

# SAFE ENERGY E-JOURNAL No.78

June 2018

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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/wp/wp-content/uploads/2018/05/NuclearNewsNo107.pdf>

## 1 Scottish Climate Change Bill

Scotland will become one of the first countries to achieve a 100% reduction in carbon emissions, according to Climate Change Secretary Roseanna Cunningham. The new Climate Change Bill will immediately set a target of a 90% reduction by 2050, which the UK Committee on Climate Change (UK CCC) says is currently *"at the limit of feasibility."* The draft Bill sets out the Scottish Government's intention to achieve a 100% reduction - 'net-zero' - as soon as possible. Ministers will be legally required to keep the net-zero target date under review by seeking expert advice on the issue every five years. The target date will become legally-binding, subject to the consent of the Scottish Parliament, as soon as there is sufficient evidence to demonstrate the date is credible and achievable. As well as increasing long term ambition, the new Bill also includes the most ambitious interim targets in the world, as well as stretching annual targets for every year between now and 2050. This means action will need to increase immediately, across every sector of the Scottish economy. It will also require action by individuals, communities and businesses. (1)

Tom Ballantine, Chair of Stop Climate Chaos Scotland described the draft Bill as *"hugely disappointing ... the Scottish Government has failed to live up to its own rhetoric on global climate change leadership, by failing to set a net zero emissions target in the Climate Change Bill."*

The coalition of environmental groups said the *"Scottish Government has disregarded the voices of over 19,000 people in Scotland who asked for a net zero target by 2050 at the latest, as well as the voices of eminent global scientists, members of the farming community, faith leaders and those at the front line of climate change impacts around the world. As it stands, this Bill does not deliver on the Paris Agreement, and it does not deliver climate justice to those who already feeling the devastating impacts of climate change."* (2)

The new target will be tougher than the previous legally binding goal of reducing greenhouse gas emissions by 80% by 2050 compared with 1990. The UK government's current target is also to cut emissions by 80%. The Scottish government said it would have a new interim target for 2020 of a 56% cut compared with the existing goal of 42%. (3)

The Scottish Greens called the new aim "timid" saying it would actually see a slowdown in progress towards climate goals. They say zero emissions should be achieved by 2040. (4)

Six countries – France, Sweden, Catalonia, Costa Rica, Iceland, New Zealand - have recently committed to zero emissions by 2050 or sooner, while communities from all over the world call on Scotland to toughen its climate pollution targets. (5)

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1. Scottish Government 24<sup>th</sup> May 2018 <https://news.gov.scot/news/commitment-to-net-zero-greenhouse-gas-emissions>
  2. Stop Climate Chaos 24<sup>th</sup> May 2018 <https://foe.scot/press-release/scottish-governments-climate-change-bill-hugely-disappointing/>
  3. FT 24<sup>th</sup> May 2018 <https://www.ft.com/content/e194abf6-5f57-11e8-9334-2218e7146b04>
  4. Scotsman 25<sup>th</sup> May 2018 <https://www.scotsman.com/news/environment/new-climate-change-laws-are-timid-and-hugely-disappointing-1-4744709>
  5. The National 5th April 2018  
[http://www.thenational.scot/news/16137829.LIST\\_\\_The\\_countries\\_working\\_towards\\_zero\\_climate\\_pollution/](http://www.thenational.scot/news/16137829.LIST__The_countries_working_towards_zero_climate_pollution/)

## 2 Scottish Energy Company

Scottish ministers are weighing options for setting up a new state-owned energy company following the publication of a report by the EY Consultancy. One of the options is for a national provider to sell electricity and gas through local councils. The report estimated the cost of setting up the company could be up to £3.5m, with first year running costs at £9m. It warned there is already tough competition on price, with 42 rival companies in the Scottish market.

EY also highlighted the risk to the Scottish government of making a loss. Of those 42 firms, half reported a loss in their most recent accounts, including two of the so-called "Big Six". More than half of them highlight their competitive prices in trying to attract customers. Yet the market still fails to operate properly because so many people fail to consider switching providers to get a better deal. EY sets out the possibility of operating under a "white label" company. As happens in some cases already, energy suppliers operate through trusted brands. But as such a brand, the Scottish government would lack control of prices. It is seen as being able to focus instead on boosting more efficient use of energy, to reduce the amount used in households where people struggle to afford adequate heating and fuel. (1)

Dave Toke, reader in Energy Politics at Aberdeen University, says the EY report gives little hope that the Company will give a substantial boost to renewable energy. Hopes that such a company would be able to open the doors to the many possibilities for cheap onshore wind and solar farms in Scotland are likely to be dashed if the company is formed following the priorities set down in the report. The idea of 'increasing the proportion of energy from renewable sources' is relegated to

'phase two' of the agenda. In political terms this means that whilst there may be a lot of advertising focus on how the company gets its energy from renewable energy sources, in reality little or no new energy will be sourced from new renewable energy projects - that is unless they would have been started anyway as a result of programmes funded by Westminster. (2)

The report sets out several options, including taking over an existing socially motivated supplier; creating a central supply company and using councils to deliver energy; and the creation of a fully-fledged Scottish government company to supply and deliver energy. They said a new energy company could be well positioned to attract customers if it could provide competitive pricing. If successful, it could also encourage greater energy efficiency and support sustainable economic growth. (3)

Former Labour Energy Minister, Brian Wilson said *“the Scottish Government has fed £315,000 into the ample coffers of EY to tell them what less expensive sources of information could have advised many months ago – that this is a lot more “challenging” than it sounds.”*

He continues: *“The word “challenging” crops up a lot in the EY report. It is a real “Yes, Minister” turn of phrase which translates roughly as: This is really not a good idea but that is not what we are being paid to tell you. So just be careful and don’t blame us”*. As work by Strathclyde University’s Energy Policy Centre has shown, energy efficiency measures are likely to be more effective in fighting fuel poverty than cheaper tariffs, particularly when many who could benefit from existing competition options resolutely decline to do so. (4)

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1. BBC 9th April 2018 <http://www.bbc.co.uk/news/uk-scotland-scotland-business-43692159>
  2. Dave Toke’s Blog 9<sup>th</sup> April 2018 <http://realfeed-intariffs.blogspot.co.uk/2018/04/report-implies-that-proposed-scottish.html>
  3. Times 10<sup>th</sup> April 2018 <https://www.thetimes.co.uk/edition/scotland/state-energy-company-would-struggle-to-compete-on-prices-lmzlb7qvk>
  4. Energy Voice 30<sup>th</sup> April 2018 <https://www.energyvoice.com/opinion/169664/scottish-government-approaching-fuel-poverty-question-from-wrong-direction/>

### 3 Hunterston B

THE prolonged closure of reactor 3 at Hunterston B in North Ayrshire is the beginning of the end for seven nuclear power stations in Scotland and England. The reactor is scheduled to stay offline until 17<sup>th</sup> November according to EDF’s website, but experts doubt whether it will ever restart, and argue that proliferating cracks in other elderly reactors across the country will shorten their expected lives and lead to premature shutdowns. EDF Energy, however, insist that it will be able to reopen the reactor.

Independent nuclear engineer John Large says extending the life of troubled reactors like the one at Hunterston is *“gambling with public safety”*. He says the new cracks signal the *“death knell”* for

Hunterston reactor three. *"This means that reactor four is doomed to the same fate, followed by similar plants at Hinkley Point and Hartlepool, thereafter progressively followed by other advanced gas-cooled reactors"*.

EDF says it has found a total of 39 "keyway root cracks" in the reactor and they are *"happening at a slightly higher rate than modelled"*. The integrity of the thousands of graphite blocks that make up the reactor core is vital to nuclear safety. They ensure that the reactor can be cooled and safely shut down in an emergency. Large argues that EDF's decision to keep reactor three closed until the end of the year was prompted by the UK Government's safety watchdog, the Office for Nuclear Regulation (ONR). *"ONR's doubts about the reactor safety have not been satisfied by this most recent inspection,"* he said. *"It may simply be a way of saving face and fobbing off the announcement that the plant is to be permanently shut down."*

Large also highlighted the uncertainties in tracking cracks, which are mostly modelled rather than measured. *"There is little that EDF can do to physically resolve this problem,"* he said.

Rita Holmes, a local resident who chairs the Hunterston site stakeholder group, argued it would be very difficult for the public to have confidence in the safety of reactor three. *"It has had its day and should be allowed to bow out gracefully,"* she said. (1) *"The local communities are unhappy that the reactor has any cracks, and certainly not happy that one with a growing number of cracks could be allowed to continue generation."*

If the graphite blocks fail and become misshapen, nuclear fuel could get stuck overheat, melt down and leak radioactivity in a major accident. Cracks could also prevent control rods from being inserted causing the nuclear fuel to overheat, potentially resulting in a nuclear accident. An ONR spokesperson said: *"Before we grant permission to EDF to restart reactor three we will require that an adequate safety case justifying further operation."* John Large said *"The core at Hunterston may now be in such a poor structural state that its collapse during a relatively modest earthquake could result in a nuclear fuel meltdown and significant radioactive release."*

EDF says *"We have prepared well for this; we have a £100 million graphite research programme."* Professor Paul Bowen, a metallurgist from the University of Birmingham who advises the ONR, thought that the body was likely to insist on more frequent inspections rather than reactor closure. *"I'm absolutely confident that the regulator will take a very conservative position,"* he said. (2)

*"The thing which will close (these reactors) down in the end will be the cost of ensuring safety. It is possible to make a safety case for a significant amount of cracked bricks but it takes time and costs money,"* said Barry Marsden, professor of nuclear graphite technology at the University of Manchester. (3)

Local communities should be given a say in the future of Hunterston, according to Green MSP Ross Greer. He says the lack of public consultation has been unacceptable, while highlighting that European law says all ageing nuclear power stations should have an environmental impact assessment. He said: *"This is obviously of major safety and economic concern to the local community. Last year I published a report urging the Scottish Government to review safety conditions at the site following earlier reports of cracks and the repeated granting of lifetime extensions to the plant. The*

*local community currently has no say in decisions to extend a plant's lifetime as an Environmental Impact Assessment with a public consultation is not required. The government must reconsider its position on the need for an Environmental Impact Assessment to accompany decisions on the granting of lifetime extensions to ageing nuclear power stations and commit to a renewed transition plan for North Ayrshire which will prevent the community being left behind, as so many others have been, by the closure of aging power stations."* (4)

A Committee of the Aarhus has just published a report which says the Netherlands "failed to comply" with Aarhus Convention by refusing to organise a public consultation on the 20 year lifetime extension of an old nuclear plant at Borssele. This has important implications for Torness which is due to submit its next Periodic Safety Review to the Office for Nuclear Regulation in January 2019. (5)

Experts estimate the 40% cut in the power station's output - it normally supplies enough electricity for 1.8m homes - will cost the French state-owned firm £100m-120m in lost revenue. That is small compared with the impact of temporary safety closures at EDF's French plants, which led profits to fall 16% last year, but it is still a blow the company could do without as it ramps up construction of the £20bn Hinkley Point C nuclear power station in Somerset. (6)

As things currently stand the UK's remaining 8.9 GW of nuclear capacity will close over a 12-year period, starting in 2023. However, rather than wondering if the AGRs could be given further life extensions, questions should now be asked about the supply implications if some, or all, of the AGRs are unable to operate as envisaged, says Anthony Froggatt of Chatham House. With Brexit raising questions about the financing and schedules for some interconnections, government policies slowing down the deployment of onshore renewables despite their tumbling costs, and the existing plans for the closure of the remaining coal stations, urgent consideration must be given to ensure supply, energy efficiency and flexibility from now on.

Onshore and offshore renewables need to be at the heart of the future system. This would be good for the environment and competitiveness, as the last few years have seen a remarkable change in economics of renewable energy and it is now recognized that by 2020 electricity from renewables will be 'within the fossil fuel-fired cost range, with most at the lower end or undercutting fossil fuels' and are already significantly lower than the current prices offered for nuclear new build. (7)

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1. Sunday Herald 6<sup>th</sup> May 2018  
[http://www.heraldscotland.com/news/16207870.Chain\\_reaction\\_\\_Hunterston\\_closure\\_sounds\\_death\\_knell\\_for\\_more\\_nuke\\_stations/](http://www.heraldscotland.com/news/16207870.Chain_reaction__Hunterston_closure_sounds_death_knell_for_more_nuke_stations/)
  2. Herald 22nd April 2018  
[http://www.heraldscotland.com/news/16175769.Revealed\\_\\_New\\_cracks\\_at\\_Scots\\_nuclear\\_reactor\\_raise\\_radiation\\_accident\\_fears/](http://www.heraldscotland.com/news/16175769.Revealed__New_cracks_at_Scots_nuclear_reactor_raise_radiation_accident_fears/)
  3. Reuters 9th May 2018 <https://uk.reuters.com/article/uk-britain-nuclear-edf-analysis/cracks-in-british-nuclear-reactor-ring-power-alarm-bells-idUKKBN1IA2P0?rpc=401&>
  4. Holyrood Magazine 3rd May 2018 <http://www.holyrood.com/articles/news/local-community-should-decide-future-hunterston-nuclear-plant-says-ross-greer>

5. Jan Van de Putte (Greenpeace) on Twitter 25th May 2018 <https://twitter.com/jputte/status/999998692076728320/photo/1>
6. Guardian 6<sup>th</sup> May 2018 <https://www.theguardian.com/environment/2018/may/06/cracks-nuclear-reactor-threaten-uk-energy-policy-hunsterston>
7. IGov 9th May 2018 <http://projects.exeter.ac.uk/igov/new-thinking-cracking-in-reactors-should-break-open-the-debate-on-future-electricity-supply/>

## 4 Hunterston A

Contractors are working on retrieving and packaging solid Higher Active Waste in 5 bunkers at the closed Hunterston A Magnox station. They started in bunker 5 in March 2014. Having done 5, 4 and 3 they expect to finish 2 in October 2018, and then finish bunker 1 in late 2019, early 2020.

As of 18th April they had filled 773 3m<sup>3</sup> boxes Overall the bunkers contain 2,200m<sup>3</sup> of solid HAW.

The Scottish Sites Meeting in Edinburgh was given a presentation about the Wet ILW Retrievals and Encapsulation Plant (WILWREP). This will deal with 180m<sup>3</sup> of sludge; 11m<sup>3</sup> resins and 141m<sup>3</sup> of contaminated acid.

The strategy at individual Magnox stations is determined partly by whether there is a shielded or unshielded store. (Hunterston has a shielded store Chapelcross doesn't). Bradwell has been drying liquid but putting it in cast iron containers; Hunterston uses steel containers.

The acid is unique to Hunterston because they used aluminium skips in the spent fuel pond. These built up a crud which is removed with acid.

WILWREP is developing new technologies and experience that could be sold abroad. Anything developed by Cavendish, Babcock becomes the intellectual property of the NDA.

## 5 Dounreay

A planning application for the next stage in the decommissioning and restoration of Dounreay will go before Highland councillors for approval at the beginning of June. Dounreay Phase 3 involves the construction of a transit flask facility – containers for transporting nuclear waste – shaft and silo waste retrieval facilities and a temporary building for the retrieval of low level waste pits. Also included in the plans are proposals for a facility to repackage waste, the demolition of all redundant buildings, land remediation, landscaping, and the dismantling of three nuclear reactors.

The waste from Dounreay's low level waste (LLW) pits will be retrieved, processed and placed in containers ready for transfer to a new LLW facility on the east side. A loading facility will be built for repackaging nuclear fuels and materials ready for transfer to Sellafield. Meanwhile, most of the buildings on the site will be demolished, apart from some Higher Activity Waste stores pending a long term solution for this waste, and a modern office block in good condition.

Councillors are being asked to approve the proposals, many at concept stage only, subject to a number of conditions requesting much more detail. It's thought 300 jobs will be created at the peak of the Phase 3 decommissioning works, which will decrease as decommissioning is overtaken by demolition and remediation work. A corresponding reduction of £10.8million local spend in the Dounreay area is also projected. (1)

The projects would help to bring about what is called an interim end state, when the decommissioning work has been completed. This is expected to be reached between 2030 and 2033. The projects would also assist in reaching a point 300 years from now when the land is deemed to be safe of any potential radioactive contamination for "unrestricted use", according to the site's operators. (2)

The in-house workforce at Dounreay is set to dip below 1,000 as the impact of the latest tranche of redundancies kicks in over the next couple of months. Site licence company Dounreay Site Restoration (DSRL) announced plans a year ago to shed 150 jobs as well as axe 50 posts provided by contractors at the Caithness site. At the time, DSRL, which is a wholly-owned subsidiary of the Babcock-led Cavendish Dounreay Partnership, said it would only consider compulsory redundancies if it failed to attract enough employees seeking early leaving packages. In the event compulsory redundancies proved unnecessary. (3)

Meanwhile, top secret flights carrying nuclear waste from Scotland to USA to continue until late 2019. (4) So far there have been five US Air Force flights carrying highly enriched uranium bound for South Carolina, taking off from Wick John O'Groats Airport, in Caithness, at weekends as the base is closed to civilian aircrafts on Saturdays. Dounreay, the Nuclear Decommissioning Authority, Police Scotland, the Civil Nuclear Constabulary and the airport have all refused to comment. The fifth flight took place in May and an expected six or seven more will follow between now and September next year. (5)

Claims that the Dounreay Site Stakeholder Group (SSG) were told that flights of HEU to the US would only last 12 months were scotched at the most recent Scottish Nuclear Sites meeting in Edinburgh in April.

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1. Press & Journal 4<sup>th</sup> June 2018 <https://www.pressandjournal.co.uk/fp/news/highlands/1489326/latest-dounreay-decommissioning-plans-up-for-approval/>
  2. BBC 30<sup>th</sup> May 2018 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-44302985>
  3. Energy Voice 25<sup>th</sup> April 2018 <https://www.energyvoice.com/otherenergy/169770/dounreay-workforce-to-dip-below-1000/>
  4. Express 1<sup>st</sup> April 2018 <https://www.express.co.uk/scotland/939840/top-secret-nuclear-waste-flights-scotland-to-usa-to-continue-until-2019>
  5. Press and Journal 7<sup>th</sup> May 2018 <https://www.pressandjournal.co.uk/fp/news/highlands/1469643/deadly-nuclear-waste-flights-resume-from-wick/>

## 6 Decommissioning

The UK government has launched a consultation on the future regulation of nuclear sites in the final stages of decommissioning and clean-up. The Department for Business, Energy and Industrial Strategy (BEIS) said the consultation seeks to enable a "*more flexible approach that can optimise waste management, thereby realising environmental benefits and reducing costs*".

Of the 36 nuclear sites located across England, Wales and Scotland, the Nuclear Decommissioning Authority (NDA) is responsible for the decommissioning and clean-up of 17. Other sites to be decommissioned in the future include the operational nuclear power stations owned by EDF Energy, and other nuclear sites in the nuclear fuel cycle, reprocessing, waste management, pharmaceutical and research sectors.

In the UK, the Nuclear Installations Act 1965 (NIA65) provides the legal framework for nuclear safety and nuclear third-party liability and sets out a system of regulatory control based on a robust licensing process administered by the Office for Nuclear Regulation (ONR). Under this regime, a site operator is required to have a licence to use a site for specified activities such as the operation of nuclear power stations. In addition to the nuclear site licensing regime, the NIA65 requires that financial provision is in place to meet claims in the event of a nuclear incident, as required under international law on nuclear third-party liability.

The consultation proposals include changing the NIA65 to allow licensees to exit the licensing regime once the site has reached internationally agreed standards and nuclear safety and security matters have been fully resolved. After the licence has been ended, the site would be regulated by the relevant environment agency and the Health and Safety Executive, in the same way that non-nuclear industrial sites undergoing clean-up for radioactive or other contamination are regulated.

Proposals for further clean-up would be assessed by the relevant environment agency under the Radioactive Substances Regulations. BEIS said this process would enable the site operator to work with the community to establish the "most appropriate" end-state for the site and would result in improved waste management and other environmental benefits.

BEIS proposes to implement two recent decisions by the OECD Steering Committee for Nuclear Energy concerning the exclusion of certain sites from the nuclear third-party regime when the main nuclear hazards have been removed and the risks to the public are small. It also proposes to tighten the licence surrender process to require a licensee to apply to ONR to surrender the licence, and to strengthen requirements for ONR to consult with HSE when the licence is surrendered or varied. (1)

The Government says the main reasons for change are:

- nuclear third party liability currently continues beyond the point at which it is no longer required. The UK has not yet implemented the decisions of the OECD Steering Committee for Nuclear Energy concerning the exclusion of certain sites from the nuclear liability regime;

- site operators wishing to exit the NIA65 licensing regime are required to clean-up the site in a way that does not allow them to balance the overall safety and environmental risks and this may result in unnecessary costs; and
- disposal facilities for radioactive waste located on nuclear licensed sites remain subject to nuclear licensing. Such sites are also regulated by the environment agencies. This is considered dual regulation which is unnecessary after nuclear safety matters have been resolved.

The UK Government Department for Business, Energy and Industrial Strategy (BEIS) published a discussion paper on the regulation of nuclear sites in the final stages of decommissioning and clean-up in November 2016. The NFLA responded here:

[http://www.nuclearpolicy.info/wp/wp-content/uploads/2016/12/Rad\\_Waste\\_Brfg\\_66\\_Delicensing\\_nuclear\\_sites.pdf](http://www.nuclearpolicy.info/wp/wp-content/uploads/2016/12/Rad_Waste_Brfg_66_Delicensing_nuclear_sites.pdf)

This response concluded that:

There is a danger that what is being proposed will simply be seen as turning nuclear sites into nuclear dumps as a way of saving money.

The concept of “optimisation” which is decided by the operator and regulators making value judgements needs to be replaced with the concept of the Best Practicable Environmental Option which uses a systematic consultative and decision making procedure.

Any part of a nuclear site upon which it is proposed to allow unrestricted use must be able to show that doses to members of the public will be of the order of 0.01mSv or less per year. Using a risk factor in conjunction with probability of receiving a dose is too flexible and unacceptable.

Any waste left on-site must be concentrated and contained in a monitorable, retrievable store.

Former nuclear operators should remain liable for any future unexpected events and should also be liable to pay for any regulatory effort in perpetuity.

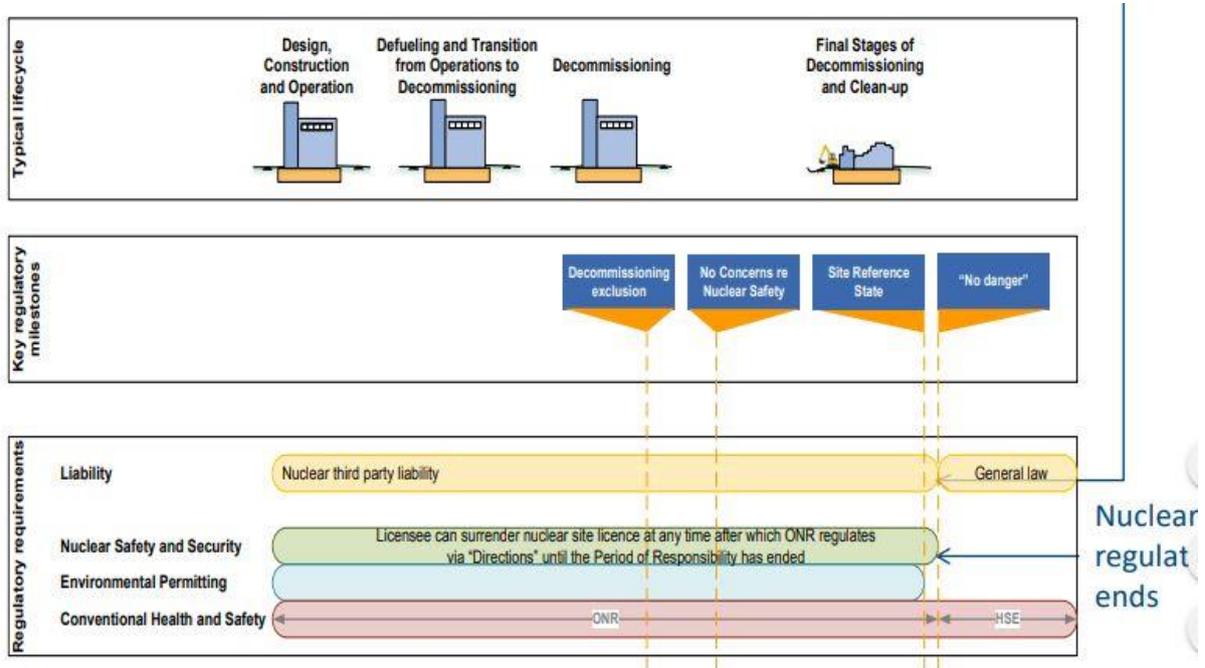
These earlier proposals appear to allow for the unrestricted use of sites which may have nuclear waste buried and which could be capable of administering doses of up to 20mSv/yr if human intrusion occurs.

The HSE Criterion for De-Licensing Nuclear Sites (2005) says the Basic Safety Standards Directive (Euratom 96/29) allows member states to exempt a practice where appropriate and without further consideration if doses to members of the public are of the order of 0.01mSv or less per year. HSE is of the view that this dose limit broadly equates to a risk of  $10^{-6}$  as well as being consistent with other legislation and international advice relating to the radiological protection of the public. 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  $10^{-6}$  per year is equivalent to a calculated dose of around 0.02mSv/yr, where the probability of receiving the dose is one.

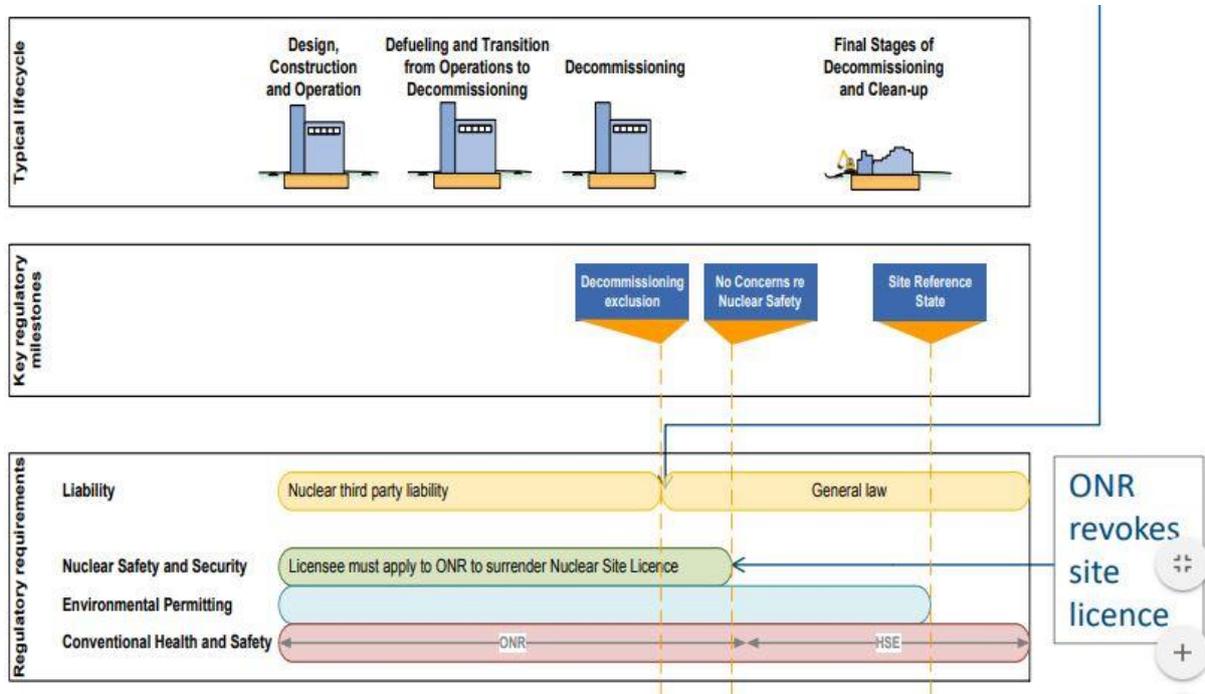
The consultation is open until 3<sup>rd</sup> July, and is available here

<https://www.gov.uk/government/consultations/the-regulation-of-nuclear-sites-in-the-final-stages-of-decommissioning-and-clean-up>

### Existing Regulatory Framework



### Proposed Regulatory Framework

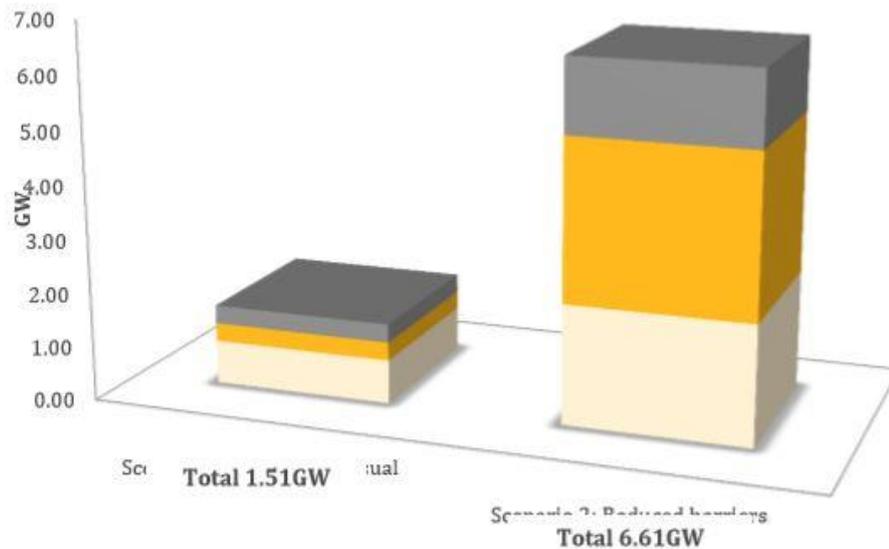


1. World Nuclear News 10<sup>th</sup> May 2018 <http://www.world-nuclear-news.org/WR-UK-seeks-to-improve-decommissioning-regime-10051801.html>

## 7 The Future of Solar in Scotland

At the Scottish Solar Trade Association’s (STA) Conference on 31st May 2018 in Glasgow a ‘Business As Usual Scenario’ in which solar capacity would reach 1.51GW by 2030 was compared to a “Reduced Barriers” scenario showing that solar could contribute 6.61GW by 2030. (1)

### 2030 Solar PV Deployment



	Scenario 1: Business as usual (GW)	Scenario 2: Reduced barriers (GW)
■ Ground Mount	0.35	1.38
■ Commercial	0.34	3.00
■ Domestic	0.82	2.23

This could mean:

9,000 new jobs; £1.5bn towards GDP; £540m off energy bills; 2.8bn kg CO2 reduction in emissions.

### Barriers include:

Business rates are a key barrier to the further development of commercial rooftops. (And is a problem for some proposed heat networks as well such as Govan).

The lack of available grid connections is a problem in some areas;

There has been a delay in implementing the promised “permitted development” for solar;

And Building Standards still need some improvements especially for commercial properties.

## Domestic Sector

For new build Scotland is significantly ahead of the rest of the UK as far as building regulations are concerned. Perhaps 50% of new houses now include solar. The next round of building regulations needs to bring this up to 100%.

The Energy Efficiency Standard for Social Housing (EESH) means Scotland is ahead on social housing, but owner occupiers and private rented properties remain difficult. Under EESH2 many council properties will need to reach EPC B by 2032 – that is better than many new houses now. For areas off the gas grid and houses with no cavity, a 4kW solar array can be a big boost by helping a house could jump from, say, a D to a B Energy Performance Rating.

## Grid Connections

Grid constraints may mean not being able to connect up new solar capacity. This is where batteries can help persuade the grid company to provide a connection. Sharing a connection between wind and solar has been successful in a couple of places. (Mackie's Ice Cream for instance). Scottish Water Horizons has developed a solar farm scheme on Speyside (740kW + 494kW) to power pumping stations. This has batteries as well to smooth out any peaks and make the most of self-generation.

## Large-scale solar

STA want 1.38GW of solar farms – only 41MW so far. If you match land available with grid connections you find that it would only get us half way there. So there will need to be more private wires, flexible connections and co-sharing with wind.

## Commercial Rooftops

This needs to be a big area for expansion with about 2.66GW extra by 2030. 3GW would only cover 10% of the available south-facing roof space. But unfortunately business rates haven't gone down despite reduced income after the removal of FiTs. So it is now a much larger proportion of the income made from a commercial scheme. This needs to change.

A new report from the Solar Trade Association (STA), called *Leading Lights (2)*, featured in the NFLA latest briefing on decentralised energy (3) shows how local councils are leading the way on solar by building modern solar homes, developing 'subsidy-free' solar farms, master planning 'smart' neighbourhoods and using solar to save money and provide stable sources of revenue to fund services. The report features a business park under development by Perth and Kinross Council which will feature roof mounted and ground mounted solar connected via private wires so that tenants can be sold electricity by the Council.

## Stirling Council

Gregor Wightman of Stirling Council spoke at the STA Conference about solar projects in. Interestingly he showed pictures of façade mounted solar on some house with roofs sloping the wrong way; and increasingly storage batteries are being installed for householders. The council has invested £6.1m in solar PV between 2012 and 19 and has now installed solar PV on almost 2,500

properties with a total capacity of 7.26MW. The average saving to tenants is £272 per year. 94 batteries have been installed so far with plans for 200 by 2019/20. (4)

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1. Solar Policy Statement: the key to unlocking Scotland's Renewable Potential, <https://www.solar-trade.org.uk/wp-content/uploads/2017/05/STA-Scotland-Solar-Policy-Statement.pdf> and STA Scotland: Key solar asks for the Scottish Government, Nov 2016 <https://www.solar-trade.org.uk/wp-content/uploads/2016/02/Asks-Scottish-Government-for-Nov-2016.pdf>
  2. Leading Lights, STA, April 2018 <https://www.solar-trade.org.uk/wp-content/uploads/2018/04/localauthority-solar-guide-WEB.pdf>
  3. Decentralised energy and the climate change imperative - an update on progress across local government in the UK and Ireland, NFLA Policy Brief No. 175 [http://www.nuclearpolicy.info/wp/wp-content/uploads/2018/05/A288\\_NB175\\_Decentralised\\_energy.pdf](http://www.nuclearpolicy.info/wp/wp-content/uploads/2018/05/A288_NB175_Decentralised_energy.pdf)
  4. Stirling Council 28th September 2018 <https://my.stirling.gov.uk/news/view/30867/date:09-2017/type:all>

## 8 Renewable Heat Notes

- A study by the British Geological Society (BGS) into how groundwater in former mine workings could be used to drive city-scale district heating systems could transform the way Scottish households and businesses heat their homes. If there is a sufficient flow of groundwater into and through old abandoned mine workings, then it could be feasible to extract some of the heat out of that groundwater to drive a district heating network. (1) A £9m project will initially involve drilling narrow boreholes filled with instruments to survey temperature, seismic activity, water flow, acidity and other variables to establish the state of the water in the rocks below the city. The aim will be to establish whether this warm water can be extracted for long periods to heat Glaswegian homes. Drilling of the first test boreholes - at sites yet to be selected - is the first part of an initiative by the BGS: the creation of several UK geo-energy observatories. One test system has been selected for Scotland: the Glasgow Geothermal Energy Research Field Site. A second has been proposed for Cheshire - where scientists want to study rock conditions to assess the possibility of using underground vaults as storage for heated water. (2)
- Fife Council has begun work on one of Scotland's largest district heat networks. The scheme, which has already attracted a great deal of attention and interest, is fairly unique as it utilises the availability of an existing large biomass combined heat and power plant currently owned by RWE. As Ross Tulloch, programme manager for Glenrothes Energy Network at the Council explains, the opportunity to work towards a district heating network for council buildings began in talks with RWE, who originally installed the biomass boiler for the nearby Tullis Russell paper mill. (3)

- The cumulative additional cost of decarbonising the UK's heating system by 2050 could be as high as £450 billion, research for the government's infrastructure advisory body has concluded. According to a new study carried out by consultancy Element Energy & E4tech for the National Infrastructure Commission, all options for heat decarbonisation are “significantly more costly” than continuing with the status quo. The report estimates that under the worst case assumption in the study, the additional cost could be as high as £450bn. But its central cost assumption is that the additional costs of heat decarbonisation will work out at £120bn to £300bn. The study estimates that the average annual cost of heating per household will be £100 to £300 higher in 2050 than in the status quo. The study says that these figures for increased costs have to be placed in the context of the wider growth of the economy, which it expects to triple in size by the middle of this. However, a comparison of the main pathway options finds that re-purposing the gas grid to deliver low carbon hydrogen – if this option can be delivered safely and at scale – is the lowest cost option under most scenarios studied and cheaper than switching to mainly electric heating. (4)
- Hydrogen produced from surplus wind and solar energy can become cheaper than natural gas by the 2030s, according to new analysis by Berlin-based Energy Brainpool. Technological advancements such as the mass production of electrolyzers will lead to economies of scale and enable lower capital expenditure. Meanwhile, the higher penetration of wind and solar power in the grid will allow for excess renewable energy to generate storable hydrogen. (5)
- Heat batteries developed by Sunamp are highly likely to make conventional hot water cylinders obsolete in a relatively short space of time. The batteries are barely a third of the size of a typical household hot water cylinder. The company is currently prototyping much larger versions capable of scaling up to provide the heating needs of commercial companies from palette-sized to container-scale. These would be ideal as a supplemental driver for large scale district heating networks. In a domestic heating context the batteries can be run off photo voltaic solar panels on the house roof, off-peak or renewable grid electricity, heat pumps, biomass or conventional boilers. The commercial scale or district heating models can be configured to capture waste heat directly. In 2013, the Department of Energy and Climate Change, gave Sunamp a contract to put the thermal storage system, alongside off-peak electricity and air-source heat pumps, in seven homes as a proof of concept trial. That was very successful - we were able to heat the homes at half the cost of natural gas. In 2017 Sunamp won a fiercely contested competitive contract from Local Energy Scotland, on behalf of the Scottish Government, to put heat batteries into 650 homes. These were in two housing associations, East Lothian Housing and Castle Rock Edinvar. (6)

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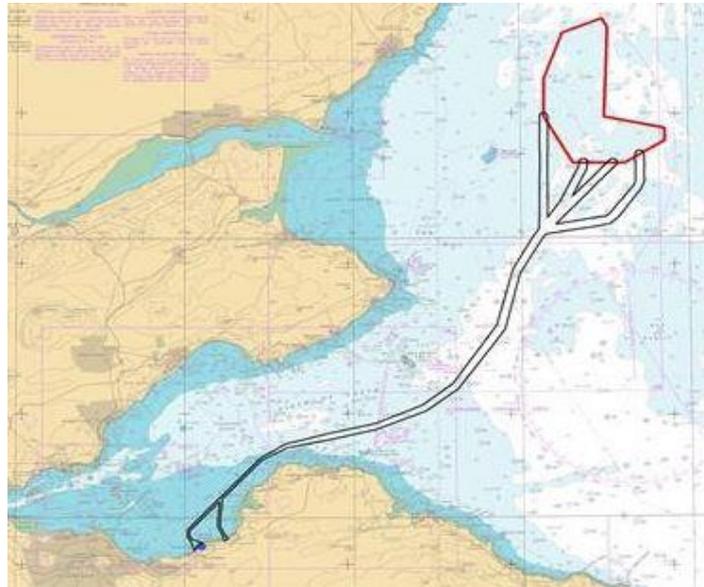
1. Herald 30<sup>th</sup> April 2018  
[http://www.heraldscotland.com/business\\_hq/16194201.COMMERCIAL\\_FOCUS\\_\\_Abandoned\\_mineworkings\\_could\\_provide\\_the\\_innovative\\_geothermal\\_solution\\_to\\_district\\_heating\\_systems/](http://www.heraldscotland.com/business_hq/16194201.COMMERCIAL_FOCUS__Abandoned_mineworkings_could_provide_the_innovative_geothermal_solution_to_district_heating_systems/)

2. Observer 8<sup>th</sup> April 2018 <https://www.theguardian.com/environment/2018/apr/08/energy-home-heating-uk-cities-geology>
3. Herald 30<sup>th</sup> April 2018 [http://www.heraldscotland.com/business\\_hq/16194156.COMMERCIAL\\_FOCUS\\_\\_New\\_\\_24m\\_district\\_heating\\_scheme\\_in\\_Fife\\_will\\_bring\\_power\\_to\\_the\\_people/](http://www.heraldscotland.com/business_hq/16194156.COMMERCIAL_FOCUS__New__24m_district_heating_scheme_in_Fife_will_bring_power_to_the_people/)
4. Edie 23<sup>rd</sup> May 2018 <https://www.edie.net/news/10/Decarbonising-UK-s-heating-system-could-cost--450-billion/>
5. Wind Power Monthly 24th April 2018 <https://www.windpowermonthly.com/article/1462904/cost-wind-generated-hydrogen-fall-below-natural-gas>
6. Herald 30<sup>th</sup> April 2018 [http://www.heraldscotland.com/business\\_hq/16194298.COMMERCIAL\\_FOCUS\\_\\_After\\_the\\_sun\\_comes\\_a\\_new\\_battery/](http://www.heraldscotland.com/business_hq/16194298.COMMERCIAL_FOCUS__After_the_sun_comes_a_new_battery/)

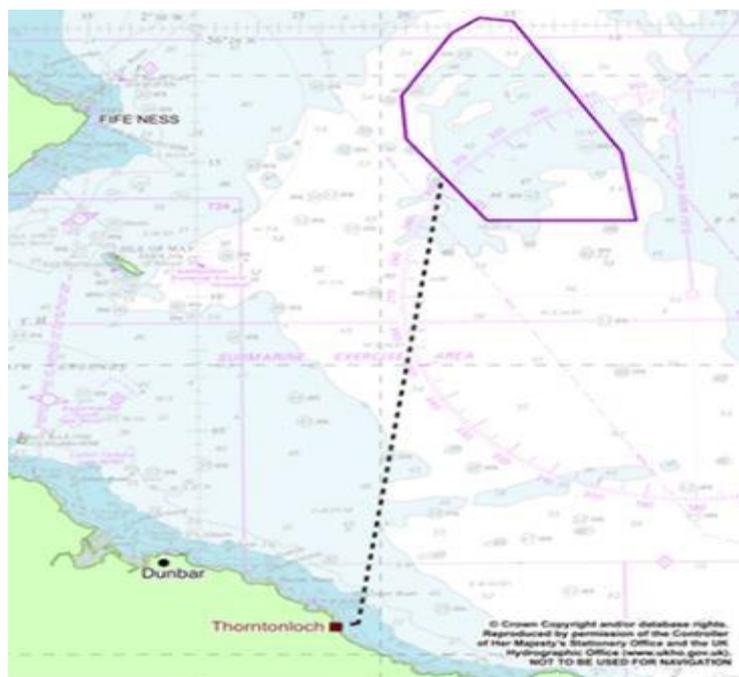
## 9 Renewable Notes

- Wind turbines in Scotland provided a 44% increase in power delivered to the National Grid during the first quarter of 2018 compared with the same period in 2017. Across the UK wind provided more electricity than nuclear during the same period. The opening in December of a new power cable between Scotland and north Wales helped unlock electricity from Scottish windfarms. The Western 'Bootstrap' Link has drastically cut the amount of money paid by National Grid to windfarms for curtailment. The company paid £100m in 2017 for curtailment. This year payments are already down by two-thirds. (1)
- Vattenfall has confirmed that the last of the 11 turbines – the world's most powerful – has been put in place at its European Offshore Wind Deployment Centre (EOWDC) off Aberdeen. The project earlier faced legal challenges from Donald Trump. (2)
- Giant 200m high turbines have been proposed for the isle of Lewis by Lewis Wind Power (LWP), a joint venture by energy giants EDF and Wood Group. The firm already has permission to build a total of 91 150m-tall turbines but say increasing the size will reduce the number required and generate more energy. However, locals have reacted with anger over the new plans. Calum Macdonald, former Western Isles MP and developer of the three-turbine Beinn Ghrideag community wind farm, described the scale of the proposed turbines as "simply staggering". Beinn Ghrideag is owned by the Point and Sandwick Trust and raises around £900,000 a year for local causes. Rhoda MacKenzie, spokeswoman for four common grazings committees who want to develop their own community schemes, has warned the turbines will be "intrusive" and could put off visitors the area. (3)
- Equinor, formerly Statoil, is meeting members of Western Isles council to explore the feasibility of an array of floating windfarms in the Atlantic Ocean, a few miles off the isle of Lewis. But formal selection of a site will not take place until 2021/22, with deployment set for after 2026. (4)

- SNP ministers have caused a political row by calling in an application by Red Rock Power to build an electricity substation on the site of the old Cockenzie power station in East Lothian. The company is a subsidiary of the State Development and Investment Corporation (SDIC), China's largest government-owned investment fund. It wants to build a sub-station to connect wind turbines to the national grid as part of its Inch Cape project in the North Sea. (5)



- EDF has bought the large offshore wind project off the coast of Fife for more than €500m from developer Mainstream Renewable Power. The project, which will cost EDF a further £1.8bn to complete, will ultimately generate 450 megawatts of energy. The project, dubbed Neart na Gaoithe, which means "strength of the wind" in Gaelic, was delayed by several years because of a legal challenge concerning its impact on seabirds. (6)



- The BIG HIT energy programme in Orkney has marked another milestone with the official handover of two hydrogen tanker trailers from supplier Calvera. These new trailers for the safe and efficient transportation of ‘green hydrogen’ increase the Orkney fleet of hydrogen tube trailers to five. This is part of the £10.9 million EU-supported Building Innovative Green Hydrogen systems in an Isolated Territory programme (BIG HIT). The ‘green hydrogen’ is produced on-site at the European Marine Energy Centre on the northern island of Eday. The hydrogen is then transported to Kirkwall by the fleet of hydrogen-tube trailers aboard the inter-island ferry service. (7)
- Europe's most northerly solar farm is poised to be built on an abandoned airfield in Moray after receiving planning permission. The 50 megawatt (MW) project in Elgin is almost four times bigger than the 13MW Errol solar farm in Perth, currently the largest of its kind in Scotland. Environmental campaigners believe the north-east could become a “hotspot” for solar energy because of the area’s huge amount of daylight hours during the summer while retaining easy connections to transmit the energy. (8)

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- (1) Business Green 9th April 2018 <https://www.businessgreen.com/bg/news/3029756/scottish-wind-power-enjoys-record-breaking-start-to-2018> Guardian 16th May 2018 <https://www.theguardian.com/environment/2018/may/16/wind-power-overtakes-nuclear-for-first-time-in-uk-across-a-quarter>
  - (2) The National 28th May 2018 [http://www.thenational.scot/news/16254457.Milestone\\_for\\_major\\_green\\_energy\\_project\\_that\\_Trump\\_tried\\_to\\_stop/](http://www.thenational.scot/news/16254457.Milestone_for_major_green_energy_project_that_Trump_tried_to_stop/)
  - (3) Scotsman 1st May 2018 <https://www.scotsman.com/news/environment/outrage-at-bid-to-build-tallest-onshore-turbines-on-lewis-1-4733225>
  - (4) Energy Voice 31st May 2018 <https://www.energyvoice.com/otherenergy/172965/equinor-considering-western-isles-for-another-hywind-site/>
  - (5) The National 13th April 2018 [http://www.thenational.scot/news/16156224.\\_No\\_link\\_between\\_FM\\_\\_\\_s\\_China\\_meeting\\_and\\_Cockenzie\\_move/](http://www.thenational.scot/news/16156224._No_link_between_FM___s_China_meeting_and_Cockenzie_move/)
  - (6) Telegraph 3rd May 2018 <https://www.telegraph.co.uk/business/2018/05/03/edf-energy-wades-offshore-major-wind-farm-deal/>
  - (7) Scottish Energy News 3rd March 2018 <http://www.scottishenergynews.com/orkney-rolls-out-expansion-of-green-hydrogen-tanker-trailer-fleet/>
  - (8) Times 27th May 2018 <https://www.thetimes.co.uk/edition/scotland/sunny-scotland-set-for-highlands-solar-farm-cfzg0s7b> and Press & Journal 30th May 2018 <https://www.pressandjournal.co.uk/fp/news/moray/elgin/1486070/campaigners-press-for-north-east-to-become-hotspot-for-solar-energy/>

## 10 Energy Efficiency

Nicola Sturgeon has set a target for all homes in Scotland to meet an Energy Performance Certificate (EPC) rating of at least Band C by 2040. The proposed requirement is outlined in ‘Route Map to an Energy Efficient Scotland’, which was launched for consultation by the Scottish First Minister in a speech at the All Energy conference in Glasgow. The route map proposes that all domestic properties are required to achieve an energy efficiency rating of ‘at least’ EPC C by 2040 at the latest. Just over a third of owner-occupied homes, which account for 61% of domestic housing in Scotland,

currently meet the EPC C standard. The route map confirms that landlords of privately rented homes will be required to achieve an EPC rating of Band E from April 2020 when they let out their properties, rising to D from 2022. (1)

Government funding of more than £54m was also announced for tackling fuel poverty in Scotland. The funding will also support local authorities to expand existing energy efficiency and fuel poverty programmes. Fabrice Leveque, of Scottish Renewables, said the route map failed to capitalise on Scotland's emerging renewable heat industry. He said: *"It is vital that the Scottish government progresses its proposals to support district heat networks and demonstrates how the programme will support technologies like heat pumps, biomass and solar to ensure that the heat we generate is not only used in the most efficient way but is low carbon too."* (2)

WWF Scotland said *"homeowners must be supported to take action to upgrade their homes faster than proposed if we are to meet existing and future climate change targets and reap the benefits of a low carbon future. We cannot afford to wait until 2040. New financial incentives and regulation for minimum standards of energy efficiency are now needed to improve people's homes, drive down climate emissions and create new jobs in communities across the country."* (3)

Funding of £3.5 million was announced to help social housing landlords make their properties more energy efficient. The decarbonisation fund will support councils and housing associations to install measures such as solar panels or air source heat pumps. Housing Minister Kevin Stewart announced the move during a debate at the Scottish Parliament. *"As well as assisting social landlords in decarbonising their heating, the fund will also encourage innovative thinking and fresh ideas, and is open to expressions of interest from today. This is part of more than £5 million of additional funding to support the Energy Efficient Scotland: Transition Programme, which will continue to provide a mix of advice, grant and low cost loans to support property owners over the next two years."* (4)

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1. Utility Week 2nd May 2018 <https://utilityweek.co.uk/sturgeon-launches-energy-efficient-route-map-scotland/> The Route Map is available here: <http://www.gov.scot/Resource/0053/00534980.pdf>
  2. BBC 2nd May 2018 <http://www.bbc.co.uk/news/uk-scotland-scotland-business-43983257>
  3. Holyrood 2nd May 2018 <http://www.holyrood.com/articles/news/nicola-sturgeon-unveils-%C2%A3545m-make-buildings-%E2%80%9Cwarmer-greener-and-more-energy-efficient>
  4. Energy Voice 11th May 2018 <https://www.energyvoice.com/other-news/171194/scottish-government-announce-3-5-million-toward-social-housing-energy-efficiency/>