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This briefing does not 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/NuClearNewsNo79.pdf>

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1 Scottish Climate Change Targets

Scotland has missed its fourth annual climate change target in a row. Environment minister Aileen McLeod admitted she was "disappointed" the government's annual targets for greenhouse gas emissions had not been reached. Emissions fell by 3.6% between 2012 and 2013, to 53 million tonnes of carbon dioxide equivalent (MtCO₂e). When that total is adjusted to take into account the EU emissions trading system, the figure falls to 49.725MtCO₂e - above the target set by Scotland's climate change laws of 47.976 MtCO₂e for the year.

Dr McLeod insisted ministers had put together a "*comprehensive package of policies and measures*", announcing a new energy efficiency programme for all properties in Scotland, both residential and commercial. This "*has the potential to transform the energy efficiency of Scotland's housing stock*" she said. "*It will provide an offer of support for all buildings in Scotland to help them achieve a good energy efficiency rating over a 15- to 20-year period.*"

The Scottish Government has already increased its investment in domestic energy efficiency from £94 million last year to £119m this year, and since 2009 has committed more than £500m to tackling fuel poverty and energy efficiency, she said. (1)

Gina Hanrahan Climate & Energy Policy Officer at WWF Scotland says the cycle of annual failure could have been broken if ministers had responded to the repeated advice of its independent advisers, the UK Committee on Climate Change, and introduced policies to cut emissions from areas such as transport, agriculture and housing. The missed targets prompted a promising commitment from the Scottish Government to designate energy efficiency as a National Infrastructure Priority (Nip). If done properly, this will help to cut bills for the 940,000 homes in fuel poverty in Scotland, create new jobs in the insulation sector, cut excess winter deaths and other health problems associated with cold homes, relieving pressure on the NHS, and cut emissions.

The Existing Homes Alliance (EHA) – a coalition of environmental, anti-poverty, consumer, housing and building organisations - believes that designating energy efficiency as a Nip should mean the

Scottish Government putting together a comprehensive plan to upgrade some 130,000 homes a year, so that all homes achieve a C energy performance standard by 2025; invest substantially more funding from its capital budget; and make available a mix of grants for the fuel poor and low interest loans for those who are able to pay. Private funding will also have an important role to play. (2)

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1. Scotsman 9th June 2015 <http://www.scotsman.com/news/environment/scotland-misses-climate-targets-for-fourth-year-1-3797298>
 2. Herald 11th June 2015 <http://www.heraldscotland.com/comment/columnists/there-is-still-so-much-work-to-do-to-create-a-successful-low-carbon-scotland.128656890>

2 Renewable Heat Policy

The Scottish Government (SG) has published its final Heat Policy Statement <http://www.gov.scot/Publications/2015/06/6679/downloads> after consulting on a draft statement published in May 2014.

As mentioned in our June report Scotland risks missing its renewable heat target of 11% by 2020 unless a “major change of mindset” is adopted. It already missed an interim target of 3.5% by 2012 by 0.5%. (1) According to the Committee on Climate Change (CCC) the current pipeline of projects does not provide enough capacity to achieve the 2020 target. (2)

The Scottish Government’s ambition is to achieve a largely decarbonised heat system by 2050. In the interim it wants 1.5 TWh of Scotland’s heat demand to be delivered by district or communal heating (compared with the current non-electrical heat demand of around 80TWh) with 40,000 homes connected by 2020.

The Government has designating energy efficiency as a National Infrastructure Priority. The cornerstone of this will be Scotland’s Energy Efficiency Programme (SEEP) which will provide an offer of support to all buildings in Scotland – domestic and nondomestic – to improve their energy efficiency rating.

The Low Carbon Infrastructure Transition Programme (LCITP), launched in March 2015, with £76 million over the first 3 years, to provide tailored project development support for established and start-up infrastructure projects, including heat, across the private, public and community sectors.

And there is a support programme for local authorities to develop a strategic approach to district heating and supporting use of the Scotland Heat Map to do so.

Reducing Demand

The Scottish Government has implemented the Energy Efficiency Standard for Social Housing (EESH) which will mean that in the main social housing should be able to achieve an Energy Performance Certificate of 'C' or 'D' by 2020. Proposals are currently being developed for the

Regulation of Energy Efficiency in the Private Sector (REEPS). This will be consulted on in the summer of 2015.

Regulations requiring the assessment and improvement of the energy performance of existing non-domestic buildings will be laid in Parliament in 2015.

District Heating

£8 million has been committed to the District Heating Loan scheme between 2014 and 2016, bringing the total to over £11 million. A Special Working Group of the Expert Commission on District Heating will reports in summer 2015 on potential regulatory frameworks for district heating in Scotland.

The policy says a significant swing to electric heating could be counter-productive by triggering a requirement for additional electricity generating capacity at peak times which would probably have to be met by fossil-fuelled generation. But if instead off-peak surplus electricity is used to produce heat which can be stored this could have a beneficial effect on the grid. This could increase the capacity of renewable generation that can be accommodated onto the grid and maximise the use of existing grid assets before requiring more costly upgrades.

The National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP), published in June 2014, provide the national planning policy context for delivering heat networks.

Heat generation policies include:

- SG to fund feasibility studies on geothermal heat for district heating.

- SG to provide home renewables loans

- And press UK Government to extend RHI beyond 2015/16

Four illustrative scenarios using the SG's Heat Pathway Scenarios Model (HPSM) suggest that while the cost per kWh of heat is likely to increase in real terms between 2010 and 2050, there is significant potential to reduce the demand for fuels through the use of new technology, demand reduction and increased energy efficiency. By 2050 this action would mean that the total cost of energy for heating and hot water could be around 20% lower in real terms than in the 2010 base year.

Over 40 years between 2010 and 2050, heat equipment and energy efficiency improvements worth over £100 billion in today's prices will be replaced or installed.

SG has put in place a number of measures to support renewable heat generation, including significant project development and finance resource such as through the Low Carbon Infrastructure Transition Programme, Resource Efficient Scotland, the Community and Renewable Energy Scheme (CARES), the Local Energy Challenge Fund and Home Renewables Loan scheme to support the development of low carbon and renewable projects including heat, and to maximise investment in those projects.

Alongside the launch of the UK domestic Renewable Heat Incentive (RHI), the Home Renewables Loan scheme was boosted with a further £5 million in 2014/15 and a further £3 million this year. A

primary focus of the domestic RHI is to support homes off the gas grid, of particular benefit to the 22% of Scottish households that do not use gas as their primary heating fuel. In Scotland an estimated 84% of domestic RHI accreditations are from properties off the gas grid compared to 70% for GB as a whole.

Renewable Technologies

Those mentioned include:

- Heat recovery from sewers such as is planned for Borders College in Galashiels (See <http://www.scottishenergynews.com/borders-college-to-pioneer-4m-programme-of-scottish-sewage-heat-systems/>)
- Biomass preferably used in heat-only or good quality CHP and off the gas grid.
- Anaerobic Digestion providing bio-methane to the grid. The first such plant in Scotland, which came into production in December 2014, is at Couper Angus. (See <http://utilityweek.co.uk/news/first-scottish-gas-to-grid-ad-plant-set-for-construction/987882>)

In response to initial recommendations from the **Geothermal Energy** Expert Group SG has launched the £250,000 Geothermal Energy Challenge Fund calling for proposals for feasibility studies exploring the potential for geothermal energy to local community benefit,

Heat pumps and the potential for large scale applications either in conjunction with district heating and heat recovery, geothermal heat or using ambient heat. There are several schemes currently being assisted by the Heat Network Partnership which are also considering the use of larger scale water source heat pumps, in both urban and rural settings.

Gas-fired CHP

Gas CHP is common, for example in district heating schemes, and is likely to continue to have a role in both the short and medium term with benefits of newly installed gas CHP plant in reducing CO₂ being seen up to the middle of the 2020s. However the HPSM analysis indicates that to achieve the emission reductions required, district heating schemes will need to source a much higher proportion of heat from even more low carbon sources such as excess unused industrial heat, heat pumps and biomass. More recently hydrogen fuel cells have been developed which produce a greater proportion of power compared to heat.

The Scottish Government is working with SEPA, Resource Efficient Scotland, Scottish Enterprise and industry to identify sources of unused excess heat, assess their potential for recovery and help establish an evidence base for excess heat from Scottish industry.

Dr Dave Toke, reader in Energy Policy at Aberdeen University says if district heating systems are to be supplied by renewable energy then perhaps the most practical way of doing this is through the heat networks being supplied by industrial scale heat pumps. Renewable energy production from wind, solar, tidal etc needs to be expanded beyond the current size of the Government's 100 per cent electricity from renewables target to supply the decarbonised heat. It will be delivered by (probably water sourced) heat pumps which are an efficient way of using the renewable electricity.

The Scottish Government has already given £20 million in grants towards installing a district heating system supplied by a heat pump in Coal, Fort William. The Aberdeen Heat and Power Company has calculated that, using the renewable heat incentive (RHI) heat pumps are an even more economical means of supplying heat compared to gas engines. In the future they will certainly be lower carbon. (3)

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1. Utility Week 16th April 2015 <http://www.utilityweek.co.uk/news/scotland-risks-missing-2020-renewable-heat-targets/1122292>
 2. Reducing emissions in Scotland: 2015 Progress Report, Committee on Climate Change <http://www.theccc.org.uk/wp-content/uploads/2015/01/Scotland-report-v6-WEB.pdf>
 3. Dave Toke's Blog 12th June 2015 <http://realfeed-intariffs.blogspot.co.uk/2015/06/heat-pumps-and-district-heating-systems.html>

3 Geothermal Energy

The Scottish Government's Geothermal Energy Challenge Fund has awarded almost quarter of a million pounds to five feasibility projects to investigate how the thermal energy in the ground can be used to heat homes and businesses. A total of £234,000 has been awarded to projects targeting sites in Fife, West Lothian, North Lanarkshire and Aberdeenshire that will explore the technical feasibility, economic viability and environmental sustainability of the emerging technology.

The awards are the first support for geothermal projects in Scotland following a 2012-2013 study which identified significant potential for geothermal heat as a renewable heat source. Heat is estimated to account for over half of Scotland's total energy use and responsible for nearly half of Scotland's greenhouse gas emissions. The following projects are a potentially vital link in demonstrating how geothermal energy could cut the estimated £2.6 billion a year spent on heating by householders and the non-domestic sector. (1)

Guardbridge, Fife: to explore the geothermal potential under a brownfield site to provide heat to on-site industries and the local community; University of St Andrews Executive Director for Guardbridge. Other renewable energies are also being explored on the industrial site, which has previously housed a distillery and paper mill. The Guardbridge scheme aims to help St Andrews become the UK's first carbon-neutral university. (2)

Polkemmet, West Lothian: to establish the feasibility of geothermal heat from mineworkings, which will heat proposed new social housing in the area;

Hartwood, North Lanarkshire: to develop a fully operational minewater geothermal district heating system which could act as an exemplar of how to transform farm economics and transfer benefits to local communities

Hill of Banchory, Aberdeenshire: to explore the viability of adding geothermal energy from hot dry and hot wet rocks to the existing renewable heat network that is already serving the local communities.

Aberdeen Exhibition and Conference Centre: to conduct a feasibility study for the installation of a deep geothermal single well system to provide heat to the new Centre and associated buildings. The coalition of organisations working on this - including Geothermal Engineering Ltd, consultancy firm Arup, and St. Andrews University - hopes to open up a well within 12 months. (3)

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 2. Herald 21st June 2015 <http://www.heraldscotland.com/news/environment/hot-wet-rocks-could-help-heat-scotland-experts-claim.129598988>
 3. Business Green 18th June 2015 <http://www.businessgreen.com/bg/news/2413650/scottish-developers-to-investigate-geothermal-well-potential>

4 UK Government soldiers on with nuclear in the face of criticism from industry and the City

Scottish Energy Minister, Fergus Ewing has previously said subsidies for nuclear power will “inevitably” mean less financial support for green energy, and support for nuclear power is harming investment in renewable energy projects. (1) Now analysts and industry insiders are lining up to express doubts about the proposed £24.5bn Hinkley Point C nuclear power station branding it an “*expensive mistake*”, (2) and “*one of the worst deals ever*” for British consumers and industry. (3)

The chief executive of energy supplier RWE Npower Paul Massara said the “*expensive mistake*” could haunt our “children’s children”. The broadside comes as the government inches toward a deal with EDF Energy, the French nuclear giant, and two Chinese state energy companies, to finance and build two reactors at Hinkley. Massara has called for an “Office of Energy” to assess whether Hinkley and other big policy bets make sense given the changes sweeping through the energy industry, from the rapid fall in green energy costs to efficient homes and appliances that are reducing demand. Massara said: “These big central planning bets are likely to be the wrong answer.” British energy consumption, meanwhile, is falling by 1%-2% a year thanks to better insulation and more efficient white goods. Cables under the Channel open the possibility of a surge of cheap electricity from the Continent. Amid those changes, making a half-century bet on a single plant looks questionable. Massara added: “*We must allow innovation and new technology to find its way.*” (4)

Massara argues that “[t]he energy industry in 10 years is going to look very, very different because of the pace of technological change.” He reckons that within three years, solar power will not need any support to be competitive. Peter Atherton, an analyst at Jefferies, reckons that “*the UK now seems to be where Germany was in 2011 - when the share of wind and solar generation crossed the critical 10% level in 2014*”. The British market has already had moments when prices have dipped into negative territory. Atherton said: “*While expected, these effects are perhaps happening several years earlier than many anticipated.*” (5)

Lord Howell of Guildford - a former Tory energy secretary, and Chancellor George Osborne's father-in-law - described the "*elephantine*" Hinkley C nuclear project in Somerset as "*one of the worst deals ever*" for British consumers and industry. He told peers he would "*shed no tears*" if the multi-billion pound development was abandoned. (6)

Secretary of State for Energy and Climate Change told the House of Commons Select Committee before the recess that there is a "*very good prospect*" of an investment decision on Hinkley finally being taken later this year, and it is "essential" that the project goes ahead. (7) She said the high strike price offered to Hinkley was worth it because we need a secure baseload to back up "*unreliable renewables*" as part of the energy mix "*until we get storage right*". (8) EDF takes a similar line saying we cannot rely on intermittent renewables or the vague promise of innovation - with plants still needed for times when the wind doesn't blow and the sun doesn't shine, "*nuclear remains competitive with any other technology*".

But Peter Atherton, energy analyst at investment bank Jefferies, told *The Guardian* that for the same price as Hinkley Point, which will provide 3,200 megawatts of capacity, almost 50,000 megawatts of gas-fired power capacity could be built – enough to "*effectively replace the entire thermal generation fleet in the UK*". (9)

In July HSBC published a 60-page report focusing on several factors, from falling energy demand to soaring imports that provide "*ample reason for the UK government to delay or cancel the project*". HSBC forecasts that interconnection capacity will more than double to 7.4GW by 2020 - equivalent to roughly 1.3 Hinkleys - at a fraction of the cost. The bank wrote: "*There is every reason to believe that the UK will become a very substantial net importer.*" HSBC warns the cost of the agreed price support will rise if wholesale electricity prices remain low and UK energy demand will continue to fall. (10)

A proposal for Norway to use its 93 hydroelectric power plants to store up to 20 GW of electricity has been put forward. If the ambitious scheme can overcome political and social hurdles and get the necessary funding it could all be achieved in seven years – a year before Hinkley is expected to come on stream. The recently announced 1,400-megawatt NSN Link will join the U.K. to Norway, cost €1.5 billion (\$1.64 billion), and, at 740 kilometers, will be the longest HVDC interconnector in the world. It's hoped it will be operational in 2021. (11)

The EU energy commissioner says European funds could be used to help build a "supergrid" across the North Sea. Commissioner Miguel Arias Canete has told the Scottish Tory MEP Ian Duncan, a member of the European Parliament's energy committee, that the building of the grid - which would be the world's largest sub-sea electricity system - is now a "top priority" for the European Commission and that "*it was now for member states and devolved administrations to work with the EU to make the grid a reality*".

The Commission has now announced a consultation on its plans for an EU-wide energy union which aims to create a single European market for energy supplies, purchases and consumption in an attempt to loosen Russia's grip on Europe's energy needs. The Netherlands, which takes over the revolving six-month presidency of the EU in January, has said that the grid project would be one of its presidency priorities. A North Sea grid would allow green energy produced in Scotland to be stored in Scandinavian pump storage hydro schemes until demand peaked elsewhere in Europe. (12)

EDF is desperately fighting back. And the Chinese appear to be planning to come to the financial rescue. China's President, Xi Jinping, is due in London in October and is expected to agree with David Cameron, the UK's Prime Minister, to fund the deal. The Chinese generosity in helping out is because they will gain an important toehold in Europe, and hope to build their own nuclear reactors on British soil – probably at Bradwell. (13) The Ecologist website says although there might well be signatures on a piece of paper in October the smart money says Hinkley C never get built. (14)

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5 Sustainable Energy Strategies under Attack

Since the General Election the Secretary of State for Climate and Energy, Amber Rudd, has overseen a string of attacks on green policies. (1) Recent measures announced include:

- Subsidies for new onshore wind farms to end on the grounds that the technology should stand on its own feet and save bill payers money. Ironically onshore wind has attracted a lot of investment and can be the most cost-efficient way of producing low carbon energy.
- The early closure of the renewable obligation (RO) subsidy for solar a year early in April 2016 for schemes of less than five megawatts (subject to consultation).
- A review of the feed-in tariff, to make further significant savings in a move that could threaten state support for solar panels on domestic roof tops. The Government admitted the benefit of scrapping support for the solar industry at this stage would only save energy consumers 50p a year.
- The Government is consulting on ending feed-in tariff (FiT) pre-accreditation for small to mid-sized renewables projects. This would hit community projects particularly hard by making it much more difficult to obtain finance. (You would have to install the renewable system before applying for the feed-in tariff, so investors would be taking a risk on not receiving the subsidy).
- The government also confirmed that it was removing the guaranteed level of RO subsidy for coal or other fossil fuelled-power stations which are converting to wood or another biomass fuel.
- The Government has effectively killed the Green Deal. Few will mourn the scheme, but what's striking is Rudd has nothing to replace it with. So, apart from poorer households, who get support through the separate ECO scheme, there is now no serious energy efficiency policy for homes, which account for around a third of UK carbon emissions. A review of all remaining energy efficiency schemes is currently underway with details expected in the autumn budget.
- The Government is selling off as much as 70% of the Green Investment Bank, which was launched in 2012 to help green projects with an initial injection of £3.8bn of public money.
- Giving up on zero carbon homes: A decade-long plan to force all new homes to be 'zero carbon' from 2016 was binned by the Treasury. Major housing developers said the decision was "extremely disappointing", a view that was echoed by planners, green groups and the designer of a new 'carbon positive' house that just opened in Wales. (2)
- Removal of the Climate Change Level Exemption for Renewable Energy. This imposes retrospective cuts on renewable projects already up and running across the entire clean energy sector. (3)

Ending the Renewable Obligation Certificate subsidy to onshore wind a year early will have a disproportionate effect in Scotland. 70 per cent of UK onshore wind projects and the 10,000 jobs now threatened are located in Scotland. Some companies have already invested millions of pounds in projects that would have created jobs, helped to secure Scotland's energy future and hit carbon reduction targets. According to Scottish Renewables, about 850 Scottish onshore wind turbines spread across 37 projects (representing 2,129 MW of generation capacity) already have planning permission and are now under threat.(4) The decision has caused an outcry in Scotland, with industry experts claiming £3 billion of investment could be lost and 3,000 jobs put at risk.(5).

Rudd told the House of Commons Energy and Climate Change Committee that carbon reduction targets are a bigger priority than renewables, (6) which basically means she is leaving the door open to missing the UK's European Union Renewable Target of meeting 15% of our energy (not just

electricity) needs from renewable sources by 2020. (7) Instead she will try to meet the UK's carbon reduction commitments with nuclear power and by replacing coal with fracked gas.

In her first major speech as Energy and Climate Change Secretary Rudd defended the cuts to renewable energy subsidies. She said that the Government's approach will keep consumer bills down and encourage businesses to innovate, grow and create employment. Unchecked climate change is a threat to growth, quality of life and the economy as a whole, but the best way to deliver a low carbon economy is by using free markets and competition, to help develop new green technologies, make them cheaper, and show other businesses the benefits of a low carbon economy. (8)

The problem is this is simply all talk, said the *Scottish Herald's* Editorial. There is no evidence that the rhetoric will be backed up by policy. (9) Rudd's competition solution is to subsidise the technologies that are more expensive and undermine the technologies that have used subsidies to reduce their costs to the bill payers. It makes no sense to be pulling the rug from under the very technologies – onshore wind and solar - which can deliver both lower bills and energy security in the long term. (10)

Rudd says “*we need to reduce our emissions in the most cost-effective way*”. Yet the government support package for Hinkley C has been independently costed at £76 billion (€108 billion). (11) More than 40% of DECC's budget is already spent on nuclear waste management, and yet this technology, which will take years to make a material difference to our energy security, remains favoured by government while renewable technologies that could deliver more quickly and cleanly are being undermined. (12)

Energy Policy in Chaos

The problem is that nobody knows yet what measures, if any, the Government plans to implement to replace the measures scrapped. The Committee on Climate Change (CCC) says if the government chooses to try meeting its legally binding carbon targets without onshore wind, for example, it must explain why it is taking a more expensive route towards decarbonisation. In any case virtually all low-carbon measures are due to expire before 2020 so the Government needs to say what will replace them. (13) Under the Climate Change Act, ministers must respond to the committee by mid-October and set out how it will meet the shortfall in renewable energy generation after the withdrawal of support for onshore wind. (14)

One of the most urgent measures which needs to be updated next year is the Levy Control Framework (LCF), which places a limit on the amount of money which can be raised from consumers' bills for energy subsidies. The Renewable Heat Incentive, which offers payments to homeowners and business installing green heat technology, also needs to be extended from April 2016 to at least 2020 unless a suitable replacement can be found. The Energy Company Obligation (ECO) scheme should also be extended beyond 2017. (15)

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6 The Tory UK Nuclear Future

Andrea Leadsom, Minister of State for Energy and Climate Change, told the House of Commons that the Government hopes to be able to meet 35% of the UK's electricity requirements from nuclear by 2028. (1) To do that all of the currently proposed reactors (about 15.2GW) would have to proceed without too many delays and then would have to operate at a rather unlikely 90% capacity factor (the amount the plant generates compared to the amount that would be generated if it was operating at full power all of the time). A nuclear plant operating with a capacity factor of only 45% would need twice the power price to be an economic proposition compared with one which operates at 90%



There are four EPR reactors being built in the world – similar to the ones proposed for Hinkley in Somerset and Sizewell in Suffolk. Olkiluoto-3 in Finland is nine years late and €5.5 billion over-budget. Flamanville-3 is five years late and €5.3 billion over-budget. Taishan-1 & -2 in China are both two years late - but no reliable cost information has been published. (2)

The AP1000 reactors – like the ones proposed for Moorside near Sellafield - are having the same problems. Two being built in China are 18–36 months late. Two being built in Georgia (USA) are around 3 to 4 years late and around \$3bn over-budget. Another two being built in South Carolina are between two and three years late, and \$1.2bn over-budget. (3)

The Advanced Boiling Water Reactor (ABWR) type proposed for Wylfa on Anglesey and Oldbury in Gloucestershire is presented as the only reactor type which has operational experience. But none of the reactors already built, all of which are in Japan, have a capacity factor above 73% and two have capacity factors of less than 40%. (4)

On top of the initial 15.2GW of nuclear reactors proposed the Government appears to be planning to hand over the Bradwell, site in Essex, “lock, stock and barrel” to the Chinese National Nuclear Corporation. (5) In addition the Government is supporting research into Small Modular Reactors (SMRs) which could be fabricated in a factory and transported to a reactor site. Penultimate Power, based in Newcastle, was formed by long-standing nuclear power advocate Ian Fells, emeritus professor of energy at Newcastle University, now wants to develop a manufacturing plant in the region and trial the world’s first SMR on land next to the existing Hartlepool (AGR) nuclear power plant in County Durham. (6) A feasibility study by the National Nuclear Laboratory, published in December 2014, estimated that around 7 GW of SMRs could be built in the UK by 2035. (7) There is already a provisionally agreed schedule to begin a Generic Design Assessment (GDA) for an SMR in 2017. Trawsfynydd in North Wales – the site of a decommissioned Magnox reactor, has also been suggested as a site for an SMR. (8)

Even that doesn’t complete the picture, because the Nuclear Decommissioning Authority (NDA) appears to focussing its efforts in dealing with the UK’s embarrassing plutonium stockpile on evaluating two different reactor projects – the GE Hitachi PRISM reactor and the Candu Energy Canmox project with the latter reported in June as the front-runner. Ontario-based Candu Energy is proposing to turn plutonium into mixed oxide (MOX) pellets at a dedicated fabrication facility at Sellafield. The MOX fuel could then be used in four thermal reactors to produce up to 3GWe of electricity. Canmox claims to be able to deal with the entire stockpile of plutonium, regardless of the grade or contamination. (9)

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 2. World Nuclear Industry Status Report 2015 <http://www.worldnuclearreport.org/IMG/pdf/20150725MSC-WNISR2015-v2-LR.pdf>
 3. Carbon Commentary 16th July 2015 <http://www.carboncommentary.com/blog/2015/7/16/alternatives-to-the-unconstructible-epr-may-be-almost-as-bad>



4. David Toke's Green Energy Blog 30th October 2012 <http://realfeed-intariffs.blogspot.co.uk/2012/10/hitachi-bid-more-fantasy-nuclear-power.htm> |
5. Essex Chronicle 18th June 2015 <http://www.essexchronicle.co.uk/Nuclear-plan-blight-Bradwell-s-community-200/story-26715329-detail/story.html>
6. The Journal 9th July 2015 <http://www.thejournal.co.uk/business/newcastle-company-head-push-create-9612055>
7. Small Modular Reactors Feasibility Study, National Nuclear Laboratory, December 2014 <http://www.nnl.co.uk/media/1627/smr-feasibility-study-december-2014.pdf> (see also World Nuclear News 4th Dec 2014 <http://www.world-nuclear-news.org/NN-National-Nuclear-Laboratory-urges-UKinvestment-in-SMRs-4121401.html>)
8. BBC 16th July 2015 <http://www.bbc.co.uk/news/uk-wales-north-west-wales-33546634>
9. Professional Engineer 30th June 2015 <http://www.imeche.org/news/engineering/uk-canada-deal-for-radical-nuclear-waste-solution>

7 Dounreay News

11 tonnes of "breeder" material has now been transported from Dounreay to Sellafield for reprocessing in 32 shipments which began in December 2012. A further 33 tonnes of material still inside the Dounreay Fast Reactor will also eventually be moved to Sellafield. (1) The breeder material consists of rods of natural uranium that had been placed around the core of the Dounreay Fast Reactor (DFR) to produce plutonium, so transporting the material by rail poses a security threat.

The 11 tonne payload was taken in batches by lorry from Dounreay to a specially constructed railhead at Georgemas where it was loaded onto trains operated by DRS, the national nuclear freight operator. The breeder fuel had been kept in secure stores at Dounreay following the closure of the Dounreay Fast Reactor in 1977. The material had originally been earmarked to remain at Dounreay but in 2011, the UK government opted to move the fuel for reprocessing at Sellafield. (2)

The remaining 33 tonnes of breeder material is scheduled to be sent to Sellafield in a second phase of transports. Purpose-built retrieval equipment has been installed above the reactor and is currently undergoing testing. Transfer of the remaining breeder material to Sellafield is expected to be completed around the end of 2017 and will involve a further 60 or so transports. (3)

Shaft and Silo

Meanwhile M+W Group – a German engineering conglomerate – has been appointed as the lead design and safety case consultant for the Dounreay nuclear waste shaft and silo decommissioning project by Dounreay Site Restoration Limited (DSRL). Used for over 40 years to store highly radioactive waste generated during the operation of Dounreay, the 65 metre deep shaft is the deepest storage area of its kind in the world. It has become a byword for sloppy safety practices and nuclear safety scares. Decommissioning both the shaft and silo – including safe retrieval of the waste from both these facilities, its repackaging and the clean-up – will present a number of unique and major technical and engineering challenges over the term of the seven-year contract. (4)



Vulcan

The nuclear submarine test reactor at Dounreay has been shut. The facility at the Vulcan Naval Reactor Test Establishment will now be fully decommissioned over the next seven years. Most of the 300 people who work on the site, run by Rolls-Royce, will not lose their jobs as they will work on the clean-up. The reactor was the focus of a political row after the government revealed last year that low levels of radioactivity had been found in its cooling waters. Ministers said no leak had occurred and there were no safety implications for staff or risks to the environment. As a result, HMS Vanguard, a Trident submarine, had to be refuelled with a new core at a cost of £120 million. The problem was found in 2012 but not made public until 2014. The SNP demanded an apology from the government for not making Holyrood aware of the problem. The decision to close the reactor, announced in 2011, was not connected with the matter. (5)

Sodium Tanks

The Prototype Fast Reactor (PFR) team has now received regulatory permission to restart operational work in the sodium tank farm. DSRL submitted a report to the ONR detailing the corrective actions it took to resolve the ONR improvement notice measures resulting from the investigation into the fire that occurred back in October 2014. (6)

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 2. John O Groat Journal 29th May 2015 <http://www.johnogroat-journal.co.uk/News/DFR-breeder-fuel-stockpile-shrinks-29052015.htm>
 3. World Nuclear News 29th May 2015 <http://www.world-nuclear-news.org/WR-Dounreay-completes-first-phase-of-breeder-shipments-2905155.html>
 4. Scottish Energy News 11th June 2015 <http://www.scottishenergynews.com/german-nuclear-engineers-appointed-for-dounreay-atomic-waste-dump-decommissioning/>
 5. Times 23rd July 2015 <http://www.thetimes.co.uk/tto/news/uk/scotland/article4506086.ece>
 6. DSRL 6th July 2015 <http://www.dounreay.com/news/2015-07-02/pfr-tank-farm-work-restarts>

8 Hunterston

Hunterston B-7 nuclear reactor was shut down in June due to high levels of seaweed. The station's second unit continued to operate at a reduced load.

Torness has been shut on several occasions because of blockages caused by biological material. But this is the first time it has been reported at Hunterston, Both reactors at Torness had to be shut in June 2011 for two days because jellyfish were obstructing the cooling water intake. (2) And both reactors were shut for three and a half days because of seaweed in May 2013 (3) Reactor 2 at Torness had to be taken offline a second time in November 2013 because of seaweed. (4)

Meanwhile between 40 and 50 jobs are to be axed at Hunterston A out of a total workforce of 240, as part of a restructuring of Magnox Ltd. The Company said it was setting out plans to reduce workforce numbers across the whole UK by about 1500 over the next 17 months. Magnox Limited's parent companies are now Cavendish Nuclear and Fluor Corporation. (5)

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1. BBC 2nd June 2015 <http://www.bbc.co.uk/news/uk-scotland-glasgow-west-32970794>
 2. East Lothian Courier 7th July 2011 <http://www.eastlothiancourier.com/news/dunbar/articles/2011/07/07/415049-fishermen-cleared-torness-of-jellyfish/>
 3. Utility Week 29th May 2013 <http://utilityweek.co.uk/news/Torness-nuclear-power-plant-back-from-seaweed-shutdown/892782>
 4. Guardian 21st November 2013 <http://www.theguardian.com/environment/2013/nov/21/seaweed-torness-nuclear-reactor-east-lothian>
 5. Ardrossan Herald 27th May 2015 <http://www.ardrossanherald.com/news/news-roundup/articles/2015/05/27/867880-up-to-50-jobs-to-go-at-hunterston-a/>

9 Torness

Torness started generating in 1988. Its reactors were originally designed to last 30 years, but their currently scheduled closure date is now 2023 when they will be 35 years old. On 19th March 2015, at this year's Torness Local Liaison Committee meeting, it was announced that EDF Energy had already started the process of applying for a further life extension and the Office for Nuclear Regulation (ONR) is expected to give its permission.

Reactor Two was taken out of service in July for a rigorous inspection and refurbishment. More than 500 extra workers will join the existing 750-strong workforce on the site. The £30 million refurbishment is expected to last nine weeks and the works include the installation of new equipment at the plant - changing two gas circulators which help cool the reactor and replace blades on the turbine which turns steam into electricity.

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10 Submarines

Storing and maintaining Britain's 19 laid-up nuclear submarines has cost taxpayers nearly £16m over the last five years. The out-of-service vessels have been stored at Rosyth in Fife since 1980 and

Devonport in Plymouth since 1994. A Freedom of Information request to the MoD by the BBC revealed the combined cost of preventing any nuclear materials on board getting into the environment from the seven submarines at Rosyth and 12 in Devonport. In 2013/14 it cost £1.6m to store and maintain 7 subs at Rosyth and £1.8m for 12 at Devonport. (1)

The MOD documents said that the "cost to the tax-payer of maintaining the submarines safely is rising significantly as they age and as more submarines leave service. (2)

Work to dismantle the subs has been postponed until a site for temporary storage of their radioactive reactors can be found. A decision on a site is expected later this year after public consultation finished in February. A test dismantling of a submarine at Rosyth is due to start in January next year, according to the MoD. (3)

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1. BBC 3rd June 2015 <http://www.bbc.co.uk/news/uk-england-devon-32086030>
 2. Times 4th June 2015 <http://www.thetimes.co.uk/tto/news/uk/scotland/article4460072.ece>
 3. Herald 3rd June 2015 <http://www.heraldscotland.com/news/home-news/disused-nuclear-submarines-cost-taxpayer-16-million.127897176>

11 Floating Turbines

Floating wind turbines could provide the "next big opportunity" for Scotland's burgeoning renewables industry, according to Scottish Energy Minister Fergus Ewing. A major new report from the Carbon Trust investigates the feasibility of the technology and concludes it could play a crucial role in pushing down the cost of offshore wind technologies.

The report argues high winds make Scotland particularly well suited to offshore wind technology, but with the number of shallow near-shore sites required for traditional offshore wind farms decreasing, continued expansion of wind energy will require deeper water sites to be explored. Advocates of floating turbines argue they are well suited for deeper water sites and the report predicts that with significant development the technology could result in lower costs. It calculates the operational costs of floating wind farms could be as low as £85 per MWh, well below the £100 per MWh target the offshore wind industry is committed to delivering by 2020. (1)

"One of our hypotheses is that floating wind can actually develop quicker if Scotland does take a leading role," said Carbon Trust analyst and lead author Rhodri James. *"Scotland could very much be at the front of that - it could help commercialise the technology, which will open up opportunities around the world to export that expertise and products as well."* Floating turbines can be used in waters that are too deep for bottom-mounted towers. But despite having the highest fixed offshore wind capacity, the UK currently has no floating wind turbines installed. However, there are three demonstration projects in the pipeline, all in Scotland. Construction is set to begin on the first, off the coast of Peterhead, next year. (2) The five 6MW turbine scheme is due for completion in 2017 and could become the world's first floating wind farm. Norway's oil and gas firm Statoil plans will

take the final investment decision on this in September. Two more pilot schemes, near Kincardine and Dounreay, are planned for 2018. (3)

Meanwhile the French Government has joined the race and launched a tender asking for companies to submit plans for a floating wind farm. France's environment agency ADEME is calling for projects between three to six turbines, with the capacity for at least five megawatts per turbine. Portugal and Norway have both built single floating turbines, but it is thought the French project will be the first to test the technology at scale. Earlier this month, a 7MW floating turbine was installed in Japan, becoming the largest such turbine yet built. (4)

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1. Business Green 24th June 2015 <http://www.businessgreen.com/bg/news/2414508/scotland-can-take-the-lead-in-commercialising-floating-wind-farms-report-says>
 2. Scotsman 25th June 2015 <http://www.scotsman.com/news/environment/scotland-could-be-floating-wind-energy-leader-1-3811698>
 3. Reuters 7th July 2015 <http://news.yahoo.com/statoil-decide-scottish-floating-wind-farm-september-154951323--sector.html>
 4. Edie 10th Aug 2015 <http://www.edie.net/news/6/France-sets-sights-on-first-ever-floating-windfarm/>

12 Zero Carbon Homes

Experts from industry and universities are urging the First Minister, Nicola Sturgeon, to reject UK Government moves to abandon plans for zero-carbon homes. Last month, Chancellor George Osborne slipped out a surprise announcement that he was dropping a previous commitment that all new homes built from 2016 would meet zero-carbon targets. His aim was to "reduce regulation" for builders, but it is likely to result in new houses with less insulation and more wasted energy. Osborne's move prompted a howl of protest from UK businesses. In a joint letter, they argued that the sudden policy U-turn would inhibit investment, be "regressive" and "harmful to British industry".

Now 20 academics, business leaders and professionals have signed an open letter to Sturgeon urging her to take a very different approach. "*Work with us to develop new policies to ensure the wide-ranging impacts of the disastrous decisions now being made at Westminster will not be felt by the people of Scotland,*" the letter says. "*Improving the condition and energy efficiency of the Scottish housing stock will be essential in meeting many of our environmental, social and economic objectives towards 2030 and 2050. Removing the current targets, or letting them slip further, will add to our legacy of sub-standard housing that is not fit for a world in which all homes will need to be zero-carbon homes.*"

According to the local government minister, Marco Biagi, the Scottish Government introduced "*more demanding*" energy standards that will come into force in October. "*We remain committed to all new buildings being nearly zero energy from 2019, in line with European Union (EU) requirements,*" he told The National. Future reviews will investigate if further reductions in carbon dioxide emissions, advocated in the 2013 Sullivan Report Update" (1)

Meanwhile a new four-bedroom house in North Yorkshire is able to generate more than 13,000 kWh of electricity and heat a year. It will use 5,000 kWh itself whilst the remaining 8,000 kWh will be exported to the grid - enough electricity to run two further houses. (2)

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1. The National 11th Aug 2015 <http://www.robedwards.com/2015/08/call-from-experts-to-back-low-pollution-homes.html>
 2. Edie 12th August 2015 <http://www.edie.net/news/6/This-house-can-power-itself-and-two-other-homes/>

13 Local Energy

A campaign is under way in West Lothian to make Linlithgow self-sufficient in renewable energy. Linlithgow Natural Grid (LNG) has been examining how it could be done using a combination of solar and wind power, along with the innovative "Heat from the Street" project, which has received £25,000 of funding from the Local Energy Challenge Fund. This would capture heat from waste water flowing beneath the streets of the town, using heat pumps powered by solar electricity. An energy corridor would be created through the town by linking this mini power station with a mini district heat network, serving a cluster of public buildings. At its heart is a sewage heat recovery system from Sharc Energy Systems that captures heat from the millions of gallons of household waste water making its way to the treatment plant. The project aims to install community solar panels on blocks of Linlithgow flats and, instead of selling the production on the cheap, use it to power heat pumps to take the heat from waste water to meet sources of high local demand, particularly in public and church buildings.

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1. The National 1st August 2015 <http://www.thenational.scot/news/green-power-plan-to-take-linlithgow-off-the-national-grid.5840>

14 Methil

A £100 million vision for an offshore wind turbine factory in Methil which was expected to bring hundreds of jobs to the area has been left in tatters after engineering giant Samsung Heavy Industries (SHI) axed plans for a turbine manufacturing plant. (1)

On a more positive note an innovative green hydrogen project in Levenmouth has marked a major milestone after Fife Council awarded a contract worth around £1.5million for the supply of nine 'green' refuse-collection lorries. Two of the vehicles are to be converted to run on diesel and hydrogen which is believed to be a world-first of their kind. They will also become part of Levenmouth Community Energy Project, a pioneering development that aims to position the region as a global leader in clean energy through developing the Hydrogen Office in Methil into a world-class demonstrator of hydrogen applications generated from renewable sources. (2)



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