain effective for a period of at least 100 years.

- (1) Dounreay Site Restoration Ltd 30th Aug 2011 <http://www.dounreay.com/news/2011-08-30/nda-issues-guidance-on-storage-of-higher-activity-waste>
- (2) NDA 26th Aug 2011 <http://www.nda.gov.uk/stakeholders/newsletter/industry-guidance.cfm>

3. Nuclear Waste Directive

The European Council has adopted a new Radioactive Waste and Spent Fuel Management Directive that is intended to regulate the safe management of the highly dangerous by-products of nuclear energy. According to Energy Commissioner Günther Oettinger:

“After years of inaction, the EU for the very first time commits itself to a final disposal of nuclear waste. With this directive, the EU becomes the most advanced region for the safe management of radioactive waste and spent fuel.”

The Directive imposes strict obligations on member states – they are required to draw up national programmes for the construction of modern disposal facilities, including a timetable, costs assessment and description of activities to be used in waste management. These have to be presented to the Commission by 2015 and subsequently updated regularly.

It will be interesting to see how this impacts on Scottish Government policy.

New Europe 24th August 2011

<http://www.neurope.eu/articles/Radioactive-Waste-Directive-Will-nuclear-power-safety-be-improved/108030.php>

4. Dounreay Particles

351 radioactive particles were recovered from the seabed off Dounreay over a nine week period to the beginning of July. 38 of them were said to be large enough to pose a significant health risk. The particles were retrieved using a remotely operated vehicle working at depths of up to 30 metres. Over an area equivalent in size to 36 football pitches, the vehicle picked up 351 particles. The latest haul, recovered in an operation which began in May and ended last week, takes the total number of radioactive particles found on the seabed and beaches near the Caithness nuclear site to more than 2,300. Data from the operation is now being compiled and will be shared with the Particles Recovery Advisory Group, a team of independent experts who advise the Scottish Environment Protection Agency and Dounreay Site Restoration Ltd (DSRL), the company overseeing the decommissioning of the nuclear plant.

Dounreay Site Restoration Ltd 6th July 2011

<http://www.dounreay.com/news/2011-07-06/underwater-search-yields-another-351-particles>

Scotsman 7th July 2011

<http://thescotsman.scotsman.com/news/38-39highrisk39-particles-are-found.6797146.jp>

5. Plutonium waste could be sent by rail from Dounreay to Sellafield

The NDA published a consultation document on the Dounreay Fast Reactor (DFR) “breeder material” in July. The document said there is a clear and compelling strategic case for the DFR “breeder material” to be reprocessed at the Magnox reprocessing plant at Sellafield rather than being immobilized at Dounreay. (1)

This so-called “breeder material” comes from the experimental DFR reactor which operated from 1959 to 1977. The “material” was an outer ring of uranium metal (rather than the inner core of plutonium fuel) which captured neutrons from the inner core and produced plutonium. The NDA says *“The breeder material is radioactive, but much less so than fuel since it does not contain large amounts of fission products, and it has also been cooled since 1977.”* The NDA says it will cost

around £30m to prepare and transport the waste and then about another £30m to reprocess it at Sellafield. (2) Treating and storing it at Dounreay would cost an estimated £65m.

Friends of the Earth Scotland condemned the proposed movements, claiming they pose unacceptable risks for accidents, mistakes and sabotage - the possibility of accidents or the material getting into the hands of terrorists meant the shipments presented too high a risk. (3) If approved, the first of 46 shipments could start in January 2012 and run over four years.

In the late 1960s, 30 tonnes of breeder material was sent from Dounreay to Sellafield, but a further 44 tonnes remains at the Caithness site. It is considered to be neither fuel nor waste. A final business case for its disposal will be presented in the autumn and a decision by the NDA is expected two months later. (4)

Corrina Thomson writing on the John O'Groat Journal website complained about NDA doublespeak. She says the NDA's report is a damning indictment of how the NDA works and drives an axe through some fairly reasonable attempts in recent times to treat the public as if they are intelligent enough to make their own decisions about what should happen to our nuclear "legacy". Before the reader even reaches the options on what to do with the scrap sitting in the Dounreay sphere, the report begins by telling people how they should refer to the stuff in question. The breeder material is not classified as a fuel, as it does not take part in the nuclear "core" reaction and is not converted into fission products, but neither is it waste. This is why, to avoid confusion, it is referred to as "material" it says. (5)

She reminds us that some of the material is so stuck in the reactor that special plans have been drawn up to cut it out, and there is no appraisal of the litany of problems that have beset reprocessing at Sellafield.

It is a struggle to find any mention of the fact that the NDA's document is a consultation. It says "*In preparing the final business case, the SLCs and NDA will need to engage with regulators, stakeholders and local communities to gain their view of the proposed strategy for management of this material.*" The NDA does say in its press release that it wants comments on its paper by end of August 2011. (6)

The NFLA consultation response expressed concern about the possibility of transport accidents and terrorist attacks. As the "material" will contain weapons grade plutonium there is a risk of theft by terrorists en route to make it into a dirty bomb or even a crude nuclear device. This probably means the material will have to be escorted by armed guards. The submission argued the material should be treated as waste and "immobilised" at Dounreay.

In addition the submission highlighted the failure of the plan to meet environmental principles by failing to ensure that radioactive waste is managed as close as possible to the site where it was produced. Reprocessing the material at Sellafield would also lead to increased radioactive discharges into the environment. (7)

The NDA admitted that discharges from Sellafield could increase as a result of reprocessing this material but said this would amount to less than one per cent per year. (8) An increase by any amount, no matter how small cannot be described as "progressive and substantial reductions" which the UK agreed to when it signed OSPAR Treaty.

The Highland Council urged the NDA to consult widely with communities before deciding to start the transports. The Council's Director of Planning and Development, Stuart Black, says he is disappointed that the NDA is not consulting with the communities that are likely to be affected on the rail route from Caithness to Sellafield, including several of the main population centres in the Highlands. In the Council's response, Mr Black says: "We feel this proposal to transport spent fuel rods from Dounreay to Cumbria will be controversial and therefore there is a need to explain what this will entail at the earliest opportunity." The implication of transferring the spent fuel, he said, was that

there will be less need for investment in the Dounreay site than would otherwise be the case if the fuel remained there. (9) Bizarrely, the NDA said that while it had not talked to every local authority on the rail route, it had consulted the public. (1)

- (1) Exotic Fuels: Credible and Preferred Options. NDA, July 2011
<http://www.nda.gov.uk/documents/upload/Exotic-Fuels-Dounreay-Fast-Reactor-DFR-Breeder-Credible-and-Preferred-Options-July-2011.pdf>
- (2) BBC 8th July 2011 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-14084296>
- (3) Press and Journal 12th July 2011 <http://www.pressandjournal.co.uk/Article.aspx/2349323>
- (4) Scotsman 12th July 2011 <http://news.scotsman.com/news/Anger-at-move-to-send.6799917.jp>
- (5) John O'Groat Journal 5th August 2011 <http://www.johnogroat-journal.co.uk/Features/The-Free-Press/Not-fuel-and-not-waste-so-what-is-it-03082011.htm>
- (6) NDA Press Release 8th July 2011 <http://www.nda.gov.uk/news/dfr-exotic-fuel-options.cfm>
- (7) Guardian 26th August 2011 <http://www.robedwards.com/2011/08/nuclear-train-route-to-sellafield-runs-into-opposition-from-local-councils.html>
- (8) NW Evening Mail 31st August 2011 <http://www.nwemail.co.uk/home/scots-worried-by-nuclear-fuel-route-1.873532?referrerPath=home>
- (9) Highland Council Press Release 31st August 2011
<http://www.highland.gov.uk/yourcouncil/news/newsreleases/2011/August/2011-08-31-03.htm>
- (10) Herald 1st September 2011 <http://www.heraldscotland.com/news/transport-environment/dounreay-urged-to-consult-on-nuclear-waste-plan-1.1121046?82299>

6. More waste transports?

Shetland Islands Council is to write to national and foreign governments in an attempt to stop nuclear shipments through its territorial waters which are planned to take place soon. Councillors on the environment and transport committee declared themselves wholly opposed to the proposed shipments, which will involve 16 (and eventually 32) redundant radioactive steam generators being taken from Canada to Sweden for decontamination and recycling. The route would take the ships through the Fair Isle Channel. The steam generators would come from Canada's first private nuclear operator Bruce Power and go to the firm of Studsvik in Nyköping, Sweden. The firm would decontaminate around 90 per cent of the materials, sell the scrap metal on the open market and return the remaining waste to Canada.

Shetland Times 31st Aug 2011

<http://www.shetlandtimes.co.uk/2011/08/31/council-objects-to-nuclear-shipments-through-fair-isle-channel>

7. Scottish anti-nuclear policy

Colin McInnes is Professor of Engineering Science at the University of Strathclyde stirred up controversy on the Scottish Government's anti-nuclear policy once again with an article in *The Herald*. (1) Unusually this time he provoked a response from the trade body – Scottish Renewables – with his claim that renewables are an increasingly risky bet. Scottish Renewables said Scotland has fantastic renewable energy resources, and we should play to our strengths and look to capitalise on our natural resources – 25% of Europe's wind and tidal resource, and 10% of its wave energy.

The trade body continues – There is a £2bn annual subsidy from UK taxpayers to fund decommissioning of nuclear power stations, twice the levels of support to renewables. The Department for Energy and Climate Change and the independent regulator Ofgem have published research concluding that investment in renewables will protect consumers from hikes in bills due to increases in gas prices in coming years. Professor McInnes points to the proposed nuclear plant in Cumbria with a colossal 3600MW capacity. Scotland already has more than 4300MW of renewable electricity in operation, and plans for almost 10,000MW of offshore wind and 1600MW of wave and tidal projects by 2020. These new projects will attract thousands of job opportunities and inward investment and tackle climate change. The renewables industry is actively exploring options for

storage capacity, cost reduction and financing the necessary grid connections to transport power to where it is consumed. (2)

- (1) Herald 29th August 2011 <http://www.heraldscotland.com/comment/guest-commentary/anti-nuclear-policy-won-t-help-us-meet-climate-goals-1.1120292?68935>
- (2) Herald 31st August 2011 <http://www.heraldscotland.com/comment/herald-letters/we-should-capitalise-on-gift-of-abundance-of-natural-resources-1.1120754>

8. Defence Facilities

The risk of accidents and radioactive leaks from Britain's ageing nuclear bombs and submarines is getting "progressively worse" because of deepening spending cutbacks, according to an internal Ministry of Defence report. The report also criticises the MoD for failing to allocate funding for the decommissioning and disposal of 17 defunct nuclear submarines now laid up at Devonport in Plymouth and Rosyth in Fife.

Guardian 25th Aug 2011

<http://www.guardian.co.uk/world/2011/aug/25/nuclear-safety-military-mod-study>

Read the Defence Nuclear Environment Safety Board Report

Guardian 25th Aug 2011

<http://www.guardian.co.uk/world/interactive/2011/aug/25/nuclear-weapons-military>

9. Renewable Notes

A seven turbine wind farm near Huntly in Aberdeenshire has been bought by Ikea. The wind farm will generate electricity equivalent to about 30% of Ikea's consumption. Ikea is also installing solar panels on the roofs of some of its stores.

Sunday Times 14th Aug 2011

http://www.thesundaytimes.co.uk/sto/business/energy_and_environment/article700241.ece

Edinburgh could be powered by a huge offshore wind farm under new proposals from Mainstream Renewable Power. The wind farm would consist of as many as 130 turbines and could be installed 30km north of Dunbar. The wind farm would connect to the National Grid through East Lothian.

Utility Exchange 20th Aug 2011

<http://www.utility-exchange.co.uk/giant-wind-farm-could-power-edinburgh-14766/>

GLASGOW energy firm EML Group is seeking to capitalise on the boom in community wind projects across Scotland with a part-ownership scheme that offers towns and villages a slice of the profits from turbines in their area. The company is offering community groups access to 100 per cent finance to take a share in small wind turbine arrays it plans to build. It says this allows communities to take part in energy projects without any risk or capital outlay.

Scotsman 21st Aug 2011

<http://business.scotsman.com/energyutilities/Villagers-invited-to-share-in.6822147.jp>

A £20 million plan to transform Oban into the west coast service capital for the renewable energy sector is to be lodged with the Scottish Government this week. If the ambitious move is approved, it is predicted that 500 jobs would be created - a significant number for a town with a population of just 8,500 people.

Scotsman 15th Aug 2011

<http://thescotsman.scotsman.com/news/Oban-seeking-20m-loan-to.6818735.jp>

The RSPB could drop its objection to the Lewis wind farm proposals if concerns over its effect on golden eagles are met. The project, which needs the consent of the Scottish Government, is being developed with community body the Stornoway Trust and could produce up to 151MW.

Scotsman 17th Aug 2011

<http://www.scotsman.com/environment/Bird-charity-39could-drop-objection.6819999.jp>

ENERGY giant Scottish Power is to create 1,500 jobs in Scotland as it spends 3 billion upgrading electricity networks to boost use of renewable energy. It plans to connect up to 11 gigawatts of renewable energy projects in the next decade, which it says would be capable of generating four times as much electricity as Longannet Power Station. Scottish Power said it would require a substantial number of new apprentices to carry out the work and hopes to train up young people into highly skilled jobs. Research has suggested four out of five energy industry employees are due to retire over the next 15 years and Scottish Power said it wants a new generation of workers.

Scotsman 18th Aug 2011

<http://thescoatsman.scotsman.com/environment/New-generation-for-Scottish-energy.6820624.jp>

Efforts to generate cost-effective power from the sea have taken a step forward with the launch of a new wave-energy device. The new Oyster 800 can, at a third of the cost, generate 250% of the power of the first full-scale Oyster device which was installed and grid-connected at the European Marine Energy Centre (EMEC) in Orkney in late 2009. First Minister Alex Salmond unveiled Aquamarine Power's next-generation 800kW hydro-electric device at Burntisland Fabrications yard in Methil, Fife.

PA 14th July 2011

http://www.pressassociation.com/component/pafeeds/2011/07/13/salmond_visits_wave_energy_facility?camefrom=scotland-news-wire

Annex

Realising the Scottish Renewables Revolution in Energy Policy

Introduction

In July 2010, Nuclear Free Local Authorities published briefing No.76 entitled "Scotland's electricity needs – can they be met from renewables without recourse to nuclear?"¹ This concluded that with sufficient political will from the Scottish Government, and supported by local authorities, Scotland could produce 100% of its electricity requirements from renewable sources. In fact from plans at the time for offshore and onshore wind, wave and tidal power it appeared likely that Scotland would be able to generate 179% of its electricity requirements soon after 2020.

Since then a lot has happened – for instance the Scottish Government has decided to increase its target for renewable electricity in 2020 from 50% - first to 80% in September 2010² and then to 100% in May 2011.³ This briefing looks at developments since July 2010, but should be read in conjunction with the earlier briefing.⁴

In December 2010, Friends of the Earth Scotland (FoES), the Royal Society for the Protection of Birds (RSPB) Scotland and WWF Scotland jointly published research by leading energy consultants, Garrad Hassan, called "*The Power of Scotland Secured*". This showed that Scotland could phase out all conventional fossil fuel and nuclear power stations by 2030, produce 185% of Scotland's electricity needs, maintain a secure electricity supply, and generate revenue from renewable exports.⁵ The report also shows that, contrary to popular myth, the variability of renewable power need not pose a threat to the reliability of supply in Scotland. The transmission infrastructure required to keep the lights on at times of low renewable output will be easily justified by the value of exports made

possible at times of high output. Costs to consumers are unlikely to exceed those in other future scenarios.

Despite the Garrad Hassan report, the feasibility of the 100% renewables target was a major election issue in the May 2011 Scottish Parliamentary elections. The target was attacked by various people including business leaders mostly on the grounds of intermittency.⁶ But this ‘campaign’ was rather undermined when the 100% target was endorsed by seven leading industry figures.⁷ Ignacio Galan, chairman and chief executive of Scottish Power’s parent company, Iberdrola, described the renewables goal as "entirely credible".⁸ Rick Eggleston, the managing director of wind turbine manufacturer RE power, also threw his weight behind the 100% target.⁹ Niall Stuart Chief Executive of the trade body, Scottish Renewables said, nobody is arguing that Scotland would not continue to have other forms of generation alongside a significantly expanded renewables sector. Greater renewables capacity, as part of a balanced mix of technologies, would allow Scotland to meet more of its own needs from sustainable, low-carbon generation and grow its electricity exports to other parts of the UK and Europe. It would also create wealth and employment here in Scotland. The target is ambitious, but not beyond reach. It will require concerted action to build the right market frameworks and grid infrastructure, and to maintain the right balance in the planning system, but the industry and technology have developed rapidly over the last few years and only a proportion of existing plans and commitments for wind, wave, tidal, biomass and hydro are required to hit the target.¹⁰

Scottish Route Map

An action plan to drive forward Scotland's renewables revolution, and meet targets, was launched by Energy Minister Fergus Ewing in June 2011. The Renewables Route Map outlines the steps needed to meet ambitious targets, including supplying 100% of electricity demand equivalent from renewables by 2020.¹¹ It also sets out plans for achieving renewables targets for heat and transport and sets a new target to meet 30% of total energy (as opposed to just electricity) demand from renewables by 2020, up from the previous target of 20%. This puts Scotland on a par with leading European countries – the target is double the UK target. The roadmap also sets a new target to deliver 500MW of community and locally owned renewable energy by 2020, and outlines a commitment to develop strategies for microgeneration and agri-renewables.¹²

Route Map in Numbers

Installed Capacity required	~ 16 GW (Gigawatts)
Current renewable installed capacity	4.2 GW
Under construction	1.2 GW
Consented	2.1 GW
In planning	4.1 GW
In Scoping	15.4 GW
Total	27 GW
For comparison Torness is rated at	1.2 GW

The Route Map argues the electricity target should not be considered in isolation from other energy and climate change targets all of which create a degree of interdependency. In particular it highlights the interrelationship between electricity and heat targets and the need to ensure that the limited resource of woody biomass is deployed in the most efficient manner, namely as heat or CHP which demonstrate 90% and 50-70% efficiencies respectively, rather than as electricity-only generation which is 30% efficient. To achieve 100MW installed capacity of biomass electricity requires a million green tonnes – equivalent to a sixth of the Scottish timber harvest, whereas, the same volume of woody biomass, could fuel 250 MW to 600 MW of heat capacity.

A growth in the use of heat pumps (to replace oil-fired central heating for example) may increase demand for electricity. Similarly if Scotland achieves 10% market penetration of electric vehicles by

2020 as suggested by WWF Scotland in their report "Watt Car", May 2010, an additional 1TWh (1,000 GWh) of additional electricity production will be required. As well as having a 2020 target of 10% of transport fuels from renewables, the Scottish Government is committed to achieving complete decarbonisation of road transport by 2050, with significant progress by 2030 through wholesale adoption of low and ultra low carbon vehicles. A full exposition of Scottish Government policy to promote low carbon transport is being developed and will be published later in 2011.

Other Route Map Highlights

- The Scottish Government is determined that the proposed High Voltage Direct Current (HVDC) links to the Western and Northern Isles must go ahead – and within a timescale that will allow these areas to contribute their enormous potential resources towards renewable energy targets.
- The Scottish Government strongly supports the concept of an integrated European grid, incorporating offshore renewable generation. Scotland has remarkable potential, with an estimated offshore resource of 206 GW. This is of European significance, and its exploitation has been recognised as crucial to the ability of Scotland, the UK and the EU to meet their 2020 and 2050 carbon reduction targets.

Sectoral Route Maps

Sector	Route Map	Current	Planned
Offshore Wind	Offshore Wind Industry Group, Sept 2010	185MW	10 GW
Onshore Wind		3.4 GW installed or under construct	2 GW consented 3.5 GW awaiting decision 3.9 GW scoping
Wave & Tidal	Marine Scotland will be taking forward development of a Sectoral Marine Plan for Marine Renewables in Scotland's Renewable Energy Zone during 2011.	3.25MW + 5.9 MW over next 12 months	1.6GW
Renewable Heat	Renewable Heat Action Plan for Scotland , Scottish Government November 2009. Renewable Heat in Scotland 2010 (Progress Report by Energy Saving Trust) March 2011 Will publish shortly results of a study by AEA Technology into the potential to recover "waste" heat from fossil fuel power stations in Scotland. Scottish Government committed to funding heat mapping for local authorities.	2.8% 1696 GWh	11% by 2020 1504 under construction or planned
Bioenergy & EfW	Includes Anaerobic Digestion – plans to start food waste collections and encourage farm waste AD take-up		
Hydro	Scotland's undeveloped hydro potential now estimated at 1.2GW in a new report compared with previous estimate of 657MW		An extra 1.2GW
Micro-generation	Micro-generation Strategy for Scotland planned by end 2011	1322 installs = 7.5MW electricity 2500 installs	Target could be 15% of electricity by 2020

		for heat = 53MW	
Energy Storage	AEA's Energy Storage and Management Study for the Scottish Government, October 2010. http://www.scotland.gov.uk/Publications/2010/10/28091356/0		
Geothermal	Planning Guidance now includes a section on Geothermal Energy		
Community Renewables	A Community and Landowner Renewable Energy Loan Fund Feasibility Study. http://www.scotland.gov.uk/Publications/2010/10/01105500/9	CARES helped 105 schemes = 53MW	500 MW target for 2020
Energy Efficiency	Conserve and Save: The Energy Efficiency Action Plan for Scotland, October 2010, http://www.scotland.gov.uk/Resource/Doc/326979/0105437.pdf		Reduce final energy consumption by 12% by 2020

Route Map - Some Disappointments

The Route Map makes clear the Scottish Government is aiming for an output *equivalent* to 100% of Scotland's demand for electricity to be met from renewable sources. This does not mean Scotland will be 100% dependent on renewables: renewable energy will be part of a wider electricity mix. This means, for example, that despite saying in May that Scotland is ideally placed to follow a similar route to Germany¹³ where eight nuclear reactors which were opened between 1975 and 1984 were closed following the Fukushima disaster, Energy Minister Fergus Ewing told the Scottish Parliament in June there was a "*rational case*" for extending the life of Scotland's two nuclear plants, and that the government was "*perfectly open*" to the continued use of Hunterston and Torness to ensure security of supply.¹⁴ Hunterston B, was opened in 1976, so is older than most of the reactors closed in Germany.

Whilst the Route Map says Scottish Government policy is to phase out nuclear power as existing stations reach the end of their useful lives, the policy of supporting life extensions makes this effectively meaningless.¹⁵ EDF Energy is already preparing its case for a second life extension for Hunterston B from 2016 to 2021.¹⁶ If Torness were to achieve similar life extensions it could still be open in 2033.

WWF Scotland expressed disappointment about the plans for heating and transport.¹⁷ It said Scotland could secure at least 50% of total energy needs from renewables by 2030 by implementing an ambitious energy efficiency programme. Scotland looks set to beat the current target of generating 11% of heat from renewables, so that target should be reset to at least 20% by 2020 to help drive this sector forward. WWF also want to see a clear commitment to secure at least 300,000 electric vehicles by 2020, including the publication of the long-awaited action plan to ensure coordinated delivery.

The Association for the Conservation of Energy pointed out that the Scottish Government's plans allow for a 7% increase in electricity demand by 2020 (whilst aiming for a 12% decrease in energy demand by 2020) compared with Germany's plans to reduce electricity demand by 25% by 2050. Germany has compared the costs and benefits of new renewable generation with energy saving measures, and concluded that the latter make far better economic, social and environmental sense.¹⁸ They are therefore investing more than €1.3 billion per year into energy-saving measures, whereas the Scottish Government has slashed energy saving investment by a third in its 2011-12 budget.¹⁹

Power of Scotland Secured

The Garrad Hassan report - "*The Power of Scotland Secured*" - sets out how Scotland could guarantee security of supply, while decarbonising half its total energy (i.e. not just electricity but also heat and transport) needs by 2030. Scotland could generate 185% of its electricity from renewables by 2030.²⁰

Scottish Electricity in numbers

Scottish Electricity Demand in 2030 (but energy efficiency improvements could be much better)	35,1800 – 45,900 Gigawatt hours (GWh = 1 million kilowatt hours)
Replace some cars and gas heating + 20 to 25%	44,000 – 57,000 GWh
Renewable supply 2030 (low & high growth)	43,000 – 67,000 GWh
Community and household renewables not included.	7,000 GWh

Clearly the quantity of electricity supplied over a year is not a problem, but one of the main arguments against the 100% renewables target, and for retaining nuclear and fossil fuelled generating capacity on top of 100% renewables, hinges around security of supply i.e. not how much electricity you can produce over the course of a year, but whether you have enough electricity at any given moment to meet demand. This leads some people to argue that we need “base-load” fossil fuel or nuclear stations to back up renewable sources when the wind doesn’t blow or the sun doesn’t shine.

But there are other ways of making sure we have a secure electricity supply. Smart meters will be installed in homes and businesses across the UK by 2020. These can work in conjunction with smart appliances, such as freezers, which can turn themselves down or off when electricity demand is high and come on again later. If our buildings and hot-water systems are well insulated they would also be able to vary their power use according to the availability of electricity. The same is true for electric cars.

Another way to manage variability is to store energy. This can be done using “pumped storage” hydro schemes. We already have 740MW of pumped storage capacity in Scotland and there are plans for another 600MW. (Peak demand in Scotland is 6,000MW.) The batteries of electric vehicles could also be used. Combined Heat and Power plants can also help by being built along with heat stores. The successful combination of CHP and renewables is attracting increasing attention across Europe.²¹

Finally improving grid connections between Scotland and the rest of the UK or even mainland Europe will help to reduce variation in demand and supply – if the wind is not blowing in Scotland we can be fairly sure there will be plenty of power somewhere else.

The overall costs of the system outlined in Power of Scotland Secured are likely to be similar to the costs of maintaining a secure supply with a more “business as usual” approach. In fact the price of fossil fuels is likely to rise while the costs of renewables are likely to fall. And renewables and efficiency are the best options when it comes to creating jobs.²²

Beth Stratford, energy campaigner for Friends of the Earth Scotland, says: *“The important thing is to put this in perspective. The possibility of wind output varying by 7-8 per cent from year to year is rather less worrying than the possibility of an enormous power station like Sizewell B having to shut down in an emergency and not reopen for six months, as it did last year. In terms of resilience and reliability, a decentralised energy system based on a broad variety of renewables wins hands down over a centralised system which relies on a handful of enormous power stations, which could fail with no warning whatsoever.”*²³

The differences between the Garrad Hassan plan and The Scottish Route Map.

The Garrad Hassan scenarios show the feasibility of phasing out of all conventional thermal generation capacity before 2030 (fossil fuel and nuclear). Although the report recommends a deadline of 100% renewable electricity generation by 2030 (not just 100% of Scottish consumption) it does allow for the possibility of using Carbon Capture and Storage (CCS) on existing fossil fuelled power stations – but argues against building new ones to trial CCS.

The Scottish Government's plan, on the other hand only looks as far as 2020, but it allows for the possibility of new fossil fuel capacity being built provided it includes some Carbon Capture and Storage (but potentially threatening large increases in carbon emissions), and also allows for the possibility of nuclear stations still being open beyond 2030.

Fuel Poverty – a major problem across Scotland

The Scottish Government is required by the Housing (Scotland) Act 2001 to end fuel poverty, as far as is practicable, by 2016. The most recent figures from the Scottish House Condition Survey show that 677,000 households were living in fuel poverty in 2009, representing 29% of the total.²⁴ According to some estimates this figure has now risen to 40% of Scottish households.²⁵

At the same time, Ofgem has estimated that renewing infrastructure and meeting carbon targets is likely to require an investment of up to £200 billion which will mean significant increases in domestic energy bills of between 14% and 25% by 2020.²⁶ Clearly fuel poverty needs to be central to climate and energy policy. Without an integrated strategy for both there is a danger that climate policy will end up worsening the situation with regard to fuel poverty. There are concerns about the achievability of the 2016 target with numbers of those suffering still growing, so policies which focus on energy efficiency for the fuel poor, including insulation and appliances are necessary and urgent.²⁷

It is areas such as energy efficiency, microgeneration and district heating which will have the most direct impact on fuel poverty and yet these are the areas where the Scottish Government's plans are weakest.

A WWF Scotland report shows how Scotland's existing homes can be transformed into low carbon homes and emissions from the domestic sector cut by 80%.²⁸ A very broad range of physical measures needs to be employed in any retrofit strategy in order to make the required substantial improvements in the energy performance of existing housing. This will include much wider use of solid wall, external insulation for example. Physical measures will need to be combined with consumer behaviour change, improved standards of domestic appliances, and there will need to be a significant introduction of low and zero carbon technologies including microgeneration.

WWF Scotland also wants the Scottish Government to establish a clear road map to make sure all homes sold or rented meet the band 'E' rating on the Energy Performance Certificate scale (A-G), matched with the necessary financial packages. It says for every £1 spent on keeping our houses warm, the NHS can save 42 pence on health costs. This is a win-win for the environment and the public purse.²⁹

Microgeneration

The Route Map says the Scottish Government is committed to developing new strategies for microgeneration and for agri-renewables, to reflect the growing significance of small scale generation and opportunities for local and rural ownership of energy. Power of Scotland Secured says that, based on estimates by the Energy Saving Trust, microgeneration could supply 7,000 GWh of Scotland's electricity by 2030 – equivalent to around 15% of demand. The Government has been criticised in the past for dragging its feet on microgeneration.³⁰

Given the rises in fuel bills expected this winter the Government needs to start implementing some of its strategies on microgeneration. It could, for example, support Dundee City Council's plan to solarise council buildings, including potentially thousands of council homes.³¹

Birmingham City Council has developed a financial model so that it can install solar panels on up to 10,000 council-owned homes – jointly funded by the Council, energy suppliers and commercial banks. This follows two successful pilot schemes conducted in the City. Under the scheme consumers

will pay a levy on their energy bills to repay the loans but should still be paying lower bills after the retrofit. A second phase will involve using the proceeds from the first 10,000 retrofits for a refinancing of the scheme to deliver funding of £2bn, enough to refurbish 200,000 homes.³² On 30th June 2011 the Energy Minister Fergus Ewing MSP was asked if he would look at the Birmingham City Council model. Whilst he failed to commit to doing so, his reply did say there was a consonance of objectives in the Parliament.³³

Combined Heat and Power (CHP) and District Heating

Briefing No.76 highlighted three district heating schemes run by Aberdeen Heat and Power Co Ltd – an independent, not-for-profit company established to develop and manage the CHP schemes. There are also schemes in Clydebank and Edinburgh University. Plans have since been unveiled for a biomass-powered scheme which will heat hundreds of homes in Cardenden owned by Ore Valley Housing Association and Fife Council.³⁴

The Energy Efficiency Plan committed the Scottish Government to appointing a dedicated district heating officer. The Renewable Route Map says the Scottish Government also plans to roll out heat mapping across local authorities and plans to build on the current study on recovery of heat from fossil fuel power stations, and set up an expert commission into the development of district heating to ensure a major move to district heating in Scotland. Until recommendations and further financial support is established, the recently launched District Heating Loan scheme will be an important resource for taking this forward. The Government also says it will ensure the best use of biomass – using it for heat only or for CHP, not using it for electricity only generation.

Conclusions and Recommendations.

There is much to be welcomed in the Scottish Government's Renewables Route Map, but it is disappointingly vague when it comes to energy efficiency, micro-generation and district heating. Cuts in the energy efficiency budget, delays in getting small-scale renewable energy installed particularly on social housing, and lack of progress on district heating schemes where feasibility studies have already shown them to be viable will be frustrating for many local authorities.

The Scottish Government should:-

1. Drop its support for nuclear reactor life extensions.
2. Set a target to produce 100% of electricity generated in Scotland from renewables by 2030
3. Increase the target for renewable heat by 2020 from 11% to 20%
4. Aim to produce 50% of Scotland's energy from renewable sources by 2030
5. Reverse the cuts made to energy efficiency budgets and start thinking big with regard to retrofitting houses across the country in co-operation with local authorities.
6. Investigate how Germany can plan for a 25% decrease in electricity demand by 2050 whereas the Scottish Government is expecting a 7% increase by 2020.
7. It should investigate the Birmingham City Council financial model as a matter of urgency and start working with local authorities so that we see solar panels and other small-scale renewable appearing on social housing as a matter of course.
8. It needs to increase the £2.5 million district heating loan fund to at least £25m. The two schemes in Granton and Muirhouse (where there is no gas supply) investigated by the City of Edinburgh Council and found to be feasible would cost £10m each.

¹ Nuclear Free Local Authorities briefing No.76 Scotland's electricity needs – can they be met from renewables without recourse to nuclear, July 2010

[http://www.nuclearpolicy.info/docs/briefings/A191_\(NB76\)_Scotland_and_renewables.pdf](http://www.nuclearpolicy.info/docs/briefings/A191_(NB76)_Scotland_and_renewables.pdf)

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- ⁷ Letter to Scotsman 27th April 2011 <http://news.scotsman.com/letters/Letter-Powerful-case-againstrenewables.6758344.jp?articlepage=2> The seven signatories were: Keith Anderson CEO Scottish Power Renewables; Allan MacAskill Business development director SeaEnergy Renewables; Roy MacGregor Chairman, Global Energy Group; Martin McAdam Chief executive officer, Aquamarine Power; Richard Yemm Chief technical officer Pelamis Wave Power; David Maxwell Steel Engineering managing director; John Robertson Managing director Burntisland Fabrications.
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