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This briefing does not necessarily deal with the UK Government's proposed new reactor programme. For an update on developments to do with new reactors see here:

<http://www.no2nuclearpower.org.uk/nuclearnews/NuClearNewsNo87.pdf>

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<http://www.microgenscotland.org.uk/news/>

1 Torness and Hunterston B Life Extensions

As previously reported the Office for Nuclear Regulation (ONR) is currently looking at the Periodic Safety Review (PSR) for Hunterston B (1) If ONR approves it the station will be almost 50 years old when it finally closes in 2023. EDF Energy has also announced that it plans to extend the life of Torness nuclear power station by 7 years to 2030. (2) This is just an announcement of EDF's intentions. Torness will still have to undergo a Periodic Safety Review in 2019, but EDF would not have made the announcement without consulting ONR first.

Now Green MSP Mark Ruskell has challenged Scottish Ministers to close a loophole that allows nuclear power plants to have their operating life extended without public input. At the moment Periodic Safety Reviews don't require an Environmental Impact Assessment (EIA), so the public have no say in whether stations such as Torness or Hunterston are allowed to operate beyond their previously agreed lifespan. However, the Scottish Government has just launched a consultation on amending the rules around EIAs, prompted by an EU directive aimed at protecting the environment.

Ruskell said: "*The public are being denied a say in decisions that have huge implications for the local environment and future generations. Communities who have nuclear power stations on their doorstep should be properly consulted. Operators of nuclear plants should be made to show their environmental impact compared to alternative forms of energy generation or energy efficiency. Nuclear with its toxic legacy and eye watering costs should have no place in Scotland's future energy mix. We must close this regulatory loophole before a decision on the latest Hunterston safety review is reached in January, and similarly Torness in 2019/20. We must reassert authority over the nuclear industry and give our communities a real say.*" (3)

1. Hansard, Nuclear Power Stations: Safety: Written question – 200777, answered 23rd June 2014 <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2014-06-16/200777/>
2. BBC 16th Feb 2016 <http://www.bbc.co.uk/news/business-35583740>
3. Scottish Green Party 11th Aug 2016 <https://greens.scot/news/communities-with-nuclear-plants-should-be-properly-consulted>

2 Higher Activity Waste Strategy

The NFLA responded to the Nuclear Decommissioning Authority's new Higher Activity Waste (HAW) Strategy at the end of June.

The response can be found here: http://www.nuclearpolicy.info/wp/wp-content/uploads/2016/06/Rad_Waste_Brfg_64_NDA_HAW_policy.pdf

Higher Activity Waste (HAW) is a category of radioactive waste which includes High Level Waste (HLW), Intermediate Level Waste (ILW) and a small volume of Low Level Waste (LLW) that is not deemed suitable for disposal at the Low Level Waste Repository (LLWR) near Drigg or the LLW facility at Dounreay.

Scotland does not have any High Level Waste, but it does have Intermediate Level Waste which falls into the Higher Activity Waste category. Spent fuel, which is still being generated at Torness and Hunterston, is not currently classified as waste. All the spent fuel from Chapelcross and Hunterston A has already been removed and transported to Sellafield.

Scottish Government policy, unlike policy in England and Wales, is for the long-term management of Highly Active Waste (HAW) is for it to be 'disposed' of in near-surface facilities.

This new NDA HAW Strategy covers the whole UK and like previous LLW Strategies looks at the management of waste through the prism of the waste hierarchy which in the NFLA view is used as a way to justify transporting waste to other facilities and even other countries in order to carry out so-called "processing" or treatment which results in unnecessary discharges of radioactive substances into the environment and spreading waste around in alternative 'disposal' facilities all of which result in dilution and dispersal of radioactive substances throughout the environment.

The Strategy proposes using a so-called risk-based approach to divert some waste which was previously destined for 'disposal' in a Geological Disposal Facility to LLW disposal facilities or new near surface 'disposal' facilities; processing more waste, including by thermal treatment, and transporting more waste between sites.

In the NFLA view the NDA's HAW Strategy places too much emphasis on '*a risk-based approach to waste management*' where actually the calculation of risk is subject to huge uncertainty. Instead the emphasis should be placed on a clear set of environmental principles and a '*precautionary approach*.' Such an approach would argue for the management of waste on the site where it is produced (or as near as possible to the site) in a facility that allows monitoring and retrieval of the wastes.



The environment agencies Guidance on Requirements for Authorisation (GRA) on Near Surface Disposal Facilities for Solid Radioactive Waste (Near Surface GRA) says that a risk level of 1 in a million or 10^{-6} per year is equivalent to a calculated dose of around 0.02mSv/yr, where the probability of receiving the dose is one. 0.02 mSv is the Basic Safety Objective set as a target for new nuclear installations, or waste facilities by the Office for Nuclear Regulation. But the GRA also says that in situations where the probability of receiving a dose is less than one, doses could be greater. (1)

In other words the NDA is asking us to accept potential doses which are higher than the Basic Safety Standard on the basis that its modelling of the likely behaviour of radioactive substances in the environment surrounding a near surface disposal facility is accurate and trustworthy.

NFLA believes this level of flexibility in the permitted dose from near surface ‘disposal’ sites is unacceptable. This will be particularly pertinent when it comes to looking at Scottish proposals for near surface ‘disposal’ facilities.

The Scottish Government’s policy of near-surface ‘disposal’ requires that: *“Developers ... demonstrate how the facilities will be monitored and how waste packages, or waste, could be retrieved.”* NFLA has called for this caveat to be reflected in the NDA Strategy for England and Wales.

Hunterston Waste Progress

Intermediate Level Waste (ILW) was transported via underground tunnels into one of 5 above-ground bunkers built between the 1960s and 1980s. Nearly 50 years after these 5 concrete waste bunkers were built work has been going on to empty them. Using remotely operated vehicles, more than 650 tonnes of radioactive graphite and metallic waste have been lifted into specially engineered stainless steel boxes.

Hunterston A’s fuel elements were unique, incorporating a graphite sleeve which was stripped from the irradiated uranium during discharge from the reactors, along with associated metallic components. Consequently Hunterston holds the largest inventory of solid Intermediate Level Waste (ILW) in the Magnox fleet, accounting for more than 35% of the 7,500 cubic metre total. The Solid Active Waste Bunker Retrieval (SAWBR) Project was established to retrieve material and empty the bunkers in sequence (bunkers 5, 4, 3, 2, then 1) by breaking through the walls.

Bunker 5 was emptied last year. Now bunker 4 has been emptied 6 weeks ahead of schedule. To date, 336 packages of solid ILW have been retrieved from the two bunkers, packaged and transported into the ILW Store, representing approximately 30% of waste in the five bunkers. (2)

Submarine Waste

The MOD has announced that intermediate level radioactive waste from decommissioned nuclear-powered submarines will be stored at Capenhurst in Cheshire. AWE Aldermaston has been chosen as a fall back. The site at Capenhurst will be responsible for storing the Reactor Pressure Vessels (RPVs), classified as Intermediate Level radioactive Waste (ILW) from decommissioned nuclear-powered submarines. Reactor Pressure Vessels are thick steel containers that held nuclear fuel when the reactors operated. The site will store these on an interim basis until permanent disposal in a UK Geological Disposal Facility (GDF) sometime after 2040.



1. Near-surface Disposal Facilities on Land for Solid Radioactive Wastes Guidance on Requirements for Authorisation, Environment Agencies, February 2009
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296507/geho0209bpjl-e-e.pdf
2. NDA 16th June 2016 <https://nda.blog.gov.uk/2016/06/16/radioactive-waste-at-hunterston-in-scotland/>
3. MOD 7th July 2016 <https://www.gov.uk/government/news/mod-selects-nuclear-storage-site-as-submarine-dismantling-project-progresses>

3 Dounreay and Nuclear Transports

Highlands Against Nuclear Transport (HANT) has expressed concern (1) about the implications of the grounding of the semi-submersible rig Transocean Winner at Dalmore in the Western Isles whilst under tow from Norway to Malta for eventual decommissioning in Turkey for several reasons:-

- The passage should never have been undertaken when storm force winds had been forecast for several days;
- The company providing the towing tug appears to have broken international maritime law by not having an ocean-going master and crew on the rig whilst under tow which could have taken several actions such as lowering one of the vessel's 8 anchors or reconnect the tow
- A single tow of this kind should not have been attempted without a backup vessel in attendance in case of breakdowns or the tow line parting;
- 280 metric tonnes of diesel oil were being carried on the rig and this is now leaking causing environmental damage and risks to tourism, fishing and aquaculture which form an important part of the Western Isles economy; 53 tonnes has already leaked; (2)
- The recommendations of the Donaldson report after the grounding of the Braer on Shetland in 1993 should now be fully implemented with at least 2 Emergency Towing Vessels based around Scotland's coast.

This maritime disaster once again highlights the need for an Emergency Towing Vessel based in Stornoway which HANT has campaigned for since 2013 with support from many politicians and local authorities. If a similar incident were to take place involving a ship carrying nuclear materials from Scrabster to Barrow the result could be catastrophic.

HANT has called for all shipments of nuclear waste through the Minches to be halted as it is unnecessary. All nuclear waste can and should be stored at Dounreay.

Dounreay and Jobs

Firms in Caithness are making a transition from a reliance on work from Dounreay to new opportunities in renewable energy, say business leaders. Companies established in the area because



of the proximity of Dounreay such as JGC have been finding work on the MeyGen tidal energy scheme. The Beatrice Offshore Windfarm off Wick is also expected to create new jobs.

Thurso engineering firm JGC works on contracts related to Dounreay, but has also been constructing large ballast blocks for tidal turbines for the MeyGen project. The tidal energy scheme in the Inner Sound of the Pentland Firth, an area of the sea that separates the Scottish mainland and Orkney, will initially involve four turbines. Cables to bring ashore the electricity generated by the devices have already been laid. Atlantis Resources, the developer, hopes to later expand the project to up to 269 turbines.

Caithness Chamber of Commerce said the construction of the £2.6bn Beatrice Offshore Windfarm should bring further opportunities. More than 80 turbines could be installed in the Outer Moray Firth with construction work expected to start next year. The harbour at Wick, once a busy fishing port, will be used for the shipping in and out of equipment, turbines and construction workers. It is due to be operational in 2019, but there is going to be a lot of work prior to that. (3)

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1. HANT 11th Aug 2016 <http://hant.co.uk/news-item-13>
 2. Aberdeen Press and Journal 11th Aug 2016
<https://www.pressandjournal.co.uk/fp/news/islands/998692/grounded-oil-rig-lost-53-tonnes-diesel/>
 3. BBC 2nd June 2016 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-36433514>

4 Scotland's Energy Strategy

On 15th March Fergus Ewing, the then Scottish Minister for Business, Energy and Tourism, set out plans to develop a new holistic energy strategy. The strategy would encompass demand reduction, energy efficiency, a balanced energy generation mix, a role for storage, and the requirement for a low carbon transition in transport and heat use. **A consultation will be published before the end of 2016.**

Since then a conference held in June, called Scotland's Renewable Future, generated a 'first draft' of the new Scottish Energy Strategy for the Scottish Government. While the newly-appointed Scottish energy minister and trade and industry secretary take time to come up to speed with their new portfolios, leading figures in the Scottish renewables sector set out to save them some time.

Notwithstanding the greater UK-constitutional realities under which the Scottish Government does not have full control of all the economic levers, the industry wants to see clear and positive leadership – as well as much more, and much faster, progress. A draft new Scottish Energy Strategy might include:

- De-carbonise heating and transport, with specific and measureable milestones and with pre-set annual percentages for the public sector (health, education, local government, emergency services, etc);

- Develop and implement the following specific policies to create new employment in Scottish renewables sector:
- Greater support – including specific policy goals and measurable milestones – for solar power.
- Greater support – including specific policy goals and measurable milestones – for using one of Scotland’s biggest natural resources (cold water) for heatpumps in housing;
- Clear policy, practice and delivery, on energy storage – notably battery storage for solar PV systems;
- Clear policy objectives for ‘smarter grids’ and active network management – ie policy-led practice rather than ‘simple’ technology-led ‘silo-working’ – ie a ‘system-wide’ approach.
- A supportive policy framework to give both on- and off-shore wind time to become subsidy-free;
- A focussed and targeted unit aimed at supporting the development of a Scottish wind turbine and blade manufacturing sector (in the same way, for instance, that Scot-Govt stepped into create Wave Energy Scotland following high-profile corporate collapses in the sector);
- Clear and specific policy goals and measurable milestones for carbon-capture and storage (rather than political grand-standing and party point-scoring);
- Clear and specific policy goals and measurable milestones for hydro-power;
- Clear and specific policy goals and measurable milestones for marine/ocean energy. (1)

The new Scottish Energy Minister has already accepted one the ‘big wishes’ from Scotland’s Renewable Future forum – to embed a ‘systems-wide’ approach de-carbonising the heat and transport sectors. Paul Wheelhouse flagged up a clear direction of ‘system wide’ travel for the Scottish-Government’s new Scottish Energy Strategy. (2) He said:

“Our approach to heat in particular offers many exciting opportunities – not only helping us to deliver on our climate change ambitions, but also contributing to our efforts to promote growth and tackle inequalities – particularly fuel poverty. We are developing a new, overarching Energy Strategy for Scotland, which means developing a ‘whole systems approach’ considering Scotland’s energy supply and consumption as equal priorities, and building a genuinely integrated approach to power, transport and heat.”

The Scottish Government said *“the suggestions you’ve made will be carefully considered. Many of the points you’ve raised overlap with key issues identified by the Scottish Government already.”* (3)

Targets for 2030

Ahead of the publication of the consultation document on a Scottish energy strategy, environment groups and the Scottish Renewables trade body have called on ministers to set a target for half of

Scotland's entire energy needs to be met from renewables. Although 57.7% of Scotland's electricity needs now come from renewables, this is less than 13% of our total energy needs, so it's now time to widen our attention to de-carbonising our economy beyond just the power sector. Setting higher ambition for covering all of our energy needs would help give clarity about the transition and the greater certainty to investors. (4)

RSPB Energy Vision

The Royal Society for the Protection of Birds (RSPB) must be in the Scottish Government's bad books at the moment after winning a legal action against them for granting planning permission to four offshore wind farms with a combined installed capacity of 2.3GW in the outer Forth and Tay estuaries. The Scottish Government has lodged an appeal (see below). (5)

Nevertheless the RSPB has called for a renewed commitment to renewable energy. Although the group strongly resists renewable energy proposals where they have unacceptable wildlife impacts it supports large-scale expansion of carefully-planned renewable energy across the UK, and does not object to over 90% of sites. It has now produced 'The RSPB's 2050 Energy Vision', (6) which shows how the UK can deliver its climate targets using ambitious levels of renewable energy, without major risks to sensitive species and habitats. It concluded that renewable energy should be prioritised in the UK's energy strategy, with continued growth of onshore wind, solar and offshore renewables in addition to reducing energy demand. The report also highlighted major opportunities to develop renewable energy in deeper waters around the UK, using innovative technologies like floating turbines to harness strong winds further offshore.

In total, the RSPB's spatial analysis shows that between 5,558 and 6,277 TWh/year could be generated with low ecological risk by renewable energy technologies in the UK. The UK's final energy consumption in 2014 was 1661TWh, suggesting that, if appropriately sited, approximately four times the UK's current final energy (not just electricity) consumption could be generated from renewables, with low ecological risk.

Scotland consumed 144TWh of energy in 2013. (7). The RSPB research shows that more than three times the current level of onshore wind in Scotland could be achieved with low risk for wildlife - up to 41 TWh/year. Repowering existing well planned sites may be an opportunity to increase capacity at low ecological impact.

The group says there is very limited capacity for fixed offshore wind (up to 2.3 GW installed capacity) in shallow waters without significant risks to wildlife, unless knowledge of impacts improves, enabling ecologically sustainable development. But there is vast potential for floating wind in deeper waters, and there are also large areas potentially suitable for wave energy generation at low ecological risk, if the industry is supported to enable commercialisation.

Across the whole UK the picture is similar with major potential for onshore wind, floating wind turbines and solar farms. RSPB estimates that solar farms could generate up to 246 TWh/year with low ecological risk (taking account of impacts on food production and land-use change), and onshore wind up to 140 TWh/year. But they didn't map rooftop solar and estimate this could contribute a further 182 TWh/yr. The results show very high potential for offshore wind technologies with low ecological risk, generating up to 5,673 TWh/year – equivalent to almost three and a half times the

UK's current final energy consumption. The majority of sea areas identified as suitable are far from the shore, so in the case of offshore wind would require the commercialisation of floating turbines which can be used in deeper waters.

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1. Scottish Energy News 6th June 2016 <http://www.scottishenergynews.com/scotlands-renewable-future-delivers-draft-new-scottish-energy-strategy/>
 2. Scottish Energy News 7th June 2016 <http://www.scottishenergynews.com/scots-energy-minister-accepts-call-from-scotlands-renewable-forum-for-system-wide-approach-to-de-carbonising-heat-and-transport-in-new-scottish-energy-strategy/>
 3. Scottish Energy News 8th July 2016 <http://www.scottishenergynews.com/scottish-energy-minister-welcomes-draft-energy-strategy-from-scotlands-renewable-future-forum/>
 4. Business Green 8th June 2016 <http://www.businessgreen.com/bg/news/2460770/scottish-sunshine-brings-strong-solar-energy-boost>
 5. Scottish Energy News 8th Aug 2016 <http://www.scottishenergynews.com/rspb-calls-for-uk-government-to-support-deep-water-renewable-energy/>
 6. The RSPB's 2050 Energy Vision, http://www.rspb.org.uk/Images/energy_vision_summary_report_tcm9-419580.pdf
 7. Energy in Scotland 2016 <http://www.gov.scot/Resource/0050/00501041.pdf>

5 Renewable Energy Sector in Scotland – Westminster Inquiry

The Scottish Affairs Select Committee in Westminster has published a report which highlights the great successes that have been made in expanding renewable energy capacity in Scotland, but warns that recent changes in UK policy have created uncertainty which threatens the industry's prospects for further growth.

The Committee concluded that there is a significant risk that recent policy changes, and in particular the UK Government's decision to end all new subsidies for onshore wind, will mean that the Scottish Government is unable to achieve its goal of generating the equivalent of 100% of Scotland's electricity needs from renewable technology by 2020.

The Committee found that significant growth of the renewable sector in Scotland in recent years has demonstrated the benefit of a supportive policy environment. An estimated 21,000 people are now employed in the Scottish renewable sector, which produces almost 30% of the UK's renewable electricity. However recent changes to subsidies for renewables and uncertainty about future support have affected the confidence of investors in supporting the deployment of new generating capacity. Over 13 GW of new capacity is in the planning or development stages, almost twice the capacity currently deployed in Scotland. Not all of this additional capacity is likely to be deployed, but this figure gives an indication of the opportunities for further growth of Scotland's renewable sector. The removal of subsidy for onshore wind in particular, one of cheapest renewable sources,



without consultation with the industry or Scottish Government is considered particularly troubling. (1)

In 2014 Scotland had over 60% of the UK's onshore wind capacity (and over 40% of all wind capacity), 85% of wave and tidal capacity and over 85% of hydro capacity. The fact that cuts fall particularly heavily on onshore wind, where the majority of capacity is deployed in Scotland, means that these changes will have a disproportionate impact on the prospects of Scotland's renewable sector. Scottish Renewables told the Committee that early closure of the Renewables Obligation to onshore wind will cost Scotland up to £3 billion in lost investment and put 5,400 jobs at risk. Recent changes will mean Scotland could potentially lose out on significant additional investment and job creation. It is of serious concern that the UK Government implemented these changes without assessing the impact they would have on Scotland.

The Government has consistently stated that recent policy changes were made in response to the projected overspend of the Levy Control Framework, but the actual changes show little sign of being part of a strategic plan for energy policy. The changes which have been made have been announced, consulted on (where consultation has occurred at all) and implemented in an ad hoc manner, and there is little indication of why certain technologies or support mechanisms have been cut in favour of others. Andy Kerr, Executive Director of Edinburgh Centre for Carbon Innovation, told the Committee that there have been *"a series of announcements that came in at very short notice"*, and this meant businesses were *"immensely frustrated"*.

The Committee agreed with a recommendation from the Energy and Climate Change Committee that the Government should set out how any future projected overspend of the Levy Control Framework would be dealt with. The Government should establish procedures for the communication of any future projected overspend, and also the Government's response to that overspend. This should be developed with a view to ensuring the renewables sector is as well-informed as it can be as soon as possible, and that it is transparent how the Government has come to its decisions.

It is also regrettable that the second round of Contracts for Difference has been delayed by at least a year. This has created a void where renewables projects have been unable to progress because there is no support mechanism available to them. This stop-start funding is bad for investor confidence and for the maintenance of supply chains, which are most efficient when there is a stable policy framework and steady stream of support.

Some of the best natural resources for generating renewable electricity are found on the Scottish Islands. However, adequacy of connections to the electricity grid, and costs are a particular issue for these islands. The Committee recommended that the UK Government include Remote Island technology in the list of less established technologies which will be eligible to bid for funding in the next round of Contracts for Difference. Strike prices for this category should be set at a rate which will enable sufficient deployment to allow for improved transmission infrastructure to be installed between the Scottish Islands and the mainland. The Committee has called on Ofgem to look into levelling connection costs across the UK and calls on the UK Government to take action to support the improvement of infrastructure between the Scottish Islands and the mainland.

SSE told MPs that there will be no connections to the UK grid from Scotland's 'energy isles' until 2020 at the earliest. Andrew Huthwaite, the transmission development director at SSE said: "*The earliest we are feasibly looking at for mainland UK Grid connections is by December 2020 for the Western Isles, by March 2021 for Shetland and by 2022 for Orkney.*" (2)

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1. House of Commons Scottish Affairs Committee 25th July 2016 <http://www.parliament.uk/business/committees/committees-a-z/commons-select/scottish-affairs-committee/news-parliament-2015/renewable-energy-scotland-report-published-16-17/>
 2. Scottish Energy News 10th June 2016 <http://www.scottishenergynews.com/no-grid-connections-for-orkney-shetland-and-western-isles-until-2020-at-earliest-sse-tells-mps/>

6 Climate Targets

Scotland had already exceeded its 2020 carbon reduction target in 2014, the Scottish government announced, having reduced its emissions by 46 % compared to 1990 levels. Climate change secretary Roseanna Cunningham confirmed that Scotland's target to reduce emissions by 42% by 2020 was exceeded six years early in 2014.

Cunningham said Scotland is making "*outstanding progress*" in greenhouse gas emission cuts, adding that Holyrood will now set a higher 2020 target.

The reduction in residential emissions in 2014 may have been due to people turning down their heating, she said and this "*underlines that small individual actions, if repeated on a large scale, can have a big impact in tackling climate change*".

While environmental groups welcomed the news that the target has been hit, some argued policies need to go much further. Stop Climate Chaos Scotland said apart from the electricity and waste sectors, it's hard to see a bold fingerprint from the Scottish Government. "*This target has been met because of the loss of heavy industry, warmer winter weather, our changing share of European emissions credits and some government policies. The challenge ahead is to tackle the sectors where there's been little change to date, like transport where our emissions remain stalled at 1990 levels and housing (which includes domestic heating) where emissions have reduced only one per cent since the Scottish Climate Change Act was passed.*"

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1. Business Green 14th June 2016 <http://www.businessgreen.com/bg/news/2461503/scotland-exceeded-2020-emissions-target-in-2014>



7 District Heating –30% cheaper than individual gas boilers

Scotland's leading district heat network is set to grow with an £11 million investment plan, after Aberdeen councillors unanimously backed plans to expand the network into the south of the city – offering hundreds of homes savings on their energy bills.

The combined heat and power (CHP) scheme is expected to deliver low cost, low carbon energy to at least 350 homes in Torry as well as a primary school, swimming pool, community centre and various commercial properties in the East Tullis Industrial estate. The existing CHP system has reduced the city's carbon emissions and saved the average electrically heated home up to £18 a week on energy bills – therefore helping thousands of residents climb out of fuel poverty. Aberdeen Heat and Power (AHP) has grown substantially since the initiative began in 2002 and currently provides for 2,361 flats in 33 multi-story blocks and two sheltered housing blocks in Seaton, Tillydrone, Hazlehead and Stockethill and 13 public buildings. (1)

Big Six utility SSE has published a new report (2) which makes the case for increased use of district heating to help combat heating efficiency and affordability. The report – *'Sustainable Heating: Reducing Costs, Improving Comfort and Lowering Carbon Emissions'* – found that one retrofit project at the Wyndford housing scheme in Glasgow has delivered a 62% reduction in CO₂ emissions since it was installed in 2012. The results also show that lives have significantly improved, comfort has increased, and jobs and economic value have been created. (3)

SSE says it is one of the UK's leading providers of district heat networks, with 11 heat networks serving over 5,000 customers across the UK and this number set to treble in the near future. Heat accounts for a significant proportion of final energy demand and is one of the major contributors of emissions across the UK. In Scotland alone, heat is the largest element of energy use (more than 55%), and contributes 47% of total carbon emissions, with Scottish households and business spending £2.6bn on heating and cooling. Changing the way heating requirements are met presents a significant source for potential decarbonisation.

For a district heating network heat can be taken from a range of sources including large heat pumps, combined heat and power plants and deep geothermal plants, which take heat from underground rocks miles below the surface of the earth. It is then pumped around homes and businesses bringing down the cost of energy bills and reducing carbon emissions. Without a network, it is impossible to re-use this heat and it simply gets dumped into the atmosphere. In Islington for example, they are expanding their existing heat network at Bunhill so that it can take heat that comes out of the London Underground (Northern line) and put it into their network.(4)

Dr Tim Rotheray, Association for Decentralised Energy director, said district heating has a key role to play decarbonising heat in the UK. "*Industry will continue to work with Government to make sure that this money can bring forward low carbon heating projects at best value to the consumer,*" he promised. In the UK currently only about two per cent of heat is supplied via heating networks - in comparison, in Denmark 60 per cent of the population is connected to a heat network. As well as delivering significant carbon savings, district heating systems can also cut energy costs for billpayers

– heating a flat via a gas-fired district heating system costs around 30 % less than it would be using individual gas-fired boilers. (5)

In March the Scottish Government’s Expert Commission on District Heating recommended that local authorities should be required to develop and publish a strategic plan for developing district heating in their area. Dr Sam Gardner, head of policy at WWF Scotland, a member of the Commission, said while just 1% of Scotland’s heat demand is currently supplied by district heating, research suggests this needs to jump to 40% by 2030 in order for Scotland to meet its climate targets. (6)

The Commission’s Working Group on Regulation has recommended:

- Local authorities are each required to develop and publish a strategic plan for developing district heating in their area;
- Local authorities should have the power to require buildings with a significant heat load (as defined in consultation with stakeholders) to connect to a district heating network where such a network can offer heating at a competitive cost;
- A single set of national technical standards for district heating systems, to be developed by the Scottish Government working with the district heating industry and other stakeholders;
- Implementation of an appropriate statutory licencing regime for district heating operators in Scotland, which would include service and technical standards and measures to prevent operators exploiting a monopoly position to over-charge customers.’ (7)

David Pearson, director of Glasgow-based Star Renewable Energy, said: “...with the right regulation in place, whole towns and cities can benefit from affordable, clean heat through district heating. Scotland is making good progress on renewable electricity, but without the right regulatory framework we’ll lose out on the investment, jobs and economic renewal opportunities that district heating could deliver. The requirement is simple: where heat is offered at lower cost as can be achieved from large heatpumps, developers are required to use it. Win-win.”

Professor Jan Webb, of the University of Edinburgh, added: “Evidence from European countries with much more district heating than we have shows the value of a basic regulatory framework for both investors and customers. The Netherlands, Norway, Denmark and Sweden all use regulation to secure investment in the infrastructure, at a long-term affordable cost of capital, as well as ensuring good standards of practice by operators and fair pricing for customers.” (8)

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1. Scottish Energy News 4th July 2016 <http://www.scottishenergynews.com/scotlands-leading-housing-heat-network-set-to-grow-with-11-million-investment-plan/>
 2. Reducing Costs, Improving Comfort, and Lowering Carbon Emissions: Learning from the impacts of the Wyndford Estate district heating project, <http://sse.com/media/408769/WYNDFORD-REPORT.PDF>
 3. Scottish Energy News 30th June 2016 <http://www.scottishenergynews.com/glasgow-tenants-warmer-and-happier-with-district-heating-scheme/>
 4. Scottish Energy News 1st July 2016 <http://www.scottishenergynews.com/decc-asks-industry-on-how-best-to-spend-300m-on-district-heating-schemes/>

5. Business Green 30th June 2016 <http://www.businessgreen.com/bg/news/2463289/urban-heat-networks-set-to-receive-gbp320m-government-funding-boost>
6. Business Green 31st May 2016 <http://www.businessgreen.com/bg/news/2459830/msps-and-industry-call-on-scottish-government-to-boost-district-heating>
7. Work of the Special Working Group on Regulation, Scottish Government March 2016. <http://www.gov.scot/Resource/0049/00497892.pdf>
8. Scottish Housing News 31st May 2016 <http://www.scottishhousingnews.com/9510/scottish-government-urged-to-deliver-on-warm-homes-act-promise/>

8 Fuel Poverty

The Scottish Government has finally – and formally – admitted that it will not meet its target to end fuel poverty in Scotland. It has a statutory duty under the Housing (Scotland) Act 2001 to ‘ensure, so far as reasonably practicable, that people are not living in fuel poverty in Scotland by November 2016’. Until now, Scottish Ministers have insisted that they remained committed to the target despite all indications that the gulf could not be bridged. With the most recent official figures for the year 2014 showing that around 35% of Scottish households remain in fuel poverty, it was clear that efforts would not be sufficient. There are around 845,000 households in fuel poverty in Scotland. (1)

The Independent Scottish Fuel Poverty Strategic Working Group updated the Housing Minister on their interim findings at the end of June. The Chair of the expert group Professor David Sigsworth OBE informed the Minister that the fuel poverty target will not be met this year. He also outlined that the group’s formal report, which will be published later this year, is likely to include recommendations on reviewing the definition of fuel poverty, a renewed strategy and targets for eradicating fuel poverty, and a balanced focus on the causes of fuel poverty. Responding to the findings the Housing Minister, Kevin Stewart, updated parliament, confirming the Government’s commitment to eradicating fuel poverty and outlining the progress made so far. (2)

In 2002 the Scottish Government committed to eradicating fuel poverty as far as is reasonably practicable by November 2016. As this target is impossible to meet Scotland now needs a comprehensive and realistic new strategy to improve domestic energy efficiency in order to eliminate fuel poverty and eradicate Scotland’s scourge of cold homes. It’s time for solid deliverable plans not more grand aspirations without a strategy to deliver them. In April the Existing Homes Alliance compiled some excellent data which revealed there are an estimated 1.5m ‘cold homes’ in Scotland – homes with Energy Performance Certificates ranging between D to F ratings. (3)

One element of the research from the Existing Homes Alliance was crystal clear – rural and remote communities in Scotland have a larger problem with energy inefficient homes. Argyll and Bute, Banffshire and the Buchan Coast, Caithness, Sutherland, Ross, Dumfriesshire, Eastwood, Na h-Eileanan an Iar, Orkney Islands, Shetland Islands, Skye, Lochaber, and Badenoch were among the remote constituencies where three quarters or more of the housing stock were estimated to have Energy Performance Certificates rated from D to F.



Scotland's next big capital project should be investment in making homes energy efficient. The forthcoming Spending Review should include significant investment in a National Infrastructure Priority for energy efficiency, with an overall goal for all housing to be warm and healthy by 2025.

Such a move, say campaigners, would help the 35% of households in Scotland currently in fuel poverty, save the NHS money and create new jobs. Unlike other infrastructure projects, these jobs would be spread around every part of Scotland, creating and sustaining many small and medium sized businesses. The Existing Homes Alliance brings together conservation, environmental as well as health organisations. Alan Ferguson, chair of the Alliance said:

"It's well accepted that investment in infrastructure is good for the economy, but a major investment in energy efficiency will also help tackle fuel poverty, address health inequalities and reduce our climate change emissions. In addition, such a move would create up to 9,000 jobs, spread across all of Scotland, unlike other infrastructure projects. No other capital investment can make such a social and economic difference to every part of the country, making investment in ending 'cold homes' an infrastructure investment of truly national importance."

Irene Johnstone, head of the British Lung Foundation in Scotland said *"the Scottish Government needs to increase its emphasis on preventing poor lung health and that cold, damp and mouldy homes cause illnesses, It therefore seems obvious that improving the condition of Scotland's homes is a key component to the overall preventative healthcare agenda"*.

Fabrice Leveque, climate and energy policy officer at WWF Scotland added: *"A recent independent Infrastructure Task Force identified energy efficiency as one of the three types of low-carbon infrastructure most in need of investment from the Scottish Government. A political commitment that no-one should live in a hard-to-heat, draughty home would be good for millions of households, and would drastically reduce emissions too."* (4)

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1. Scottish Energy News 30th June 2016 <http://www.scottishenergynews.com/scot-govt-admits-it-has-missed-its-target-in-cutting-national-fuel-poverty/>
 2. Scottish Government 29th June 2016 <http://news.scotland.gov.uk/News/Fuel-Poverty-Strategic-Working-Group-25cd.aspx>
 3. Scottish Housing News 9th June 2016 <http://www.scottishhousingnews.com/9673/blog-scotland-needs-comprehensive-fuel-poverty-strategy-not-unrealistic-targets/>
 4. Third Force News 3rd June 2016 <http://thirdforcenews.org.uk/tfn-news/next-big-investment-must-be-in-efficient-homes>

9 Offshore Wind

Scottish Energy Minister Paul Wheelhouse formally launched the start of development work to build the £2.6 billion Beatrice offshore windfarm in the Moray Firth. Wheelhouse joined Global Energy Group Chairman, Roy MacGregor, and senior managers from SSE (the biggest single equity-holder in the project) and Siemens for a multi-million pound contract signing at Nigg Energy Park.



Siemens has been contracted to supply 84 x 7MW turbines to the project, as well as two offshore transformer units in place of a traditional substation. When completed in 2019, Beatrice will provide 588-MW of power – sufficient power for 450,000 homes (and three times the actual number of households in the Moray and Highland regions). Beatrice is expected to provide an average annual gross employment in Scotland of over 890 jobs during construction and will be one of Scotland's largest private infrastructure projects. Offshore construction will begin in 2017. (1)

Siemens will use Nigg Energy Park for assembling turbines from spring 2018. (2)

Fife-based Burntisland Fabrications Ltd (BiFab) has also secured work on the Beatrice Windfarm. The company will manufacture 26 offshore jacket substructures for the scheme. BiFab said the work would involve its sites at Arnish on the Isle of Lewis and Burntisland and Methil in Fife. Ten of the structures are to be delivered next year and 16 in 2018. (3)

WWF Scotland director Lang Banks stated: *“The Beatrice offshore wind farm project alone will almost quadruple our offshore wind capacity, helping to reduce our greenhouse gas emissions as well as creating jobs and supporting local economic renewal.”* (4)

Floating wind

Two engineering and design firms are working together to deploy the world's first multi-turbine floating wind-energy demonstrator off Dounreay in 2018. Sweden-based Hexicon appointed WS Atkins as its engineering partner last year to help design the pioneering offshore wind technology. The floating “wind farm” will consist of two turbines fixed onto a single semi-submersible platform, with a total capacity of 8 to 12 megawatts. Norwegian energy giant Statoil has its own plans for a floating wind farm off Aberdeenshire, with electricity slated to hit the grid in late 2017. (5)

A new design of floating turbine has been successfully demonstrated in Glasgow as the collaboration behind it says it is nearing readiness for a full commercial test. The TLP WIND project – led by Iberdrola Engineering & Construction and bringing together the expertise of the Offshore Renewable Energy Catapult (OREC) and Strathclyde University – has developed a Tension Leg Platform (TLP) turbine foundation to deliver a lightweight and stable solution for floating wind.

The Scottish Government has awarded £1.5m of funding to the Carbon Trust to support its Offshore Wind Accelerator (OWA) research and design programme aimed at increasing innovation, reducing costs and encouraging further investment.

The OWA is a joint industry project which has grown to involve nine offshore wind developers – DONG Energy, E.On, EnBW, RWE Innogy, Scottish Power, SSE, Statkraft, Statoil, and Vattenfall. (6) Over the next four years the nine companies will also collectively invest at least £6.4m bringing the total sum up to £7.9m. (7) The collaboration hopes to bring new technology innovations to market to reduce offshore wind costs to below £100 per MWh by 2020. (8)

Offshore wind appeal

The Scottish Government has lodged an appeal following a recent court decision in Scotland to withdraw consent from four offshore wind farms planned for Scotland, with a combined installed capacity of 2.3GW in the outer Forth and Tay estuaries.



In July the Court of Session in Edinburgh upheld an appeal by the Royal Society of Birds that the government had not given sufficient weight to the risks to marine birdlife in approving the plans for Mainstream Renewable Power's 450MW Neart na Gaoithe, SDIC Power's 784MW Inch Cape and SSE and Fluor's 1050MW Alpha and Bravo Seagreen wind farms. The 'smallest' one of these wind farms – Mainstream's – would be big enough to provide electricity for the whole of Edinburgh. (9)

Separately, Mainstream Renewable Power has also lodged an appeal regarding Neart na Gaoithe

Earlier this year, Contract for Difference funding was withdrawn for the Neart na Gaoithe wind farm after the project missed a key deadline due to the legal challenge from RSPB. RSPB's head of planning and development at RSPB Scotland, Aedán Smith, said it was "disappointing" the appeals had been lodged, as "we believe our case is sound and believe that the judgement was correct and robust. We will therefore defend the decision," Smith said. "However, we will also continue to work pro-actively with the Scottish Ministers and with the renewables industry to help ensure the delivery of much needed renewable energy developments in locations that do not threaten Scotland's most important wildlife sites." (10)

Former Energy Minister Brian Wilson claimed that offshore wind in Scotland is now pretty much dead. But Lloyd Austin for the RSPB said: *"It is simply not true to suggest that offshore wind is dead. Of course offshore renewable projects – in the right place – still have a bright future, and we look forward to working with developers to help them ensure their projects don't damage wildlife whilst exploiting Scotland's abundance of renewable resources."*

A spokeswoman for the Crown Estate, which leases the seabed and manages the rights to renewable energy out to 200 nautical miles, said "Scotland's offshore wind industry continues to strengthen, with nearly 150 turbines either operating or under construction and projects such as Beatrice in Moray Firth, which is set create hundreds of jobs and boost the economy by £680 million, progressing well". (11)

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1. Scottish Energy News 15th June 2016 <http://www.scottishenergynews.com/scottish-energy-minister-formally-launches-development-of-2-6bn-moray-firth-wind-turbine-farm/>
 2. BBC 15th June 2016 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-36528196>
 3. BBC 17th June 2016 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-36558640>
 4. Dundee Courier 15th June 2016 <https://www.thecourier.co.uk/fp/business/business-news/190610/nigg-secures-beatrice-windfarm-construction-project/>
 5. Energy Voice 17th June 2016 <https://www.energyvoice.com/otherenergy/112430/another-floating-wind-turbine-project-planned-north-sea/>
 6. Scottish Energy News 28th June 2016 <http://www.scottishenergynews.com/glasgow-demonstration-proves-iberdrola-concept-of-new-floating-wind-turbine-design/>
 7. Scottish Energy News 20th June 2016 <http://www.scottishenergynews.com/scot-govt-hands-over-1%2bd-million-to-carbon-trust-to-help-drive-down-offshore-wind-energy-costs/>
 8. Edie 11th July 2016 <http://www.edie.net/news/10/Scottish-Government-joins-developers-in-offshore-wind-collaboration/>

9. Scottish Energy News 9th Aug 2016 <http://www.scottishenergynews.com/scot-govt-launches-legal-appeal-to-rescue-botched-plans-for-four-major-offshore-wind-farms/>
10. Business Green 9th Aug 2016 <http://www.businessgreen.com/bg/news/2467410/mainstream-renewable-power-appeals-against-forth-of-firth-offshore-wind-court-ruling>
11. Scotsman 20th July 2016 <http://www.scotsman.com/news/environment/offshore-wind-power-pretty-much-dead-1-4182572>

10 Solar Power

Scotland's largest solar farm has officially opened in Perthshire on the Errol Estate near Perth. The 13MW scheme has been constructed on 70 acres of land and will ultimately provide power for more than 3,500 homes. Boosting solar was also one of the key points raised by Scotland's Renewable Future forum in its 'manifesto' for the new Scottish-Government.

This project is proof that large scale solar PV systems work well on the east coast of Scotland and the firm is continuing to source solar sites across Scotland, with a view to developing schemes that are financially viable without subsidy support. Overall, solar yield in this part of Scotland is almost as strong as south east England. Even though the Scottish climate is generally colder and wetter, the Sun shines for longer in the long Scottish summer. Due to reducing installation costs, and a climate of support from Scottish Government, there continues to be an appetite from solar developers to take forward new sites, even with reducing subsidy support from the Westminster government."

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1. Scottish Energy News 7th June 2016 <http://www.scottishenergynews.com/scotlands-largest-solar-power-parc-officially-opens-today-in-perthshire/>

11 Energy Storage

According to the *Daily Telegraph* cutting-edge research into cheap and clean forms of electricity storage is moving so fast that we may never again need to build 20th Century power plants in this country, let alone a nuclear white elephant such as Hinkley Point. The technology is poised to overcome the curse of 'intermittency' that has long bedevilled wind and solar. Surges of excess power will be stored for use later at times when the sun sets or the wind isn't blowing. (1)

Energy companies are pouring unprecedented sums of money into batteries and other power storage systems to transform the face of the UK's electricity industry. The relatively high cost of batteries has until now put this goal beyond reach but with prices more than halving in the past six years, growing numbers of companies are starting to sell storage systems, notably in the US and Germany. The UK lags behind but the past 12 months has seen a surge in companies testing the market. (2)



The former colliery town of Stanley in Co Durham has become the first to offer in-home batteries and solar panels for free in a joint scheme between the town council and a company called North Star Solar, and will be offered to all the town's 35,000 households. North Star's chief executive, Paul Massara, the former boss of Npower, said the combination of rooftop panels, a lithium battery and energy-efficient LED light bulbs would immediately cut power bills by 20%. The catch is that the council or homeowner must agree to a 23-year contract to allow the company to recoup its initial investment, plus make a return. The electricity rate is fixed annually and rises with inflation. (3)

Scotland has another storage option – pumped hydro electric storage (PHES). The hydroelectric dam at Ben Cruachan in Argyll has served as a key piece of Britain's infrastructure for over 50 years meeting peaks in UK demand. Hydro schemes can generate electricity at short notice – such as when half the country goes to make a cup of tea during the adverts in the middle of Coronation Street. Pumped storage schemes use surplus electricity to pump the water back up the hill to make sure it is available for use during the next peak. Now ScottishPower wants to expand Cruachan's capacity from 440 megawatts to 1,040 megawatts. It will submit a planning application this autumn. The UK's total pumped storage capacity is 2,800MW, with Scottish plants at Cruachan and Foyers, and Welsh schemes at Ffestiniog and Dinorwig. At least double that level is needed to provide enough storage to cope with the amount of wind being developed. Other projects are also being considered that could boost the UK's overall pumped storage capacity to 4,400MW. (4)

There is a real opportunity in finding ways of storing large amounts of energy for months at a time, according to a new book by Chris Goodall. We need technologies that take the increasing amounts of surplus power from sun or wind and turn this energy into storable fuels. Another way might be to convert cheap electricity from renewables into natural gas and into liquid fuels similar to petrol or diesel so provide huge buffers of energy storage.

Surplus electricity can be used to split water into hydrogen and oxygen. The hydrogen can be used to make methane gas for burning or turned them into liquids that can be kept in the oil storage networks. A few percent of the £30bn+ subsidy for Hinkley devoted to conversion technologies that can take cheap renewable electricity and use it to store energy in gas or liquids could help build British companies that could expand around the world. (5)

Orkney has the highest proportion of households generating their own electricity of anywhere in the UK, and generates more than 100% of its electricity needs from renewable sources. The export capacity of the subsea cables to the Scottish mainland and between the islands is limited, so it is now looking at smart technology and storage. With help from Heriot-Watt University, Solo Energy – a new 100%-renewable energy supplier business operating in Orkney – is pushing ahead with the installation of large numbers of actively managed distributed energy storage assets in homes and businesses. Solo Energy plans to create a demand-side energy storage network on Orkney, utilising battery storage technology in order to shift customers' energy supply from periods of peak demand and peak wholesale energy price, to periods of peak renewable generation and low demand / low wholesale energy price. (6)

1. Telegraph 10th August 2016 <http://www.telegraph.co.uk/business/2016/08/10/holy-grail-of-energy-policy-in-sight-as-battery-technology-smash/>



2. FT 8th June 2016 <http://www.ft.com/cms/s/b62b356e-2d10-11e6-bf8d-26294ad519fc.html>
3. Sunday Times 12th June 2016 <http://www.thetimes.co.uk/edition/business/free-panels-for-coal-town-as-energy-giants-face-solar-eclipse-p6mdstp93>
4. Times 4th July 2016 <http://www.thetimes.co.uk/edition/business/the-pipes-are-calling-for-green-generators-vtkjzm06p>
5. Ecologist 28th July 2016
http://www.theecologist.org/blogs_and_comments/commentators/2987951/dump_hinkley_and_invest_in_the_uks_real_energy_future.html
6. Scottish Energy News 4th Aug 2016 <http://www.scottishenergynews.com/solo-energy-to-set-up-new-renewable-energy-storage-network-on-orkney/>

12 Grid Connections

Another way to cope with the intermittency of renewables is to improve grid connections to other countries. The UK energy regulator Ofgem has just granted a licence to a Norwegian consortium to build a 345-mile power cable to connect Britain with Norway at Peterhead. The NorthConnect project aims to transport Norway's abundant hydro-power reserves in the south west of the country through a high voltage 1.4GW subsea cable to a substation at Peterhead. Under current plans the project will begin powering homes by 2022. NorthConnect could also allow the UK to export excess power at times of strong wind power output when demand is low. The exported power could be used in Norway's hydropower reservoirs, known as the 'green battery'. The reservoir operators use electricity to pump water up into the dam when power is cheap and later run the water back out of the dam over a power generation turbine to release energy back into the grid when it is needed.

There are currently four interconnectors to mainland UK, from France, the Netherlands, Ireland and Northern Ireland, with a combined capacity of 4GW. But ministers have said they would support a further 9GW of new interconnectors to help to improve security of supply by giving the UK access to power generated elsewhere. Other planned interconnector projects to the UK include extra links to France and Ireland as well as new connections with Belgium and Denmark

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