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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/2020/01/NuclearNewsNo121.pdf>

1 Hunterston B

EDF Energy has attempted to justify shrinking the emergency planning zone around its cracked nuclear reactors at Hunterston to one kilometre. The current zone – within which evacuation, sheltering and anti-radiation pills are planned in the event of an accident – is a radius of 2.4 kilometres from the power station. EDF has told North Ayrshire Council that urgent protective measures are only “*justified within a maximum distance of 1km from the site for protection of the public*”. Its assessment was based on the “*most pessimistic*” assumptions, it said.

Campaigners have criticised EDF's move, warning that an accident could send a plume of radioactive contamination over Glasgow and Edinburgh. They have called for the emergency zone to be expanded, not contracted.

EDF stressed that its advice was that one kilometre was the “*minimum*” recommended distance. North Ayrshire Council is consulting with local residents before it decides what distance to implement. (1)

Crumbling Cores

As reported previously, the graphite cores of the two reactors have begun to crumble as cracks spread, prompting safety inspectors to impose tough new conditions threatening future operations. Technical reports released by the Office for Nuclear Regulation (ONR) reveal that at least 58 fragments and pieces of debris have broken off the graphite bricks that make up the reactor cores. According to ONR there is “*significant uncertainty*” about the risks of debris blocking channels for cooling the reactor and causing fuel cladding to melt. (2)

ONR warns that it will require “*more robust arguments*” before it agrees to allow the two reactors to restart in 2020. It also highlights concerns about the risk of “*fuel snagging*” from “*multiple cracked bricks*” and says that previous predictions have underestimated cracking.

But EDF Energy insists that graphite debris does not “*pose a risk to nuclear safety*”, and ONR's additional requirements are about “*theoretical risks which are extremely unlikely to develop*”. (3)

Radiation consultant, Dr Ian Fairlie, described ONR's latest reports as *"very worrying"* using *"harder language"* which makes you wonder why ONR granted a four month extension to reactor four in August. *"Taken together the new revelations strengthen the calls by local residents to close both reactors at Hunterston B."*

Reactor 4, which has an estimated 209 cracks, was shut down for over ten months before ONR allowed it to restart in August – but only for four months – it was closed again on 10 December to carry out further graphite inspections and report the results to the ONR. EDF Energy is hoping it will get permission from ONR to go back on-line on 13th March 2020. It is also hoping its safety case for Reactor 3 will be approved to allow it to be re-started on 28th February – although these dates are fairly meaningless: EDF is required by market rules to give dates to the National Grid for restarts. (4) The dates it has given over the past year have proven to be hopelessly optimistic.

The Hunterston Site Stakeholders Group, which was due to meet on December 5, was cancelled due to the General Election, provoking anger locally. (5)

New Emergency Planning Arrangements

The UK's regulations for radiological protection and emergency preparedness around nuclear sites are being updated. The new legislation, known as REPPiR 2019: Radiation (Emergency Preparedness and Public Information) Regulations became UK law on 22 May 2019 with local authorities given a year to implement the changes. The new regulations require Local Authorities to determine the size of the Detailed Emergency Planning Zone (DEPZ). The DEPZ is an area around a nuclear facility which requires detailed emergency plans to be prepared. Historically, this area was determined by the Office of Nuclear Regulation (ONR) and is currently delineated by a 2.4km circle around Hunterston. In future the zone will take account of local geography, topography and practical details like roads and settlements and may therefore be more irregular in size and shape – but more reflective of the conditions on the ground. ONR will continue to regulate arrangements under its approved code of practice and nuclear operators, including EDF Energy, will continue to provide technical guidance to Local Authorities for local plans.

As part of the implementation process EDF has submitted a Consequence Report (6) to North Ayrshire Council. This report sets out the technical justification for determining the minimum distance of the DEPZ. The Council is in the process of considering the contents of the Consequence Report, using the technical advice provided by the operator, they have also sought independent advice from Public Health England (PHE) and their own knowledge of the local population, geography and infrastructure. Once all of the information is assessed it will be utilised to determine the DEPZ boundary. In the meantime, the small number of households currently within the DEPZ will continue to receive information and pre-distributed stable iodine tablets to allow them to be prepared in the unlikely event of an offsite release of radiation. (7)

DEPZ

EDF accepts, however, that food restrictions may be required over a much wider area. *"It is recommended that advice be issued within 24 hours to restrict consumption of leafy green*

vegetables, milk and water from open sources/rain water in all sectors of the detailed emergency planning zone and downwind of the site to a distance of 43km," it says.

Dr Ian Fairlie, described EDF's report as "deficient" and "misleading". The suggested emergency zone was "much too small", he argued, and there was a "lack of openness and clarity" that would leave local people uncertain what to do in the event of a major accident. He added: "The issue of the pre-distribution of prophylactic potassium iodate tablets is not mentioned. This already occurs in most European countries, and should occur here as well in order to avoid the health consequences of breathing in radioactive iodine which is a gas."

Rita Holmes, who chairs Hunterston's local stakeholder group, pointed out that at the moment only 13 households close to the plant were given iodine tablets in advance. "It would seem a simple precaution and unwise not to pre-distribute within a wider area".

Friends of the Earth Scotland pointed out that seven years after the explosions at the Fukushima nuclear reactors in Japan in 2011, some areas more than 20 kilometres away were still prohibited zones. "The current Hunterston zone is already very modest in comparison to the very large area which would be affected in the event of a serious accident at the plant," said the environmental group's director, Dr Richard Dixon.

"With increasing worries about the safety of the reactors at Hunterston now is definitely not the time to reduce the level of protection on offer to the local community," he argued. "EDF are the last people who should propose what size the exclusion zone should be around their own nuclear sites because it is in their financial and PR interests to make the zone as small as possible."

North Ayrshire Council is planning to agree the detailed emergency planning zone for Hunterston in January (at its Cabinet meeting on 21st). "We can go beyond the operator's recommendations if there is clear justification based on factors detailed in the regulations," said the council's head of democratic and administrative services, Andrew Fraser.

"To help inform this we are consulting with Public Health England's centre for radiation, chemical and environmental hazards and also consulting those within the current 2.4km zone. Consultation responses will help inform whether there is a case to go beyond the 1km recommended by EDF."

EDF Energy insists it is not urging North Ayrshire Council to reduce its emergency planning zone. "The regulations require that all nuclear operators provide technical advice to each local authority on the minimum distance recommended for the DEPZ. The final decision on the DEPZ rests with the local authority which will consider this report alongside other local factors." (8)

The local newspaper, the Largs and Millport Weekly News sees the Council's plans as a way of cutting the number of people being given tablets to combat the effect of a nuclear leak from the ageing reactors. The proposal was labelled as ridiculous by Rita Holmes, chair of the site stakeholder group, who believes the emergency zone should be widened not reduced. She continued "unfortunately the quarterly Hunterston site stakeholders group has been cancelled this month because of the general election so we are not even getting the opportunity to discuss it ... by the time the next meeting comes around in March, the decision will already have been taken." (9)

SNP Councillor, Alan Hill, Councillor for North Coast and Cumbraes, has expressed his concern saying: *“The proposed zone barely extends beyond the perimeter of the power station. It is hard to escape the conclusion that EDF has taken this transfer of responsibility to try to achieve a reduction of their responsibilities with a corresponding increase to the risk to public health and safety. Are they suggesting that with all of the issues to do with cracking and crumbling of the blocks within the reactor that it is in fact now safer than it was before? The submission smacks of a degree of complacency which very few residents will share.”* (10)

Small Modular Reactor for Hunterston?

Tory Councillors on North Ayrshire Council are putting forward a motion to support the construction of a Small Modular Reactor at Hunterston. Councillors Todd Ferguson and Tom Marshall say the move will *‘protect the nuclear industry and professional workforce’* in the area. SNP Councillor Alan Hill however says he has reservations about the plans: *“We are going to be decommissioning Hunterston for decades to come ... there will be jobs at the site in future years. Obviously any loss of jobs is regrettable, but the solution to the problem is not to build a new nuclear power station. “In a country like Scotland we have potential for wind and wave energy and we don’t require nuclear on that basis.”* (11)

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1. The Ferret 22nd Nov 2019 <https://theferret.scot/emergency-zone-hunterston-nuclear-reactors/>
 2. The Ferret 17th Oct 2019 <https://theferret.scot/hunterston-graphite-debris-nuclear/>
 3. ONR (accessed) 29th Oct 2019 <http://www.onr.org.uk/civil-nuclear-reactors/hunterston-b-graphiteblocks.htm>
 4. EDF Energy 10th Dec 2019 <https://www.edfenergy.com/media-centre/news-releases/letter-hunterston-site-stakeholder-group-10-december-2019>
 5. Largs & Millport Weekly News 3rd Dec 2019 <https://www.largsandmillportnews.com/news/18060410.anger-hunterston-watchdog-scrutiny-meeting-cancelled/>
 6. Hunterston B Consequence Report <https://www.north-ayrshire.gov.uk/Documents/CorporateServices/ChiefExecutive/hnb-reppir-consequences-report.pdf>
 7. North Ayrshire Council (accessed) 3rd Dec 2019 <https://www.north-ayrshire.gov.uk/community-safety/reppir-2019.aspx>
 8. The Ferret 22nd Nov 2019 <https://theferret.scot/emergency-zone-hunterston-nuclear-reactors/>
 9. Largs & Millport Weekly News 4th Dec 2019 <https://www.largsandmillportnews.com/news/18076154.plan-revealed-cut-number-people-given-tablets-combat-effects-radiation-leak-ageing-hunterston-power-station/>
 10. Largs and Millport News 1st Jan 2020. <https://www.largsandmillportnews.com/news/18130090.safety-downgrade-hunterston-smacks-complacency/>
 11. Largs and Millport Weekly New 25th Dec 2019 <https://www.largsandmillportnews.com/news/18106636.news-reveals-plan-new-nuclear-reactor-hunterston-site/>



2 Hunterston A and Chapelcross

Magnox is looking at reviewing its plans for “End State”. The End State is the point at which Magnox Ltd could walk away from the site. The company has a new executive, now that it has become a subsidiary of the NDA. So, it is obviously a good time to review timing and affordability. They also want to look again at the idea of ‘continuous decommissioning’ so there isn’t a 60-80yr period of care and maintenance when skills are lost.

In addition, the Environment Agencies have a new Guidance on Requirements for Release from Radioactive Substance Regulation, which gives Magnox a better idea of where they need to get to. (1)

There is a limited capacity of landfill sites permitted to take Low and Very Low-Level Waste. UK-wide there is a capacity of only 1.2m m³, but 4m m³ (excluding radioactively contaminated land) which requires disposal. There are no suitable disposal sites in Scotland.

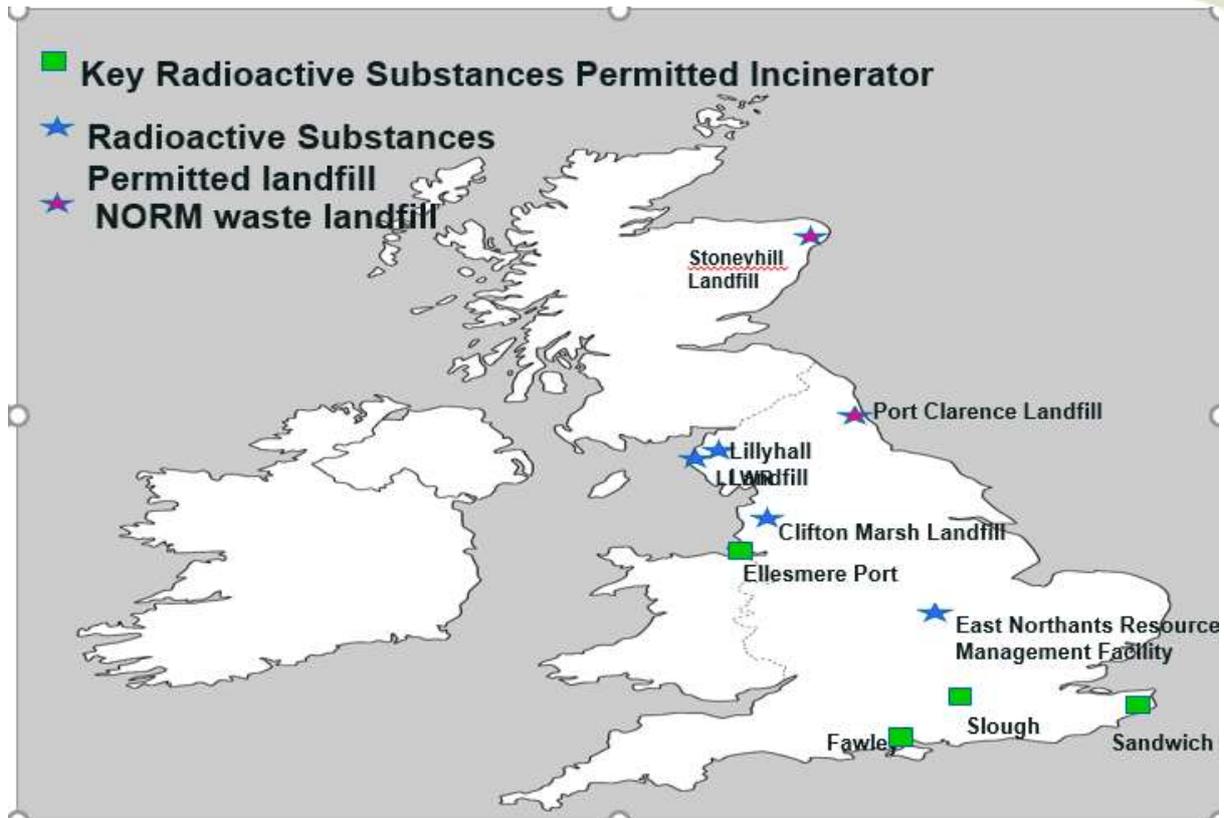
This situation is driving Magnox to look more seriously at on-site disposal. Looking at Trawsfynydd for example, off-site disposal would involve 6,300 lorry movements each travelling 200 miles.

Hunterston A has established an ‘End State Group’. At some point the SSG will be invited to join. The group is beginning to understand what could be left on site, and starting to do initial radiological assessments and optimisation requirements.

The group is developing a strategy paper which will go to the NDA next March.

The current ‘End State’ is to dig up all waste (including contaminated soil) and transport it off site. An alternative might be to build a store on-site, or it could be left in-situ. It is possible that on-site disposal could meet the requirements needed to allow unrestricted use of the site. (2)

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1. Guidance on Requirements for Release from Radioactive Substance Regulation, SEPA, EA and Natural Resources Wales, July 2018 <https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf>
 2. Copies of the Magnox presentation to the Scottish Sites meeting in October 2019 available on request. An earlier presentation was given to NuLeaf in 2016 http://www.nuleaf.org.uk/wp-content/uploads/2016/12/NuLeAF-engagement-presentationIW_December-16_v3-without-photos.pdf



3 Dounreay

The Scottish Environment Protection Agency (Sepa) have been investigating the accidental release of radioactively contaminated dust at Dounreay in February. The Agency concluded that Dounreay Site Restoration Ltd (DSRL) "*contravened multiple*" regulatory conditions. The dust was disturbed during testing of a ventilation system, and although there was no breach of discharge limits and any environmental impact was "very low", Dounreay's radioactive substances authorisation was contravened.

Dounreay Site Restoration Ltd said: "*A regulatory notice has been received from Sepa following its investigation into an event from February in one of our facilities.*" (1) The notice outlines the steps it is required to take to address the breaches before October 2020.

DSRL has been told to take action to prevent a recurrence of the radioactive leak. The radioactive dust vented out of the uranium recovery plant following the failure of a valve while the system was being tested. Earlier this year, the site operators were served with a 'final warning letter' following a probe by Sepa into alleged shortcomings in the system to stop radioactive gases from Dounreay polluting the environment. (2)

Transports

Transports of civil separated plutonium from Dounreay to Sellafield have now been completed. The NDA describes this as a major step forward in decommissioning and cleaning-up the Dounreay site.

(3) The transfer of Highly Enriched Uranium by air to the United States was completed earlier this year. (4) But only around half of the jammed breeder fuel in the Dounreay Fast Reactor (DFR) has been removed and dispatched to Sellafield for reprocessing. (5) Recovering the jammed elements began in 2017, so it could take another 2 years to finish the job. (6) Not all of this fuel is going to arrive at Sellafield in time to be reprocessed in the Magnox Reprocessing Plant which is scheduled to close this year, so arrangements are being made to dry store the remainder of the breeder fuel at Sellafield.

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1. BBC 12th Dec 2019 <https://www.bbc.co.uk/news/uk-scotland-highlands-islands-50757953>
 2. STV 10th Dec 2019 <https://stv.tv/news/highlands-islands/1443040-dounreay-nuclear-power-plant-warned-over-radioactive-leak/>
 3. NDA 23rd December 2019 <https://www.gov.uk/government/news/nda-completes-transfer-of-plutonium-from-dounreay>
 4. Press and Journal 28th May 2019 <https://www.pressandjournal.co.uk/fp/opinion/columnists/david-ross/1757032/david-ross-dounreay-shipments-may-be-coming-to-an-end-but-some-of-the-greatest-clean-up-challenges-remain/>
 5. BBC 15th Oct 2019 <https://www.bbc.co.uk/news/uk-scotland-highlands-islands-50055003>
 6. Energy Voice 14th Oct 2019 <https://www.energyvoice.com/otherenergy/nuclear/209706/half-remainingfuel-elements-in-dounreays-reactor-removed/> See here for a short video <https://www.gov.uk/government/news/half-the-fuel-gone-from-iconic-dounreay-reactor>

4 Dalgety Bay

A clean-up operation to deal with the radioactive contamination at Dalgety Bay is being held up by local landowners, according to the MoD. But the landowners dispute this.

Thousands of radioactive particles have been found on the shore at Dalgety Bay since 1990. The objects are believed to come from eroded landfill that contains debris from Second World War aircraft that originally had radium dials.

Stephen Ritchie of the MoD told councillors: *"We actually have had cabinet approval, ministerial approval – we have all the funding we need and authority to proceed. However, the local stakeholders are dragging their feet. We can't get on the land to clean up the waste without the landowners' permission. There are four stakeholders for the area – one of which is the Crown, which is obviously not an issue. However, the other three have been dragging their feet."*

Mr Ritchie told councillors that the MoD were looking to award the contract to a company to remove the waste by December 13, but if talks continued to stall, they could miss their window and the project would be delayed, meaning that the clean-up might not be able to happen in 2020. (1)

The main landowner, Dalgety Bay Sailing Club, accused the MoD of "bullying tactics" and said the suggestion they were at fault was *"completely unfounded, inaccurate and misleading."*

It said they have been "co-operating fully" with the MoD and SEPA over the past 18 months and that legal agreements for compensation and the transfer of land ownership, which would allow access and the work to progress, have actually been delayed by the MoD who have not responded to repeated requests for action.

Councillor David Barratt told the Dunfermline Press: "*The MoD and UK Government have procrastinated and delayed for decades. In recent years, when we looked set to finally make progress, there have been further delays caused by the UK Government failing to sign off key stages. Far from dragging their feet, I am led to believe local stakeholders have been proactive in pursuing an agreement to ensure the works progress as planned.*" (2) By early January 2020 it appeared that the work has yet to be commissioned, but on the other hand it is not clear that 13th December was a real deadline.

Cancer Statistics

An analysis of the area's cancer statistics to date by ISD Scotland (part of NHS Scotland) has found "no significant increase in overall cancer risk" for those living in any part of Dalgety Bay. Even for cancers with a known link to radiation, such as myeloid leukaemia, thyroid cancer or female breast cancer, no significant increased risk was found. The report also said it is difficult to rule out the risk altogether given the likely delay between radiation exposure and cancer onset, and the probability that many residents will have moved in and out of the area over the decades. It said: "*The period of time between exposure and the diagnosis of cancer, and the mobility of the population, mean that a true association might not be apparent.*"

Dr Ian Fairlie says the main thing to take from the report is that there are cancer increases. ISD shouldn't be using the term "statistically significant" See <https://www.ianfairlie.org/news/uk-and-us-scientists-call-for-statistical-significance-tests-to-be-dropped-in-health-studies/>

What they should have said is although there are increases these have not been found to pass our statistical tests. Oddly the ISD expect the cancers to meet a 99% confidence limit. Normally you'd expect to use a 95% limit. The Government's Committee Examining Radiation Risks of Internal Emitter (CERRIE) argued that 90% would be more appropriate. The numbers of cancer cases in Dalgety Bay were always going to be too low to meet any kind of statistical tests anyway. (3)

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1. STV 13th Nov 2019 <https://stv.tv/news/east-central/1442361-work-to-clean-up-radioactive-beach-delayed-by-landowners/> and Fife Today 14th Nov 2019 <https://www.fifetoday.co.uk/news/dalgety-bay-radiation-clean-up-stalled-by-landowners-1-5045747>
 2. Dunfermline Press 25th Nov 2019 <https://www.dunfermlinepress.com/news/18058068.dalgety-bay-sailing-club-hits-back-bullying-tactics/>
 3. Herald 11th Dec 2019 <https://www.heraldscotland.com/news/18092393.dalgety-bay-report-finds-no-significant-increased-risk-cancer/>



5 Scottish Climate Policy

Scotland must match the ambition of its world-leading Net Zero 2045 target with decisive action to strengthen climate change policy in all parts of the economy, according to the Committee on Climate Change. (CCC) (1) Decisions over the next 12 months are likely to determine the direction of the next 25 years.

Next year, Glasgow will host the most important global climate summit since COP21 in Paris in 2015. These crucial talks offer a major opportunity to increase global ambition and effort to cut emissions. The UK's credibility as COP26 President – and Scotland's, as hosts – now rests on real action at home.

The CCC's 2019 Progress Report to the Scottish Parliament shows that greenhouse gas emissions reduced by 3% in 2017, compared to a 10% fall in 2016. The fall was again led by the power sector, due in large part to Scotland's first full year of coal-free electricity generation. Recent performance in other sectors shows only incremental improvement at best and, unless emissions reductions are delivered economy-wide, Scotland is at risk of missing its new interim target of a 56% reduction in emissions by 2020.

Lord Deben, Chairman of the Committee on Climate Change (CCC) said:

“Scotland needs to walk the talk. The new legally-binding target for 2030 – a 75% reduction in emissions compared to 1990 – is extremely stretching and demands new policies that begin to work immediately. The spotlight is now on Scotland's plan to deliver meaningful reductions across all sectors of the economy, including from buildings, road transport, agriculture and land use.”

The CCC's Annual Report said *inter alia*:

Promising new measures for green finance, new-build homes and transport have been put in place – now they must start delivering in the real world. Scotland's plans for a long-term agriculture strategy are lagging behind plans in England and Wales, annual tree planting rates must continue to rise, and energy efficiency measures must be extended to non-residential buildings.

Scotland's ability to deliver its net-zero target is contingent on action taken in the UK, and vice versa. Westminster must match Scottish policy ambition if Scotland – and the UK as a whole – is to make progress in key sectors where legislative powers are 'reserved'. Both governments must work more closely to make the best use of devolved and reserved policy levers in key areas where responsibilities are split, including the future of heating, electric vehicles and low-carbon infrastructure.

Scotland's next Climate Change Plan must set out a comprehensive strategy detailing the policies and governance that will drive a rapid, sustained transformation to a net-zero society. Net-zero planning must be embedded across all levels of government in Scotland, it must also engage the public, provide a stable direction of travel and set out a simple, investable set of rules and incentives for business.

Commenting on the report, Tom Ballantine from Stop Climate Chaos Scotland said:

“Now that Scotland has a new Climate Act and stronger targets for cutting emissions, this report shows that, in order to meet those targets, urgent action is needed across every sector of the economy ... the new Climate Change Plan must go much further than existing promises and set out how the Government plans to cut emissions in transport, heating and agriculture, areas where we have so far seen little progress.” (2)

Scotland’s climate change targets need to be backed up by funding in the upcoming budget, according to the Climate Emergency Response Group (CERG) - a collection of like-minded leaders spanning Scotland’s private, public and third sectors bodies. (3) It has challenged the Scottish Government to put the climate emergency “at the heart of the Scottish budget” when it is delivered by the Finance Secretary. CERG has released a report looking at ways public spending can support Scotland’s transition to net-zero emissions by 2045 - a 12-part action plan, based on spending between 1% and 2% of GDP towards hitting the emissions target as recommended by the CCC. This would require an annual investment of between £1.8 billion and £3.6 billion. Among the proposed policies is funding to support city centres to be vehicle-emission free by 2030 through investment in public transport, walking, cycling, and electric vehicles. (4)

Rebecca Lunn, head of Strathclyde University’s Centre for Ground Science and Geoengineering, gave evidence to the Scottish Parliament’s Economy Committee on behalf of the Royal Society of Edinburgh. She repeated the dubious claim that electrifying transport is expected to double the amount of electricity needed by Scotland. If predictions of 35 million electric vehicles in the UK by 2040 are correct that could put undue strain on infrastructure. She says there would need to be a huge increase in renewable energy capacity to fill the expected gap between generation and demand in the coming decades. (5)

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1. CCC 17th Dec 2019 <https://www.theccc.org.uk/2019/12/17/new-ambitious-actions-needed-for-a-net-zero-scotland/>
 2. Stop Climate Chaos Scotland 17th Dec 2019 <https://www.stopclimatechaos.scot/scottish-government-must-take-immediate-and-decisive-action-to-cut-scotlands-emissions-says-new-report/>
 3. See <https://www.changeworks.org.uk/cerg> and <https://energysavingtrust.org.uk/about-us/news/twelve-point-plan-tackle-scotlands-climate-emergency>
 4. Twelve point plan to tackle Scotland’s climate emergency <https://www.changeworks.org.uk/sites/default/files/CERG%2012-point%20plan.pdf> STV 9th Jan 2020 <https://news.stv.tv/politics/climate-change-funding-must-be-at-heart-of-scottish-budget/>
 5. Times 18th Dec 2019 <https://www.thetimes.co.uk/edition/scotland/msps-warned-on-green-energy-demand-p6rnkcv3t>

6 Hydrogen Debate and the Future of Heat

An argument about the future use of hydrogen, in particular for heating, has been raging amongst energy professionals and lobbyists since the Government announced it was looking at setting a date by which all boilers on sale would be “hydrogen ready”, meaning they can burn natural gas but can also be converted easily to burning hydrogen. It was also announced that the natural gas supply at Keele University is being blended with 20% hydrogen in a trial that’s of national significance.

Households could soon be required to install a boiler capable of burning hydrogen when they next upgrade their central heating system. The government has already pledged to ban installation of fossil fuel heating systems in new homes from 2025. In November Sajid Javid, the chancellor, visited the headquarters of Worcester Bosch to inspect its prototype hydrogen-ready boiler. The company says the boilers would be available by 2025. They would be £50-£100 more expensive than existing boilers, which typically cost about £900. The benefit over existing boilers is that they can continue burning natural gas but be converted to burning hydrogen in an operation that will cost about £150 and take a gas engineer one hour.

The Department for Business, Energy and Industrial Strategy’s Hy4Heat programme aims to determine the feasibility of hydrogen for heating in homes and includes work with industry to develop prototype hydrogen appliances, including hydrogen ready boilers. About 1.7 million boilers are replaced each year so if they were required to be hydrogen-ready from 2025 most homes would have the necessary boiler by the mid-2030s to allow a switch to hydrogen. (1)

One of the arguments in favour of converting our gas boilers to hydrogen is that we have poorly insulated houses with insufficient space for installing a heat pump. If you were to design a heating policy from scratch, you would not choose hydrogen. You would build well-insulated houses that use electric heat pumps. (2) Worcester Bosch argues that a house needs to have an Energy Performance Certificate rating of C or above for a heat pump to be able to heat the house effectively. According to them of the 3,276,000 UK properties within the EPC band C rating, some 3,223,000 have a condensing boiler. One of the ways of jumping one clear band within the EPC methodology is to replace a non-condensing boiler with a condensing version. This means that many of the properties in band C are really constructed to band D levels of fabric and therefore unsuitable as they stand for a heat pump installation. (3)

Ed Matthew Associate Director at independent climate and energy think tank E3G says hydrogen is the wrong choice for heating homes. Blue hydrogen (manufactured from natural gas) needs CCS so would be massively expensive and keeps us hooked on gas. Green hydrogen (made by electrolysis using renewable electricity) is 4 times less efficient than using heat pumps. *“Hydrogen is being pushed by the gas industry. Beware.”*

Dave Toke, reader in energy politics at Aberdeen University agrees. He calls it: *“the start of one of the greatest pieces of greenwash that have been committed in the UK.”* The oil and gas industry is promoting so-called ‘blue hydrogen’, that is hydrogen produced by ‘reforming’ natural gas, and capturing the carbon dioxide that is produced. Yet currently most hydrogen is produced by

reforming natural gas and not capturing carbon dioxide, a process that will dramatically increase carbon dioxide emissions if hydrogen is used to heat homes. The efficiency of the gas reformation process is only around 65% meaning that much more carbon dioxide is generated to produce the hydrogen as fuel compared to simply burning the natural gas. He says any claims that the process will be done using carbon capture and storage, beyond that is a few demonstration projects supported by public grants, should be taken with a wagon load of salt.

But even if 'green' hydrogen generated by renewable energy were used, it would still be a grossly inefficient way of using that renewable energy. Renewable energy is normally distributed through the electricity system where it can power heat pumps in homes (either individually or through district heating systems) to much greater effect. The heat pumps use electricity much more efficiently compared to any hydrogen boilers, no matter how the hydrogen is produced. Indeed, a heat pump may increase the efficiency of the use of renewable energy by approaching fourfold compared to using 'green hydrogen' in a boiler. (4)

Richard Black from the Energy and Climate Intelligence Unit (ECIU) told BBC News: *"We will and should have hydrogen in the mix of energy options, but it's not a wonder solution to everything, which you sometimes get the impression from the rhetoric. There is hope – but too much hype."* (5)

Commentators also argue about the cost with some saying hydrogen will prove too expensive for mass usage, while others say switching to the use of electricity for heating will be far more costly than gas central heating and will put enormous strains on the grid during the winter months. However, heat battery manufacturer, Sunamp, claims that using an air source heat pump on off-peak electricity in conjunction with a heat battery can heat a house for a price comparable with gas central heating.

Lord Deben, chair of the Committee on Climate Change, has expressed confidence that a way will be found to produce hydrogen, which could provide a low carbon substitute for natural gas in heating systems, cheaper than is currently possible. (6)

The Commonwealth Home Plan (see below) is sceptical about relying on the conversion of the gas grid to hydrogen. And moving to electric heating would roughly increase by a factor of five peak load on the grid which would require significant upgrades to cope. It prefers instead the idea of building district heating networks which can deliver heat from solar thermal, geothermal and industrial waste heat recovery.

New research commissioned by industry body Scottish Renewables shows the Scottish Government's new Heat Networks Bill could see the equivalent of 460,000 homes – around a fifth of Scotland's total - heated renewably by 2030, cutting emissions from heat by 10% and helping tackle the climate emergency. The research found 46 potential heat network projects across Scotland's seven cities. The networks would initially serve 45,000 homes but could, with the right Scottish Government support, grow ten-fold by 2030. (7)

To date the Scottish Government has said the new Heat Networks Bill will *"support, facilitate and create controls [for] the development of district heating"* - but is yet to confirm the details. In response to this ongoing uncertainty industry has published, alongside the new research, a set of

recommendations on how the Bill should support new projects. The potential projects represent a significant economic opportunity. Civil engineering such as the digging of trenches and laying of pipes accounts for 40% of a typical heat network's costs, often using locally-sourced labour.

Star Renewable Energy, has installed a heat pump which can extract the small amount of heat generated by the Clyde. The river has an average temperature of around 10°C but engineers can boost it up to 80°C for use in homes. (8)

Meanwhile the HyDeploy pilot involving injecting hydrogen into Keele University's existing natural gas network, which supplies 30 faculty buildings and 100 domestic properties is now operational. (9) And 7 industrial partners have been pledged to support a demonstration project in Denmark, which, with offshore wind as a power source, will produce renewable hydrogen that can be used in road transport. (10)

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 2. Times 4th Jan 2020 <https://www.thetimes.co.uk/article/an-exciting-carbon-free-future-depends-on-hydrogen-boilers-6ktqwpgw0>
 3. See The Future of Fuel, Worcester Bosch, 2019 https://www.worcester-bosch.co.uk/img/documents/hydrogen/The_Future_of_Fuel.pdf
 4. Dave Toke's Blog 4th Jan 2020 <https://realfeed-intariffs.blogspot.com/2020/01/why-uk-government-may-be-encouraging.html>
 5. BBC 2nd Jan 2020 <https://www.bbc.co.uk/news/science-environment-50873047>
 6. Edie 6th Dec 2019 <https://www.edie.net/news/10/Lord-Deben-chides-politicians-for-failing-to-act-on-decarbonisation-of-heat/>
 7. Scottish Renewables 11th Nov 2019 <https://scottishrenewables.createand.com/campaigns/reports/viewCampaign.aspx>
 8. Times 12th Nov 2019 <https://www.thetimes.co.uk/article/667e8b5c-04d4-11ea-872c-a98e8bfab8fc>
 9. Edie 2nd Jan 2020 <https://www.edie.net/news/8/UK-s-first-grid-injected-hydrogen-trials-begin-in-Staffordshire/>
 10. Orsted 20th Dec 2019 <https://orsted.com/da/Media/Newsroom/News/2019/12/945369984118407>

7 Balancing Renewables

Thousands of households were paid to use extra renewable electricity over the first weekend in December as windfarms generated unprecedented levels of clean power. Homes using a new type of smart energy tariff were urged to plug in their electric vehicles overnight and set their dishwasher on a timer to take advantage of the record renewables in the early hours of the morning.

The blustery weather helped windfarms generate almost 45% of the UK's electricity on Sunday 8th December setting a record. At times there was more wind power than the UK needed. In the past, only energy-intensive companies would be able to claim a fee for helping to balance the system by making use of the extra electricity. However, homes using smart-meter tariffs can now claim a renewables windfall too. Octopus Energy, said that 2,000 homes on the supplier's Agile Octopus smart-energy tariff "*made money for using energy when the wind was giving us more than enough*". (1)

In Cornwall 100 homes have been fitted with batteries and solar panels, to act as a mini virtual power plant for the local energy network. The homes took part in the trial alongside 150 local businesses, which were prepared to adjust how much energy they used depending on the balance of energy supply and demand on the grid. If wind and solar power output dropped the companies could choose to use less electricity in exchange for a payment from National Grid, or if the local grid had more electricity than it needed the companies could ramp up their energy demand. National Grid already offers to pay firms that own utility-scale batteries to provide a similar service, but the trial is the first time that companies can take part in the same "local energy market" as the network operator. The trial could help create a nationwide chain of flexible smart grids built around clean energy. (2)

100% Renewables

Meanwhile Mark Jacobson of Stanford University has published a study which charts a road map for 143 countries to attain 100% clean, renewable energy by the year 2050. It would cost \$73 trillion to revamp power grids, transportation, manufacturing and other systems to run on wind, solar and hydro power, including enough storage capacity to keep the lights on overnight. But that would be offset by annual savings of almost \$11 trillion, paying for itself in 7 years. (3)

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1. Guardian 9th Dec 2019 <https://www.theguardian.com/business/2019/dec/09/thousands-were-paid-to-use-extra-renewable-electricity-on-windy-weekend>
 2. Guardian 11th Nov 2019 <https://www.theguardian.com/environment/2019/nov/11/cornish-homes-take-part-in-trial-to-supply-clean-power-to-grid>
 3. Bloomberg 20th Dec 2019 <https://www.bloomberg.com/amp/news/articles/2019-12-20/going-100-green-will-pay-for-itself-in-seven-years-study-finds> and Stanford University (accessed) 20th Dec 2019 <https://web.stanford.edu/group/efmh/jacobson/Articles/I/WWS-50-USState-plans.html>

8 Ground Source Heat Pumps

Around 10% of the UK's total peak heat demand could be supplied from heat pumps under parks and public green spaces, according to new research carried out by climate charity Possible - formerly known as 10:10.

As well as providing around 30GW of heat, the idea would also improve air quality and generate income for councils and park authorities to re-invest locally. (1) Glasgow, which is greener than most cities, has been identified as the local authority area in Scotland with the highest untapped capacity for ground source energy. The city council is actively considering the technology. Saughton Park in Edinburgh already has heat pump technology. Possible reckons Glasgow, North Lanarkshire and Edinburgh all have substantial ground source heat potential. Possible said Glasgow alone could use its parks and other green spaces to meet 297 megawatts of peak heat demand, cutting UK carbon emissions by 83,000 tonnes each year. Engineers have calculated that heat pumps under the city's parks and playing fields could warm up to 49,000 homes. (2)

There's a video about the Possible project here: <https://www.wearepossible.org/latest-news/powering-parks>

Meanwhile, in Sunderland, residents in 364 homes across seven tower blocks are getting their gas boilers replaced with heat from ground source heat pumps. There will be a ground source heat pump for each flat which will also be connected to a district heating system consisting of ambient shared ground loop arrays. An underground aquifer will provide the heat source for the tower blocks, accessed via open loop boreholes drilled to depths of 60m. Unlike other district heating schemes tenants each have an independent heat pump which means they can shop around for their electricity deal, Gentoo Group is delivering the 'Core 364' project with the support of Engie and ground source heat pump specialists, Kensa Contracting. Work started in October, with all systems expected to be replaced by late Summer 2020. The heating system will provide heat and hot water at a much reduced cost. (3) For more info see the presentation made by Kensa to the APSE Energy Summit in October https://www.apse.org.uk/apse/assets/File/Day%20%20-%20Session%205_2%20-%20Matthew%20Black.pdf

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1. Business Green 9th Dec 2019 <https://www.businessgreen.com/bg/news/3084523/heat-pumps-under-parks-could-warm-five-million-homes>
 2. Times 6th Dec 2019 <https://www.thetimes.co.uk/article/times-chistmas-appeal-2019-heat-farmers-suck-energy-from-the-earth-m8jz0m5cm> and Herald 9th Dec 2019 <https://www.heraldsotland.com/news/18090317.renewable-energy-potential-city-parks-can-win-win-win/>
 3. New Power 20th November 2019 <https://www.newpower.info/2019/11/sunderland-tenants-to-swap-gas-for-ground-source-heat/>

9 Offshore Wind Jobs

Scotland has missed out on hundreds of millions of pounds of work in the creation of one of the country's biggest offshore wind farms to overseas firms. Unions are furious at what they see as "*the scraps off the table*" that Scotland has received in the work on the £2 billion Neart Na Gaoithe (NnG) wind farm off the Fife coast. (1)

Burntisland Fabrications (BiFab) is in line to build some of the foundation jackets which anchor the turbines down to the seabed. It is understood that a minimum of eight of the 54 steel foundation jackets will be built in Scotland with the rest being constructed in south east Asia. And the 54 x 8MW turbines will be assembled at the Port of Dundee - EDF Renewables will invest around £40 million into the Port of Dundee over the next three years. Forth Ports said the pipeline of work in both offshore wind and decommissioning means this isn't a short-term pipeline but one that will give 10 years of work or more. (2)

Eyemouth Harbour has been selected as the preferred location for a maintenance base which would employ about 50 people. In addition, EDF Renewables has more than doubled its Edinburgh staff to 100 in recent months. Eyemouth Harbour was selected as preferred supplier for operations and maintenance of the wind farm for over 25-years its lifetime. (3)

The contracts will come as a relief to many in the industry. (4) But Scotland has lost further important project work, worth hundreds of millions of pounds to England, Germany, Finland and France and south-east Asia. Burntisland Fabrication (BiFab) will see its Arnish yard mothballed despite accounts indicating the firm stemmed its haemorrhaging losses by over £42 million. (5) The Arnish yard on the Isle of Lewis had been working on a contract for the Moray East Offshore Wind Farm that created more than 100 jobs and revitalising the Lewis facility back in March. But the Moray project is now nearing completion. (6)

Construction of NnG has started, as Irish utility ESB has bought a 50% share in the project. The investment builds on significant ESB involvement in offshore wind off the Irish coast. Offshore construction on the project will begin in June 2020 and commissioning is expected in 2023.

CS Wind Campbeltown

Nicola Sturgeon is being urged to intervene to help another Scottish offshore wind contractor. CS Wind, based near Campbeltown in Argyll - the only UK facility manufacturing onshore and offshore wind towers - reveals that hopes of preventing the axing of 80% of the staff remain slim, while it also confirms it has lost vital work on a Scottish wind farm. The factory, bought over by the South Korea-based firm in 2016, has announced it will cut up to three-quarters of its workforce, despite recording pre-tax profits of £7.1 million last year. The update - signed off by the managing director Yun-Cheol Kim - confirmed that a major project to deliver towers for the Beinn an Tuirc wind farm (A Scottish Power wind farm about 7.5 kilometres north of Campbeltown) would "no longer" be manufactured at CS Wind's UK factory. (7)

A second Scottish offshore wind project is Inch Cape windfarm off the coast of Angus. Unlike NnG this one wasn't successful in September's Contracts for Difference energy auction. Despite the setback, Chinese-owned Red Rock Power Limited is committed to making the project a reality. It has consent for 72 turbines located 15 kilometres from Arbroath. Inch Cape has an existing grid connection at Cockenzie in East Lothian. In addition to Inch Cape, Red Rock Power owns Afton operational onshore windfarm in East Ayrshire and a 25% share of the recently completed Beatrice offshore windfarm in the Moray Firth. (8)

Nine years ago, the Scottish Government said large-scale development of offshore wind represented *“the biggest opportunity for sustainable economic growth in Scotland for a generation”*. Scotland’s deputy first minister John Swinney predicted that offshore wind would create nearly 30,000 direct jobs by 2020. The current figure of direct jobs in the sector is 1,900. Workers union Unite accused the Scottish Government of offshoring jobs to other countries. (9) Unions have become increasingly concerned the nation is losing out financially and have called for urgent action to ensure it is cashing in on the economic opportunities. They are calling for an end to multinational interests *“calling the shots”* north of the Border. (10)

Claire Mack chief executive of Scottish Renewables says make no mistake about it: the announcement of contracts for the Neart Na Gaoithe Offshore Wind Farm show that this sector in Scotland is truly up and running. The contracts announced so far will create jobs in the Scottish Borders, Fife, and Dundee, and potentially even further afield across Scotland. The initial contract announcement has been made, but this is an enormous project that will require a hugely diverse range of skills and technologies, and there’s likely to be more good news to come as its development progresses. Scotland, with 25% of Europe’s offshore wind resource, stands at the beginning of its journey into offshore wind, and we’re now starting to experience the very real economic benefits this exciting industry can deliver north of the Border. Already the Beatrice Offshore Wind Farm has created almost 100 permanent jobs in one of Scotland’s most economically fragile regions. There, offshore wind is delivering skilled, well-paid employment, and we’re now starting to see the Neart Na Gaoithe project delivering on its promise too. With historic delays now behind us we stand at the starting line for this sector in Scotland. Our plans for offshore wind are staggering. The Sector Deal struck between industry and the UK Government earlier this year aims for 30GW of offshore wind in UK waters by 2030. Following on from that deal, the Scottish Offshore Wind Energy Council was set up to deliver an offshore wind sector which plays to Scotland’s strengths, delivering jobs, investment and export opportunities in line with that UK Sector Deal as a key part of the path to net-zero. (11)

There has been a bitter war of words between two Scottish trade unions and the Scottish Government with the unions accusing the Government of inaction over jobs at troubled firm Burntisland Fabrication (BiFab). Scottish energy minister Paul Wheelhouse said his government was doing everything within its *“existing, limited devolved powers”* to retain and boost job numbers. (12) A Ministerial summit will be held early this year. (13)

The Scottish Government has launched two consultations to help develop wind energy capacity and work towards net zero goals. The consultations will inform the pipeline of future offshore wind development and improve understanding of the nation’s role in reaching carbon-neutral status. Views are being sought on the draft Offshore Wind Policy Statement and the draft Sectoral Marine Plan for Offshore Wind Energy, which outlines how the government plans to maximise the opportunities that offshore wind presents and will inform the next round of seabed leasing for offshore wind in Scottish waters. (14)

The Marine Plan increased its assessment on how much offshore wind could be accommodated in Scottish waters from 8 to 10 gigawatts. A delay in the publishing of the plan was holding up the next seabed leasing round in Scotland, which will include dedicated acreage for floating wind. Floating wind is currently limited to pilot projects as it stands. The largest planned project is Equinor’s

Hywind Tampen install standing at 88 megawatts. Floating wind structures borrow a lot of engineering from oil and gas platforms making the technology a good candidate to transition existing workers and supply chains from that sector. (15)

Unsurprisingly, the Queen’s Speech included the promised ramp-up in the offshore wind target from 30 to 40 gigawatts by 2030. What was perhaps less expected was the idea that the Government would also “enable new floating turbines.” The U.K.’s contracts for difference (CFD) scheme has successfully pulled the cost per megawatt-hour of regular offshore wind all the way down to £39.65 (\$51.73). The industry is pretty much unified on how that success should be replicated for floating wind. “*We’d like to see something like an ‘innovation pot’ within the CFD,*” Rebecca Williams, head of policy and regulation at trade group RenewableUK says. “*That would enable that technology to undergo its journey towards commercialization and to see commercial-scale projects brought forward.*” (16)

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 2. Dundee Courier 2nd Dec 2019 <https://www.thecourier.co.uk/fp/business/business-news/1031791/40m-to-be-invested-in-port-of-dundee/>
 3. NS Energy 28th Nov 2019 <https://www.nsenerybusiness.com/news/company-news/edf-renewables-neart-na-gaoithe-offshore/>
 4. Times 29th Nov 2019 <https://www.thetimes.co.uk/article/5553299c-122a-11ea-96fb-8041210fa214>
 5. Energy Voice 20th Dec 2019 <https://www.energyvoice.com/otherenergy/214418/bifab-yard-to-be-mothballed-despite-firm-cutting-losses-by-42m/>
 6. Energy Voice 11th Dec 2019 <https://www.energyvoice.com/otherenergy/213763/bifab-workforce-concerned-as-nng-contract-talks-drag-on/>
 7. Herald 5th Dec 2019 <https://www.heraldscotland.com/news/18079828.fears-jobs-cs-wind/>
 8. Dundee Courier 18th Nov 2019 <https://www.thecourier.co.uk/fp/business/business-news/1022148/firm-still-determined-to-make-inch-cape-windfarm-a-reality/>
 9. Energy Voice 25th Nov 2019 <https://www.energyvoice.com/otherenergy/212712/scottish-government-criticised-over-fantasy-offshore-wind-job-figure/>
 10. Herald 29th Nov 2019 <https://www.heraldscotland.com/news/18067837.unions-fear-wind-power-economic-boom-just-full-hot-air/>
 11. Herald 29th Nov 2019 <https://www.heraldscotland.com/opinion/18067900.claire-mack-scotland-start-off-shore-wind-journey/>
 12. Energy Voice 16th Dec 2019 <https://www.energyvoice.com/otherenergy/214037/war-of-words-as-unions-accuse-scottish-government-of-inaction-over-bifab/>
 13. Herald 17th Dec 2019 <https://www.heraldscotland.com/news/18105411.minister-wind-farm-summit-pledge-scots-renewables-jobs-scandal/>
 14. Energy Live News 18th Dec 2019 <https://www.energylivenews.com/2019/12/18/scotland-launches-wind-energy-and-net-zero-consultations/>

15. GTM 20th Dec 2019 <https://www.greentechmedia.com/articles/read/floating-wind-by-royal-appointment-uk-edges-closer-to-dedicated-tenders>
16. GTM 20th Dec 2019 <https://www.greentechmedia.com/articles/read/floating-wind-by-royal-appointment-uk-edges-closer-to-dedicated-tenders>

10 Energy Efficiency

Citizens Advice Scotland (CAS) has urged the Scottish Government to boost funding to make homes more energy efficient by £256 million a year. The Scottish Government's target is to raise the energy performance of all homes in Scotland to at least a C rating – and a B rating for all social housing – by 2040. New research by CAS estimates the combined total investment required by the Scottish Government, homeowners and private landlords is likely to be at least £11 billion over the next 20 years, or £550 million a year. The charity believes the Scottish Government's contribution towards this cost should be at least £256 million per year, more than doubling its current £119 million a year budget. (1)

The Scottish Government has launched a consultation on setting standards for energy efficiency on owner-occupied homes.

Under the Energy Efficiency Standard for Social Housing post-2020 (EESH2) a challenging and ambitious target is set for social rented homes to achieve an Energy Performance Certificate (EPC) band B by December 2032, or to be as energy efficient as practically possible within the limits of cost, technology and necessary consent.

From 1 April 2020, private landlords will need to meet minimum energy efficiency standards (EPC Band E) for new tenancies, and for all tenancies by 31 March 2022. After that, all new tenancies must meet minimum energy efficiency standards of EPC Band D for new tenancies after 1 April 2022 and for all tenancies by 31 March 2025.

But 62% of homes in Scotland are owner occupied. Only 38% of owner-occupied homes are at EPC band C or better, but the number has risen steadily since 2014, but around 930,000 homes are still below that level. This new consultation outlines proposals to set a standard for energy efficiency and make it legally binding on homeowners from 2024 onwards.

The Scottish Government is seeking views on whether the standard should be fixed at EPC Energy Efficiency Rating band C, or whether periodic review points should be built in, so that the standard can increase over time if necessary to respond to the global climate emergency, or change focus to further encourage uptake of renewable heating as technology and policy develops. The Government is proposing a start date of 2024. From that date onwards the standard would need to be met when defined trigger points are reached. These trigger points could be for instance the point of sale, and potentially when there is a major renovation. (2)

If a seller is unwilling or unable to bring their home up to standard before sale, then the responsibility would fall on the buyer to bring the property up to the required EPC standard within a

time limit, likely 12 months. The Scottish Government said this extra burden would be reflected in house prices for such properties. Fines would be levied for non-compliance, although the government did not indicate at what level they would be set. The rules would mark a major step towards addressing emissions from houses not covered by policies for the social housing or private rental sector. The Scottish government estimates the new rules could impact 36 per cent of households over a decade, making a sizeable dent in the almost one million owner occupied homes across Scotland that are currently rated below EPC C. (3)

New rules will also be introduced to ensure all new homes built in Scotland use renewable or low-carbon heating from 2024. Renewable and low-carbon systems will also be phased in for new non-domestic buildings from 2024. (4)

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1. Energy Voice 3rd Jan 2020 <https://www.energyvoice.com/otherenergy/215116/extra-cash-needed-to-make-homes-more-energy-efficient-says-charity/>
 2. Scottish Government 19th Dec 2019 <https://www.gov.scot/publications/energy-efficient-scotland-improving-energy-efficiency-owner-occupied-homes/>
 3. Business Green 20th Dec 2019 <https://www.businessgreen.com/bg/news/3084782/scottish-government-proposes-legal-requirement-for-all-owner-occupier-homes-to-hit-epc-c-from-2024>
 4. BBC 5th Jan 2020 <https://www.bbc.co.uk/news/uk-scotland-50993183>

11 Carbon Capture & Storage

A ground-breaking new project to permanently lock up carbon dioxide in undersea rock formations off the Scottish coast could be up and running within the next five years.

An agreement – between the newly formed North East Carbon Capture, Usage and Storage Alliance (Neccus) and the Scottish Government – outlines a joint commitment to decarbonise some of the country’s biggest emitters of greenhouse gases. It also lays the foundations for establishing a new “carbon dioxide takeaway” industry that will capitalise on Scotland’s unique geology, world-leading offshore expertise and established oil and gas infrastructure.

The Acorn carbon capture and storage scheme, based at St Fergus gas terminal near Peterhead, will be the first project taken forward under Neccus and could be operational by 2024. In its early stages it will have the capacity to deal with around half of all carbon dioxide emissions from industry in Scotland – around five million tonnes a year – with potential to accommodate up to 40 million tonnes when at full scale. Existing gas pipelines will be repurposed to transport carbon dioxide from industrial centres such as Grangemouth to Peterhead to be disposed of, while the town’s deep-water port will allow shipments to be brought in by sea. A plant will also be set up at the site to turn natural gas into cleaner hydrogen, which can be used to heat homes and businesses and power lorries, buses and trains while emitting only water as a byproduct. (1)

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1. Scotsman 27th Nov 2019 <https://www.scotsman.com/news/environment/pioneering-carbon-storage-scheme-could-be-in-place-in-scotland-by-2024-1-5052724>

12 COP26

Glasgow Science Centre is to be Scotland's base for a series of events during next year's COP26 UN Climate Change Summit. The Scottish Government has formed a partnership with the centre and will work with it to design an inclusive programme for people and community groups from across the country at the 26th session of the Conference of the Parties (COP26) next November. More than 30,000 delegates are expected to attend the event at Glasgow's SEC campus. (1)

When the Summit takes place at the SEC between November 9 and 20 it will be the largest the UK has ever hosted, with up to 200 world leaders expected to attend for the final weekend. (2) In her new year message Nicola Sturgeon said Scotland will be at the "centre of international attention", so it would be a chance to show Scotland 'leading by example' in energy transition. (3)

Unfortunately, the COP25 talks in Madrid were unable to reach consensus in many areas, pushing decisions into next year, making the Glasgow Summit absolutely crucial. UN secretary general António Guterres said he was "disappointed" with the results of COP25 and that "*the international community lost an important opportunity to show increased ambition on mitigation, adaptation & finance to tackle the climate crisis.*" (4)

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1. The National 27th Nov 2019 <https://www.thenational.scot/news/18061708.glasgow-science-centre-play-leading-role-cop26-climate-summit/>
 2. The National 29th Dec 2019 <https://www.thenational.scot/news/18126461.world-must-solve-climate-crisis-glasgow-cop26/>
 3. Energy Voice 31st Dec 2019 <https://www.energyvoice.com/otherenergy/214942/cop26-a-chance-to-show-scotland-leading-by-example-in-energy-transition/>
 4. Carbon Brief 15th Dec 2019 <https://www.carbonbrief.org/cop25-key-outcomes-agreed-at-the-un-climate-talks-in-madrid>

13 Submarines

In mid-October the government announced that production of the fourth Astute-class submarine was nearly 17 months behind schedule, a delay that is likely to impact on the timetable for building the Dreadnought-class submarines. HMS Audacious was due to be handed over to the Navy in August 2019, but due to a fault handover is now expected to be January 2021. HMS Audacious is the

fourth Astute-class submarine to be built, following HMS Astute, HMS Anson and HMS Artful, which are currently in service.

The Astute-class submarines are nuclear powered but armed with conventional weapons. They are being built by BAE Systems at Barrow-in-Furness. The Astute submarines are intended to replace the Trafalgar-class submarines, but due to delays in the Astute programme, some of the Trafalgar submarines have had their service lives extended to more than 30 years.

When questioned on the subject by the Defence Select Committee the Secretary of State for Defence, Ben Wallace, said that the fault which caused the delay was unique to HMS Audacious and had not occurred in the first three Astute submarines. It will be addressed by replacing the relevant part with one that had been intended for one of the later Astute submarines. The MoD has refused to give full details of the issue, citing security concerns. (1)

The Astute project, originally budgeted at a little over £8bn, is now officially estimated to cost nearly £11bn. Tory MP Mark Francois, a member of the defence committee in the last parliament, has described the Astute project as a “disaster”. (2)

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1. Nuclear Information Service 19th Nov 2019 <https://www.nuclearinfo.org/article/uk-fleet/astute-seventeen-month-delay-may-impede-dreadnought-programme>
 2. Guardian 17th Dec 2019 <https://www.theguardian.com/commentisfree/2019/dec/17/dominic-cummings-britain-defence-spending-mod>

14 Nuclear Convoys

Records detailing 40 safety lapses within three years on nuclear convoys prove how secure Scotland is, the Ministry of Defence has said. A Freedom of Information request has revealed convoys carrying nuclear bombs and radioactive materials have been stopped by everything from faulty windscreen wipers to brake trouble since 2016. (1)

The MoD said that none of the recorded incidents had put the public at risk. Convoys of 20 or more military vehicles transport nuclear warheads at least six times a year between the Royal Navy armaments depot at Cullinstown on Loch Long, near Glasgow, and a facility at Burghfield in Berkshire, where they are inspected and maintained. The safety failures came to light after a freedom of information request made by the SNP, which is committed to removing Trident from Faslane. The Scottish government is due to publish a report on the safety of transporting nuclear weapons by road.

Bill Kidd, the SNP MSP for Glasgow Anniesland, said: “People will be shocked to learn that Scotland’s roads are regularly being used by military convoys with nuclear warheads on board. Any one of these safety lapses is concerning, but people will be surprised these issues are so common. (2)

1. The National 30th Dec 2019 <https://www.thenational.scot/news/18127504.mod-40-nuclear-lapses-show-safe-scotland-is/>
2. Times 30th Dec 2019 <https://www.thetimes.co.uk/edition/scotland/snp-criticises-safety-lapses-in-nuclear-transport-convoy-fzjml3dv8>

15 Climate Emergency

- The NFLA has published a briefing which outlines the top 10 actions Councils need to undertake to tackle the 'climate emergency' See NFLA 16th Dec 2019 <https://www.nuclearpolicy.info/news/nfla-outlines-top-10-actions-councils-tackle-climate-emergency/>
- Midlothian Council has declared a 'Climate Emergency' with the aim of making the council's activities net-zero carbon by 2030. The council will support and work with other agencies towards making the entire area zero carbon within the same timescale and ensure that political and chief officer leadership teams embed this work in all service areas. A Citizens' Assembly will be convened to help identify how the council's activities might be made net-zero carbon and to consider the climate change impact of each area of the council's activities. Scotsman 24th Dec 2019 <https://www.scotsman.com/news/people/climate-emergency-declared-by-midlothian-council-1-5066230>
- Oxford City Council has installed what it claims is one of the UK's "largest public solar carports" at the Leys Pools and Leisure Centre, with the canopy featuring over 350 solar panels and stretching over 48 parking spaces. It is set to generate over 80,000kWh per year, costing £175k, 90% funded by the Salix Recycling Fund. Leys pools already boasts a 122kW rooftop install above the swimming pool which, when combined with the carport, will provide over 23% of the building's annual electricity needs. Solar Power Portal 23rd Dec 2019 https://www.solarpowerportal.co.uk/news/oxford_city_council_completes_one_of_uk_s_largest_solar_carports
- A citizen's assembly made up of 42 members of the public met in September and October to come up with proposals to meet Oxford City Council's new emissions goal - to make the city net zero by 2030. In response, the Council has proposed a climate emergency budget, committing more than £1m additional operational funding and £18m of capital investment to support the plans. Business Green 17th Dec 2019 <https://www.businessgreen.com/bg/news/3084710/oxford-city-council-commits-gbp19-million-to-climate-emergency>
- The "UK's most advanced solar farm", which according to its developers boasts a new commercial model and innovative technology, has been completed by Gridserve and handed over to Warrington Borough Council. The 34MW farm, which is expected to generate millions of pounds in profits every year for the council, features panels that generate power on both sides and trackers to move the panels

to face the sun all day long. It is also able to control energy flows using a lithium-ion battery storage system and two-way connection, enabling it to store electricity and achieve better power prices, as well as provide services to help National Grid balance supply and demand, including at night. Warrington Council will sell the energy on the open market to pay for local services, while a second 25MW solar farm to be built in Hull will provide the council with enough green electricity to power all its operations. Business Green 20th Dec 2019

<https://www.businessgreen.com/bg/news/3084781/cutting-edge-solar-farms-to-generate-gbp100-million-for-council>

- Cheshire West & Chester Council has announced plans to install solar panels with battery storage technology across two large estates. The £500,000 project is part of the Low Carbon Housing Support Programme and has been jointly funded by the European Regional Development Fund (ERDF). Energy Live News 12th Nov 2019
<https://www.energylivenews.com/2019/11/12/cheshire-west-chester-council-to-install-solar-plus-storage/>
- Swindon produces enough electricity to power 97% of the borough's houses from renewable sources. The council's target is to generate 200 megawatts of electricity from renewable sources, such as solar power because that is the amount needed to power every home in the town. It currently produces 195 megawatts. It hopes to have the capacity for the full 200 MW installed by next year. There are currently 43 solar farms operating in Swindon. This is Wiltshire 9th Nov 2019
<https://www.thisiswiltshire.co.uk/news/18025809.solar-power-enough-nearly-every-swindon-home/>

16 The Common Home Plan

The Common Weal think tank has published a revolutionary green new deal plan for Scotland that will cost billions of pounds and create thousands of new jobs. The most costly of the raft of proposals is the biggest overhaul of housing since the Second World War, with a plan to have greener Scottish homes by installing loft installation, double glazing and renewable technologies. That would involve setting up a national housing company and spend £40 billion to make every home in Scotland more thermally efficient, saving 40% off heating bills.

The Common Weal's plan of action would be financed through public borrowing – and it is understood it could be paid off over 50 years. It would require no additional private spending by households – while creating a carbon-neutral Scotland and future-proofing the nation for generations. The think tank says it is one of the most ambitious projects they have ever organised and consists of a “fully costed” blueprint for how to bring about a net zero Scotland – the first in the world. It will also claim that all current projections about how much of Scotland's GDP will be needed to tackle climate change are underestimates and that every year for the next 50 years Scotland will have to spend an annual amount closer to three per cent of GDP than to the two per cent often quoted. (1)

Guiding Principles:

Take responsibility to identify what can be done domestically rather than waiting for multilateral agreements.

The crisis can't be solved through market forces alone.

The time for setting targets is long gone – these tend to emphasise what it would be good to achieve, not how to achieve it.

You don't want to have to make any transformations twice. The scale of investment needed is so large it must deliver value for money for many generations.

The plan must be a once-in-many-generations fix for persistent social problems.

Above all this will transition Scotland away from a linear extractive economy to a circular participatory economy – more wealth would be retained and circulated round the domestic economy and much less exported in the form of corporate profits.

Because this is a collective task which will serve many generations, the cost should be met through low cost public borrowing paid back through progressive taxation.

The headline cost of £170bn may be a sobering figure, but it is less than double Scotland's contribution to the 2009 UK financial bailout, and will only have to be found over 25 years, and gradually repaid over 50 years. And the investment will create new revenue streams, for instance there would be a publicly-owned energy system for electricity and heating which would generate an income. The plan would create around 40,000 direct jobs. Other positive impacts would be: warmer homes, cheaper to heat; healthier food; travel faster and more efficient; quality of life would improve.

Buildings

The thermal performance of all new build houses and other buildings should be up to Passivhaus standard. (15kWh/m²/yr) But the materials used should be healthy and organic mostly sourced in Scotland.

All new houses should be ready for district heating unless they are energy neutral.

A National Housing Company should be set up to retrofit all existing houses to achieve 70 to 90% thermal efficiency. Commercial premises should be retrofitted to a similar standard. All public buildings should become energy positive.

Heating

Moving to electric heating would roughly double the load on the grid which would require significant upgrades to cope. But peak load might increase by a factor of five. While better-insulated houses would reduce the problem much of the spike would come from water heating which would not be reduced by insulation. Ground source heat pumps require a substantial land area. Air source heat pumps struggle to provide sufficient heat in the winter.

Hydrogen would have problems with leakage. All household boilers would need to be replaced. Because of the difficulty of phasing in hydrogen, boilers would probably need to be dual use. Hydrogen would probably be expensive.

Solar thermal, geothermal and industrial waste heat recovery delivered via a district heating network are probably the most viable method of heat delivery.

Heat Budget

Scotland uses around 86TWh of heating each year. Firstly, we need to reduce demand by about 40% to about 52TWh. The next step would be to make the most of solar thermal, but this would also require inter-seasonal storage. This could provide around 20TWh via district heating. Geothermal from old mines could provide another 12GWh. Biomass could also add around 6.5TWh of heat to the mix.

A Heat Supply Act could be implemented to require all developers of large waste heat sources to recover and recycle heat to feed local homes.

An Energy Development Agency would plan the shift to renewable heating; a National Energy Company would install a national district heating system and renewable heat generation infrastructure.

Electricity

Planning the future electricity generation requirements involves replacing current non-renewable electricity generation and meeting the needs for the electrification of transport and the production of hydrogen for transport and heating.

The National Energy Company would progressively take over energy supply to customers and would develop and own all future large-scale energy generating facilities. It would also generate hydrogen for energy storage.

The Scottish Energy Development Agency would plan all new capacity and have responsibility for ensuring the lights stay on while meeting the decarbonisation agenda.

Oil & Gas

The Common Home Plan says Scotland must stop extracting oil and gas. By the end of the 25-year plan Scotland will no longer be using oil and gas.

Transport

One of the biggest unknowns is the development of driverless vehicles. On call vehicles, if deployed effectively, could displace a large volume of car ownership resulting in some major changes in urban planning assumptions.

The Common Home Plan calls for the establishment of a National Transport Company which would roll out a comprehensive charging infrastructure and develop a national transport transition plan.

The Company should integrate the ability to make more journeys by foot and bike with its overall transition plan.

Scotland has around 3 million vehicles. It is generally assumed that this number will increase as population rises. Most of these would be parked in residential streets which would imply the need for charging facilities in every residential street – an enormous task. But if other transport approaches develop this could be an enormous white elephant. The National Transport Company would have to make some decisions on which way forward.

Hydrogen could become the fuel of choice for HGVs, ferries, and trains on non-electrified lines. A strategy for air travel will need to be developed.

Food and Land-Use

The plan envisages the establishment of a National Food Agency and a National Land Agency. Amongst the proposals is the suggestion that 50% of Scotland's land area should be reforested.

There are also chapters on Resources, Trade, Learning and Us. The plan calls for, for instance, a circular economy; and training for an appropriate workforce (there are only 140 plumbers being trained at the moment and yet we will need thousands to install district heating).

The Common Home Plan can be found at <https://commonweal.scot/policy-library/common-home-plan>

1. Herald 9th Nov 2019 <https://www.heraldscotland.com/news/18025538.radical-multi-billion-pound-green-plan-scotland-unveiled/>