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The Safe Energy Journal doesn't usually deal with the UK Government's proposed new reactor programme. If the new reactor programme is your main interest you should watch out for our other newsletter here: <http://www.no2nuclearpower.org.uk/nuclear-news/>

1 Hunterston and Torness

BEIS announced improved agreement on eventual decommissioning of EDF Energy's fleet of 7 Advanced Gas-cooled Reactors (AGRs) including Hunterston B and Torness.

Decommissioning of the AGRs will become the responsibility of the NDA once they have been defueled by EDF Energy. The AGRs will sit within the Magnox subsidiary when transferred. The deal negotiated between BEIS and EDF Energy is estimated to generate a £1bn saving to UK taxpayer.

Under previous arrangements, EDF was responsible for the full defueling and deconstruction of the AGR stations, using funding provided by the Nuclear Liabilities Fund (NLF), a segregated fund managed by trustees and underwritten by Government. EDF's AGR defueling and decommissioning work will continue to be funded by the NLF.

To facilitate these revised arrangements, Designation Directions have been laid in Westminster and jointly with Scottish Ministers in Holyrood (for Scottish Stations) which provide the appropriate vires for the NDA to undertake their pre-transfer work and obligations on these stations. (1)

The NDA told the Scottish Nuclear Sites meeting that it had commissioned a report on an Economic Impact Assessment of the closure of Hunterston B.

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1. Written Statement by Anne-Marie Trevelyan 23rd June 2021 <https://questions-statements.parliament.uk/written-statements/detail/2021-06-23/hcws114>

2 Dounreay

Construction of Dounreay's new shielded Intermediate Level Waste store has taken another step forward with the installation of a huge steel door. Measuring 24 metres wide and three metres high, it has been made locally by contractors JGC Engineering and Technical Services Ltd and Grahams.

The door is one of three that are described as essential features of the building. It will span the width of the store and, when closed, will safely segregate the remotely operated overhead travelling crane within the crane maintenance bay. Once it is filled with concrete to provide shielding the door will weigh a colossal 180 tonnes. The waste will be kept in long-term storage in the building in accordance with Scottish Government policy. (1)

US engineering company, Jacobs, which employs more than 1,000 people in Scotland, has won contracts worth around \$16 million (£11.5m) in total to support decommissioning work at the Dounreay. Jacobs has been engaged to upgrade the ventilation systems for the Prototype Fast Reactor (PFR). It will also develop the decommissioning strategy for a plant in which spent fuel from experimental UK reactors was reprocessed. (2)

One of the most significant hazards at Dounreay has been removed in a 40-hour operation, using cutting-edge tools designed and made in Caithness. Around 1810 litres of radioactive sodium coolant (some 1.7 tonnes) remaining in a “heel” pool at the base of the reactor vessel in the Prototype Fast Reactor (PFR) has been pumped out. It paves the way for the next step in the decommissioning of PFR to take place. (3)

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1. John O Groat Journal 13th Aug 2021 <https://www.johnogroat-journal.co.uk/news/huge-steel-door-installed-in-dounreays-new-shielded-radioac-247707/> and NDA 12th Aug 2021 <https://www.gov.uk/government/news/door-installation-is-key-to-progress-of-dounreay-radioactive-waste-store>
 2. World Nuclear News 4th Aug 2021 <https://www.world-nuclear-news.org/Articles/Jacobs-awarded-Dounreay-decommissioning-contracts>
 3. John O’Groat Journal 19th July 2021 <https://www.johnogroat-journal.co.uk/news/significant-hazard-reduction-at-dounreay-is-made-in-caithne-244900/> and NDA 16th July 2021 <https://www.gov.uk/government/news/world-first-process-achieves-significant-hazard-reduction-at-dounreay>

3 Vulcan

Work to decontaminate and dismantle the nuclear submarine test base at Vulcan, near Thurso, which had been due to start next year, has been delayed by three years, because of a “change in the scope of work”. Vulcan programme manager Wendy Newton has now confirmed the clean-up programme has been extended to the end of 2025. In a letter to Dounreay Stakeholder Group, Mrs Newton makes clear that during this time, the site will continue to be run by Rolls-Royce.

The plug was pulled on Vulcan’s pressurised water reactor in 2015 since when the main focus has been to remove the stockpile of nuclear fuel. Vulcan played a key role in support of the UK’s nuclear submarine programme for 50 years.

Press and Journal 11th August 2021 <https://www.pressandjournal.co.uk/fp/news/highlands/3380602/clean-up-of-vulcan-nuclear-submarine-test-base-delayed/>

4 Nuclear Police

A UK Government plan to give the armed Civil Nuclear Constabulary (CNC) greater powers has raised “profound concerns” and been described as “deeply worrying”. The CNC is a specialist force tasked with protecting civil nuclear sites in Scotland, England and Wales and nuclear materials in transit both in the UK and internationally. Counter-terrorism is a major part of its policing and the force employs 1,500 police officers.

The CNC guards nuclear sites at Torness, Hunterston and Dounreay in Scotland, among other places across the UK. Its remit is set out in the Energy Act 2004 but the UK Government has just held a consultation seeking views on a plan to expand and diversify the force’s role.

Anti-nuclear groups have voiced fears over the proposal, however, arguing that the CNC’s remit should be limited to civil nuclear sites. The Scottish Greens said that centralised control over an armed police force with new powers would be a “very concerning development”. The CNC said in reply it plays an “important national counter-terrorist role” and provides armed support to territorial police forces across the UK. David Mackenzie, assistant secretary at Scottish CND, said any extension of police powers “*must be treated with suspicion and exacting scrutiny*”. He added: “*In Scotland we have already seen problems arising from the 2001 extension of the jurisdiction of the Ministry of Defence Police, which has led to difficulties around the policing of protest at the Faslane/Coulport nuclear weapon complex.*”

The UK Government’s plan would enable the CNC to “provide a wider range of policing services beyond the civil nuclear sector” and “provide support more easily to other police forces”.

The consultation paper said: “*In light of the evolving national security and energy landscape, we want to ensure that we are making best use of our resources to protect the UK’s critical national infrastructure. This will ensure that, should a need arise in the future, the constabulary can utilise their expertise in deterrence and armed response to support other critical infrastructure sites, as well as assist other police forces in an emergency.*”

The NFLA submitted a joint response to the consultation with anti-nuclear groups – Blackwater Against New Nuclear Group, Together Against Sizewell C, CADNO, People Against Wylfa B, Stop Hinkley and Nuclear Waste Advisory Associates. Councillor David Blackburn said. “*The proposals in this consultation move the CNC further into being an extensively armed police force, when we should instead be looking at ways to have a democratically controlled and accountable police force protecting the public in a measured way.*”

The Ferret 23rd Aug 2021 <https://theferret.scot/uk-government-plan-to-give-armed-police-more-powers/>

The NFLA and joint groups response is available here: https://www.nuclearpolicy.info/wp/wp-content/uploads/2021/08/A332_NB218_Response_on_the_CNC.pdf

5 Nuclear Waste Management and Decommissioning Policy Review

The UK Department for Business, Energy and Industrial Strategy (BEIS) has continued to work with the Scottish Government on the development of a policy review on managing radioactive substances and nuclear decommissioning. The Scottish Government has provided comments and input to the process. The timing of the publication of the consultation was moved back to account for elections in Scotland and Wales and is now likely to be some time after the parliamentary summer recesses.

There will be a single consultation document for the UK, but with two distinct parts. Part I will focus on consultation proposals: in particular it will set out proposals for near surface disposal of Intermediate Level Waste (ILW) in England and Wales. Part II will be a draft of the policy framework as it would appear if the consultation proposals were implemented.

The review aims to replace a white paper (Cmd 2919) published in 1995. (1)

This was the White Paper that said, inter alia:

- spent fuel should not be categorised as waste, while the option of reprocessing remained.
- decisions on the siting of dry stores for spent nuclear fuel should be a matter for the commercial judgement of the operators.
- although the programme of geological studies relating to the disposal of High-Level Waste (HLW) deep underground was discontinued in 1981, the Government is developing and implement the necessary research strategy for the UK. (Nirex had submitted its planning application for its so-called Rock-Characterisation Facility at Sellafield in 1994, as part of the process to find an ILW repository, but HLW was not included).
- The UK's strategy for decommissioning nuclear power stations at the time was that it should be done in three stages - defuelling immediately on shutdown; dismantling buildings external to the reactor shield 5-10 years later; and demolishing the reactor itself 100 years after shutdown. The Government believes that, in general, the process of decommissioning nuclear plants should be undertaken as soon as it is reasonably practicable to do so, taking account of all relevant factors.

Meanwhile, the Scottish Government is continuing with its ten-year review of its Higher Activity Waste Implementation Policy. Higher Activity Waste encompasses High Level and Intermediate Level Waste, but there is no High Level Waste in Scotland. It is quite possible, given the end of reprocessing, that spent fuel could be reclassified as waste. It will be interesting to see how the Scottish Government squares the circle of keeping higher active waste near site and near surface, and continuing to send spent fuel from Hunterston and Torness to Sellafield.

(1) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/829274/review-radioactive-waste-management-policy-cm2919.pdf

6 Committee on Radioactive Waste Management

CoRWM published its 17th Annual Report in July:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000520/corwm-17th-annual-report-2021.pdf

This highlighted a policy paper issued in May called “Policy, Legal and Regulatory Issues for a GDF and Associated Radioactive Waste Management Issues. This recommended:

“As a matter of urgency, a clear statement of Government policy on matters relevant to a GDF, near-surface disposal (NSD) and other issues relevant to radioactive waste management in England and Wales needs to be produced, preferably in a single, accessible document. It should recognise, address and explain any implications of the different policy which applies in Scotland.”

*“It should also provide clarity as to the relationship to the UK radioactive waste inventory, including materials not currently classified as waste, but which in one form or another will be disposed of in a GDF but which in one form or another will be disposed of in a GDF. The **policy statement should be subjected to rigorous scrutiny and public debate**, given the very long term environmental, health and safety implications.”* [emphasis added]

The report makes the interesting observation that although there is renewed interest in near surface disposal of suitable ILW waste streams in England and Wales, this shouldn't be confused with the Scottish policy which is for “near site, near surface long term management of such radioactive wastes rather than disposal in a GDF.”

It continues:

“A related issue which requires clarity is the disposal of higher activity waste (HAW) of Scottish provenance in a GDF, where such material is unsuitable for NSD [Near Surface Disposal] in accordance with Scottish Government policy. It is foreseeable that Scottish standards and requirements on radioactive waste management may diverge increasingly from those in other parts of the UK.”

A GDF under the seabed?

Now that the search for a site for a Geological Disposal Facility has begun again in earnest south of the border (see https://www.nuclearpolicy.info/wp/wp-content/uploads/2021/03/Rad_Waste_Brfg_86_GDF_and_Cumbria_coal_mine.pdf) it is clear that building a GDF under the seabed, but accessed from land, (sometimes referred to as “inshore”) may be an option considered, though it would present different challenges in terms of site investigation. Such an option will have a wider international dimension with interests from, for example, The Republic of Ireland, Northern Ireland, the Isle of Man, Scotland and Wales, France, Scandinavian states, and the EU needing to be considered as well as other nations and interest groups which may have a view on a facility in the marine environment.

In the event that a GDF is sited under the seabed, CoRWM says there will be a need for careful review of the implications for operation of these systems and their relationship to, for example, marine licensing. CoRWM says it is actively involved in offering a view and developing its position on sub-seabed disposal. If it's a real prospect, attention needs to be given now to the regulatory implications of this, including public international law aspects as well as regulatory implications within the UK. CoRWM is considering this topic as a discrete issue.

CoRWM POSITION PAPER: Policy, Legal and Regulatory Issues for a GDF and Associated Radioactive Waste Management Issues, CoRWM April 2021.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/984531/policy-legal-regulatory-issues-for-gdf.pdf

- CoRWM is due to hold a plenary meeting in Edinburgh on 23rd November.

7 NDA Sustainability Report

NDA has published its first ever Sustainability Report, covering 2020/211. The report is for the whole NDA Group and sets out performance and examples of good practice across a wide range of economic, social and environmental issues.

It includes some interesting facts such as:

- Chapelcross represents one of the NDA's largest land holdings at approximately 200 hectares. The NDA and Magnox are partners with Dumfries and Galloway Council, Scottish Enterprise and The Scottish Government in developing an ambitious vision for the site with the potential for renewable energy a central feature.
- Magnox and Scottish Water are planning to install an eel and lamprey passage on Milnby Weir, formerly used by the Chapelcross site to abstract water from the River Annan.
- The NDA group is focused on taking action to reduce carbon emissions. It will be looking at the role renewables can play in its future.
- The NDA owns many pieces of land with infrastructure connecting them to the National Grid. It has recently completed an access agreement to link the grid connection at Chapelcross site to the Solway Bank Wind Farm.
- The Dounreay Socio Economic Alliance works alongside Caithness & North Sutherland Regeneration Partnership (CNSRP) to support the creation of sustainable alternative employment.

Unfortunately, Hunterston doesn't get a single mention in the report.

Sustainability at the NDA 2020/2021, <https://www.gov.uk/government/publications/nda-sustainability-report-financial-year-april-2020-to-march-2021>

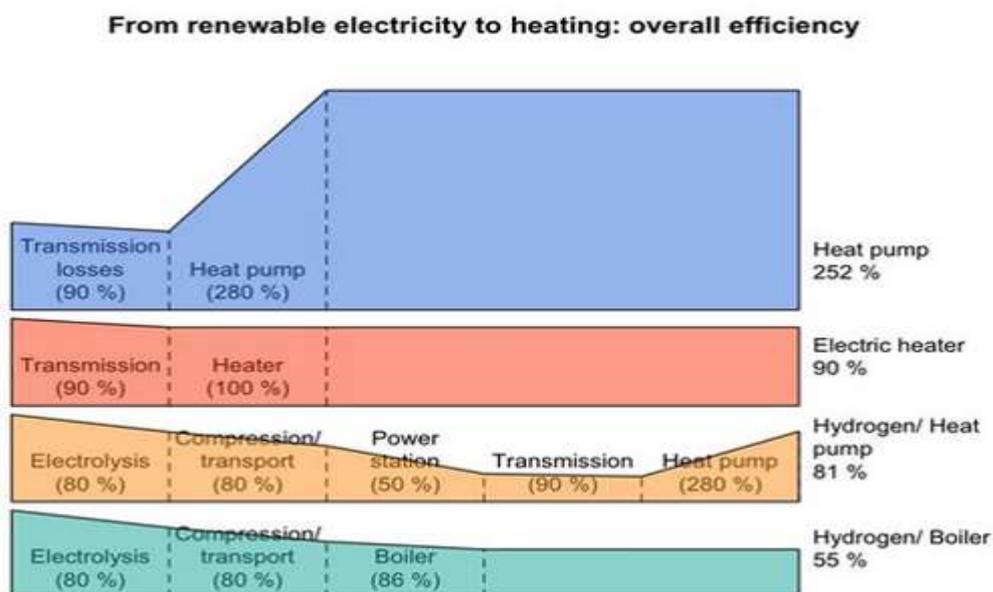
8 UK Hydrogen Strategy

The UK government has launched its Hydrogen Strategy (1) which it says is a plan for a world-leading hydrogen economy to drive forward the Prime Minister's ambitions in his 10 Point Plan for a green industrial revolution, support over 9,000 UK jobs, and unlock £4 billion investment by 2030.

Although hydrogen will undoubtedly have an important role in tackling climate change, there are serious doubts about the strategy in three main areas. Firstly, because of efficiency losses during its manufacture there concerns about the efficiency and economics of using it for more than just a few areas which are difficult to electrify. There are particular concerns that waiting for hydrogen to be available to the domestic market could delay the decarbonisation of domestic heating. Secondly, the strategy will support both hydrogen made from renewable electricity and hydrogen made from fossil gas. Even using carbon capture and storage this second type of hydrogen could continue to cause unacceptable levels of carbon emissions. And finally, there are concerns about how the strategy might be paid for, with a levy on gas consumers mooted as one possible mechanism.

Efficiency Losses

Dr Dave Toke, reader in energy politics at Aberdeen University says even if hydrogen was sourced from renewable energy the result would be a grandiose waste of renewable electricity. This is because using hydrogen from renewable energy to heat buildings is around four times less energy efficient compared to using heat pumps (using renewable electricity) to supply heating in buildings.



nicola.qeng-ho.org/resources/pathways-to-zero-carbon.pdf

On the one hand the electrolysis process by which renewable energy is converted to hydrogen is only 80% efficient. That is bad enough since using renewable electricity to supply heating would not involve these losses. However, things get a lot worse when you realise that the best way of supplying heating in efficiency terms is through electrically powered heat pumps. Heat pumps multiply the heat from the electricity by around threefold (by using heat in the surrounding environment) and avoid losing energy through electrolysis. So, in terms of reducing carbon emissions we will need

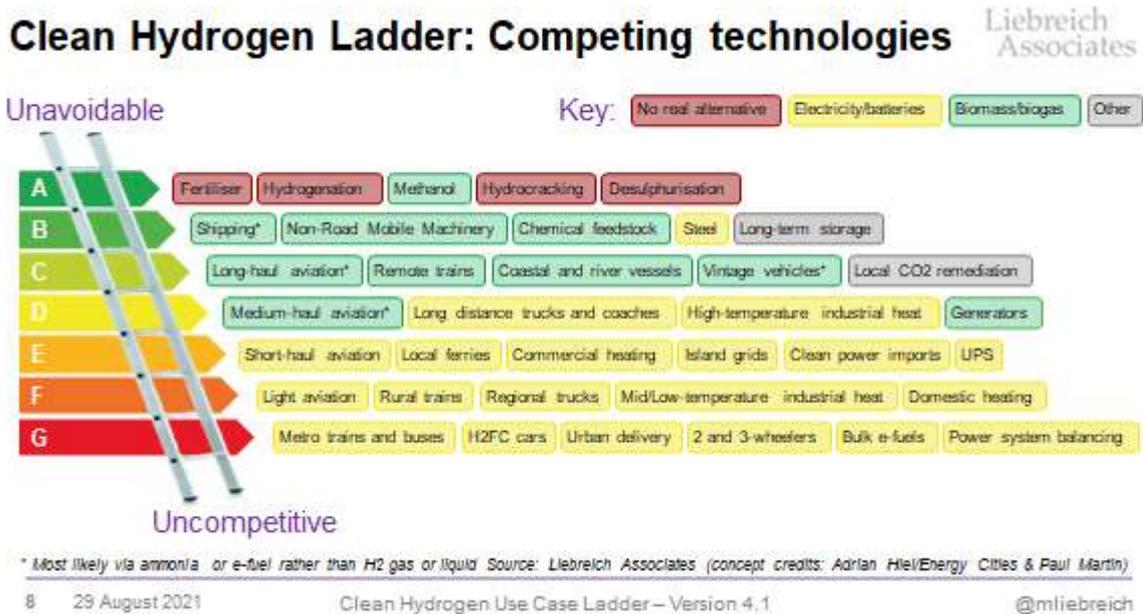
FOUR times the amount of renewable energy to produce the same heating effect in buildings if we turn it into hydrogen - compared to using the renewable energy delivered through the electricity system and used in heat pumps.

If the hydrogen is manufactured using fossil gas, there will be efficiency losses when the methane gas is converted to hydrogen and efficiency losses due to the carbon capture process. The efficiency of the gas reformation process is only around 65 per cent meaning that much more carbon dioxide is generated to produce the hydrogen as fuel compared to simply burning the natural gas. Toke 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.”* (2)

This is not to say that hydrogen won't be an important part of the UK's transition to a net zero economy. But its use needs to be restricted to those parts of the economy where electrification is going to be difficult.

Jess Ralston of the Energy and Climate Intelligence Unit questions whether the Government has a full understanding of the areas most appropriate for hydrogen use. She says it should be prioritised for sectors which are hard to decarbonise through other means, such as aviation and steel-making.

Michael Liebreich's Hydrogen Ladder highlights those areas where hydrogen would be most useful and those areas where it would be uncompetitive. (3)



The Government's Hydrogen Strategy aims for 5GW of hydrogen capacity by 2030. David Cebon, professor of Mechanical Engineering at the University of Cambridge, points out that this is *“a toe in the water”* compared to what the country would need to decarbonise key industries. It's nothing like the amount the country needs for fertiliser and steel. So, there is plenty more to do just to produce enough hydrogen to decarbonise difficult to electrify areas. (4)

Dr Jan Rosenow says Government analysis, included in the strategy, suggests potential hydrogen demand of up to 38 terawatt-hours (TWh) by 2030, not including blending it into the gas grid, and rising to 55-165TWh by 2035. This is in line with the CCC's recommendation for its net-zero pathway, which sees low-carbon hydrogen scaling up to 90TWh by 2035 – around a third of the size of the current power sector. The committee emphasises that hydrogen use should be restricted to “*areas less suited to electrification, particularly shipping and parts of industry*” and providing flexibility to the power system. The CCC does not see extensive use of hydrogen outside of these limited cases by 2035.

This makes it all the more irksome that the press release launching the hydrogen strategy talked about replacing natural gas in powering around 3 million UK homes each year as well as powering transport and businesses, particularly heavy industry. (5) Jan Rosenow of the Regulatory Assistance Project points out that the 3 million households figure is misleading. BEIS is actually expecting less than 70,000 homes to use hydrogen for heating by 2030. Many of the press reports, including the Guardian were misled by the BEIS press release. As the strategy admits, there won't be significant quantities of low carbon hydrogen for some time, so we need to use it where there are few alternatives and not as a like-for-like replacement of gas. (6) This means that “*hydrogen for heating our homes will not play a significant role before 2030 ... But we cannot wait until 2030 before bringing down emissions from heating. The urgency of the climate crisis requires bold policy action now.*” (7)

Blue vs Green Hydrogen

There are two main types of hydrogen. Green hydrogen is made by splitting water into hydrogen and oxygen using electrolysis, with the necessary electricity provided by renewable sources, whereas blue hydrogen is produced from natural gas, producing carbon dioxide in the process. In future carbon capture and storage will, hopefully, be included. BEIS says it will take a “twin-track” approach, supporting both green and blue hydrogen. The strategy commits BEIS to reviewing the development support needed to grow the hydrogen storage sector and to trialling 20% hydrogen blends in the existing gas supply. At present, blending is limited to 23%. Beyond this point, infrastructure and appliances will likely need to be upgraded

Doug Parr, the chief scientist for Greenpeace UK, warned that producing large quantities of hydrogen from fossil gas would lock the UK “into costly infrastructure that is expensive and ... may be higher carbon than just burning the gas”. Dan McGrail, the chief executive of RenewableUK, said the national strategy “doesn't focus nearly enough on developing the UK's world-leading green hydrogen industry” and should “set out a clear ambition for green hydrogen”. “We're urging the government to set a target of 5GW of renewable hydrogen electrolyser capacity by 2030 as well as setting out a roadmap to get us there, to show greater leadership on tackling climate change,” he said. (8)

A study by academics at Cornell and Stanford universities in the US, warned that blue hydrogen could be up to 20% worse for the climate than fossil gas owing to the emissions that escape during its production, multiplied by the amount of gas required to make the equivalent amount of energy from hydrogen. (9) This study was attacked, and not just by the gas industry, as being an exaggeration. But an analysis by Friends of the Earth Scotland for the Guardian, based on

government data published in the Hydrogen Strategy said that using blue hydrogen exclusively to replace fossil gas would result in between 6m and 8m tonnes of carbon dioxide emissions every year from the late 2020s, or the equivalent of running an average of 1.5m more fossil-fuel cars on the road every year by 2050. (10)

The chairman of a leading hydrogen industry association has resigned so he can speak out against widespread efforts to keep producing the gas from fossil fuels. Christopher Jackson said he would be *“betraying future generations by remaining silent”*. He described blue hydrogen as the wrong answer to climate change. (11)

It is impossible to capture all the carbon during the manufacture of blue hydrogen and even if you did, there is always some methane leakage at the gas well and on the way to the processing plants. Methane is a major greenhouse gas, with a global warming potential 56 times that of CO₂ over 20 years. Estimates of the GHG emissions of blue hydrogen are about half that of natural gas. Some estimates are more favourable – about a third. So, taking the blue hydrogen route only reduces emissions by two thirds, at best. (12)

But Prof Robert Gross, director of the UK Energy Research Centre says it is *“probably a bit unhelpful to get too preoccupied with the green vs blue hydrogen debate”*. He says: *“If we want to demonstrate, trial, begin to commercialise and then roll out the use of hydrogen in industry/air travel/freight or wherever, then we need enough hydrogen. We can’t wait until the supply side deliberations are complete.”* (13)

Green purists are waging guerrilla warfare against Britain’s “blue” hydrogen plan, deeming it a sell-out to the fossil industry, a licence to pollute forever, and an unforgivable environmental fraud on the eve of the COP26 summit. The best is the enemy of the good, says Ambrose Evans-Pritchard writing in The Telegraph. He says the cost of producing “blue” is roughly \$2.50 a kilo compared to \$6 for “green” which is why blue hydrogen should be used as a “bridge fuel” out to the 2030s. *“Green hydrogen is going to win out in the long run on pure economics but blue works for now so long as you meet two conditions: a 95pc capture rate; and rigorous certification of where the gas came from,”* said Lord Adair Turner, chairman of the Energy Transitions Commission. (14)

Who will pay for hydrogen?

The Government says it will spend an initial £100m to kick-start the industry (15), but the plans remain dogged by uncertainty over how the government will determine a fair subsidy for the multibillion-pound projects and whether the cost will be shouldered through household bills or by the Treasury. It’s possible that the Government will decide to fund it by placing a levy on consumers’ gas bills. Juliet Phillips at think tank E3G, said there is a risk that gas consumers will end up paying for something which is only used in a few industrial clusters. For instance if the 5GW of hydrogen end up being used by the fertiliser and steel industry, why should gas consumers pay for that. (16)

- ScottishPower has narrowed down the locations it’s considering for its 35MW electrolyser site, with the Cromarty Firth identified as “ideal”. The green hydrogen hub could supply distilleries in the region for heating and the processes in making whisky. ScottishPower has also submitted a planning application for a 20MW electrolyser just 5km west of Lochgoin

Reservoir to utilise power from the country's largest onshore wind farm, Whitelee, as well as 40MW of solar and 50MW of battery storage that will be developed as part of the project. (17)

- SSE has signed a Memorandum of Understanding with Siemens Gamesa Renewable Energy to explore the delivery of green hydrogen at two as yet unspecified sites through electrolysis. (18)
1. BEIS 17th Aug 2021 <https://www.gov.uk/government/news/uk-government-launches-plan-for-a-world-leading-hydrogen-economy>
 2. Dave Toke's Blog 4th Jan 2020 <https://realfeed-intariffs.blogspot.com/2020/01/why-uk-government-may-be-encouraging.html>
 3. See <https://twitter.com/MLiebreich/status/1431990003144531969/photo/1>
 4. Telegraph 17th Aug 2021 <https://www.telegraph.co.uk/business/2021/08/16/billions-funnelled-hydrogen-subsidies-uk-races-hit-net-zero/>
 5. BEIS 17th Aug 2021 <https://www.gov.uk/government/news/uk-government-launches-plan-for-a-world-leading-hydrogen-economy>
 6. See <https://twitter.com/janrosenow/status/1427512726985879553>
 7. BBC 17th Aug 2021 <https://www.bbc.co.uk/news/science-environment-58238367>
 8. Guardian 17th Aug 2021 <https://www.theguardian.com/environment/2021/aug/17/uk-homes-low-carbon-hydrogen-economy-jobs>
 9. Edie 12th Aug 2021 <https://www.edie.net/news/8/Blue-hydrogen-could-produce-more-emissions-than-burning-natural-gas--academic-study-finds/>
 10. Guardian 22nd Aug 2021 <https://www.theguardian.com/environment/2021/aug/22/uk-switch-to-hydrogen-power-must-not-rely-on-fossil-fuels-warn-campaigners>
 11. Telegraph 18th Aug 2021 <https://www.telegraph.co.uk/business/2021/08/18/hydrogen-lobby-boss-quits-row-fossil-fuels/>
 12. See http://www.gshp.org.uk/The_Hydrogen_Distraction.html
 13. Carbon Brief 17th Aug 2021 <https://www.carbonbrief.org/in-depth-qa-how-will-the-uks-hydrogen-strategy-help-achieve-net-zero>
 14. Telegraph 25th Aug 2021 <https://www.telegraph.co.uk/business/2021/08/25/boris-right-britain-has-beautiful-competitive-advantage-blue/>
 15. BEIS 17th Aug 2021 <https://www.gov.uk/government/news/uk-government-launches-plan-for-a-world-leading-hydrogen-economy>
 16. Telegraph 17th Aug 2021 <https://www.telegraph.co.uk/environment/2021/08/16/energy-bills-could-soar-green-gas-hydrogen-homes-plan/>
 17. Current 26th July 2021 <https://www.current-news.co.uk/news/scottishpower-eyes-the-cromarty-firth-for-35mw-green-hydrogen-site>
 18. Herald 27th July 2021 https://www.heraldscotland.com/business_hq/19470270.scottish-energy-giant-unveils-green-hydrogen-plans/

9 Climate Change

The Earth is expected to hit the critical threshold of 1.5°C warming due to climate change within the next 20 years, regardless of how deeply global governments cut greenhouse gas emissions under all five scenarios considered by a landmark scientific report from the Intergovernmental Panel on Climate Change (IPCC).

This year has already seen deadly floods, hurricanes and heatwaves, from Canada to Europe and China. Climate change is not a problem of the future, it's here and now, and affecting every region of the world.

In the worst of five scenarios detailing how future global emissions may play out, the world faces a catastrophic 4.4°C average temperature rise by 2100, the IPCC concluded. Under all five scenarios, in the next two decades warming reaches or exceeds the 1.5°C goal of the 2015 Paris Agreement, which also set a weaker goal of holding warming to 2°C. (1)

The report finds that *"it is more likely than not"* that the world will reach 1.5C sometime between 2021 and 2040. Immediate, rapid and large-scale cuts to greenhouse gas emissions are needed to keep these climate goals within our grasp, the report says. (2)

Although the most ambitious scenario, with emissions cut to net zero and removed from the atmosphere, would see warming later fall back to 1.4°C by 2100, some of the impacts, such as global sea level rise, could be *"irreversible for centuries to millennia"*. And tipping points in Earth's climate – thresholds where a small change could lead to dramatic change – *"can't be ruled out"*. Such tipping points could include ice-sheet collapse or abrupt changes to ocean circulation patterns, it adds. (3)

A rise in sea levels of nearly two metres by the end of this century *"cannot be ruled out"*. (4)

Only rapid and drastic reductions in greenhouse gases in this decade can prevent climate breakdown, with every fraction of a degree of further heating likely to compound the accelerating effects, according to the Intergovernmental Panel on Climate Change, the world's leading authority on climate science. Every nation must come to Cop26 with fresh plans to reduce greenhouse gas emissions to a level that will limit global heating to no more than 1.5C above pre-industrial levels, as the IPCC emphasised this goal was still possible, but only just.

António Guterres, the UN secretary general, warned: *"[This report] is a code red for humanity. The alarm bells are deafening, and the evidence is irrefutable: greenhouse gas emissions from fossil fuel burning and deforestation are choking our planet and putting billions of people at immediate risk."*

He called for an end to new coal plants and to new fossil fuel exploration and development, and for governments, investors and businesses to pour all their efforts into a low-carbon future. *"This report must sound a death knell for coal and fossil fuels, before they destroy our planet,"* he said. (5)

Scientists and campaigners said plans to continue fossil fuel exploration were not compatible with the lowest-emission pathways necessary to have any hope of meeting the 1.5C target. Dr Michael Byrne, a lecturer in earth & environmental sciences at the University of St Andrews and a

contributing author to the report, said the 2050 net zero target was “*not fast enough*” and it should be moved forward to 2040. He added: “*We need to be reducing rather than increasing our carbon emissions, so things like new coal mines are going in the wrong direction.*” (6)

In 2015, about 40 gigatonnes — or 40 billion metric tons — of carbon dioxide were emitted. This would need to be halved to 20 gigatonnes by about 2035 and to zero in the early 2050s under the best case scenario. Under the worst-case scenario it would increase to 60 gigatonnes by the late 2030s and to 80 gigatonnes by 2050. In the best-case scenario, the global average temperature would rise to 1.6C but by 2100 would have fallen back to 1.4C above the level seen between 1850 and 1900. On our current trajectory, the temperature will increase to between 2.7C and 3.6C above pre-industrial levels, and under the worst case scenario may rise 4.4C by the end of the century. (7)

Patrick Vallance, the UK government chief scientific adviser, says “*The IPCC report is clear: nothing short of transforming society will avert catastrophe.*” (8) Clare Farrell, an XR co-founder, said “*This government is a joke, telling us how to wash our dishes when they should be leading the world towards a mobilisation that saves humanity.*” (9)

For an in-depth look see Carbon Brief 8th Aug 2021 <https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-report-on-climate-science>

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1. New Scientist 9th Aug 2021 <https://www.newscientist.com/article/2286454-earth-will-hit-1-5c-climate-limit-within-20-years-says-ipcc-report/>
 2. Independent 9th Aug 2021 <https://www.independent.co.uk/climate-change/news/ipcc-report-2021-summary-climate-b1899189.html>
 3. Independent 9th Aug 2021 <https://www.independent.co.uk/climate-change/news/ipcc-report-2021-climate-un-b1899193.html>
 4. iNews 9th Aug 2021 <https://inews.co.uk/news/environment/climate-change-report-un-ipcc-global-warming-limit-hit-20-years-1141586>
 5. Guardian 9th Aug 2021 <https://www.theguardian.com/science/2021/aug/09/humans-have-caused-unprecedented-and-irreversible-change-to-climate-scientists-warn>
 6. Telegraph 9th Aug 2021 <https://www.telegraph.co.uk/environment/2021/08/09/paris-15c-climate-goal-set-breached-within-two-decades/>
 7. Times 9th Aug 2021 <https://www.thetimes.co.uk/article/ipcc-climate-change-report-a-wake-up-call-for-the-world-l73clz7nf>
 8. Guardian 9th Aug 2021 <https://www.theguardian.com/commentisfree/2021/aug/09/ipcc-report-transforming-society-avert-catastrophe-net-zero>
 9. Guardian 9th Aug 2021 <https://www.theguardian.com/politics/2021/aug/09/boris-johnson-ipcc-climate-report-makes-sobering-reading>

10 Bute House Agreement

The Bute House Agreement (See <https://tinyurl.com/f5awk6e7>) between the Scottish Government and the Scottish Green Party includes measures to help decarbonise some of Scotland's most-emitting sectors, including energy, transport and buildings.

There are commitments to launch a £500m Just Transition Fund for the North East and Moray, to be spent over a ten-year period. The aim of the Fund is to protect those who will be most affected by Scotland's transition to net-zero by 2045, such as oil and gas workers.

The Agreement also binds the Government to invest at least £1.8bn in energy efficiency and renewable energy for heat this parliamentary session; to revise the framework of support for the offshore wind, wave and tidal energy sectors and to increase investment in active travel and public transport. The Agreement wants to see at least 1 million homes and at least 50,000 non-domestic buildings using zero emission heating systems instead of fossil fuel boilers by 2030. At least £400 million will be spent over this parliamentary session in heat and energy efficiency projects, including providing support for zero carbon local and district heat networks, including large scale heat pumps. There will also be a consultation on reforms for Energy Performance Certificates to better align them to net-zero.

There are also measures to improve nature, including a review of the marine environmental protection framework and a commitment to designate at least one new National Park. Both of these actions should be taken this parliamentary session. (1)

Solar PV is also included in the policy document, but it falls well short of Solar Energy Scotland's call for 4-6 GW of photovoltaics to be installed by 2020. While the paper outlines an ambition for 8-10 GW of onshore wind farms by 2030 – albeit “subject to consultation” – on top of the existing goal of 11 GW of offshore facilities, solar is mentioned only as having “an important role in continuing to decarbonize our heat and electricity supply.” A section of the policy document devoted to the national planning system out to 2050 merely states an aim to “enable renewable energy, including solar power.” (2)

On transport the agreement says the Government will align transport policy with climate targets and the goal of reducing car/km by 20% by 2030 and increase the proportion of Transport Scotland's budget spent on Active Travel initiatives so that by 2024-25 at least £320m or 10% of the total transport budget will be allocated to active travel.

Friends of the Earth Scotland welcomed most of the agreement but said on carbon capture and hydrogen made from gas, the agreement is a disappointing compromise.

“... it's disappointing that the agreement doesn't simply rule out new development [of oil and gas] as recommended by the International Energy Agency, and this should be a starting point for a review. The negotiations have clearly been difficult but the proposed review could be a game changer. However, any review of the future of oil and gas needs to be independent of government, with the right remit and the right experts contributing. If it's done right it cannot fail to conclude that we need to phase out oil and gas extraction in short order. “There is a disappointing compromise on CCS and

hydrogen from fossil fuels. The Greens will need to use the caveat that these ‘cannot be used to justify unsustainable levels of fossil fuel extraction’ to argue for the right priorities for hydrogen from renewables and push the case against hydrogen from gas.” (3)

Shortly after the Bute House Agreement was published, the Scottish Government announced that it has convened a new group of advisors to guide policymaking on environmental issues. The SNP had promised to take this action within the first 100 days of this government, in its most recent election campaign. Sir Ian Boyd, former chief scientific advisor to the UK Government’s Department for Food, the Environment and Rural Affairs (Defra), has been selected as co-chair of the new advisory group. Sturgeon will be the second co-chair. Other members of the group include Dame Julia Slingo, former chief scientist at the Met Office, circular economy advocate Dame Ellen Macarthur and wildlife presenter Gordon Buchanan. There are 14 members altogether. (4)



The Common Weal Energy Working Group (with support from Douglas Chapman MP and his team) has come up with a list of 21 priority areas for action for Scotland. These are as follows:

1. Build a Green New Deal;
2. Start our own energy company;
3. Plan our energy future;
4. Build what we need in the right way – By establishing a National Infrastructure Company we can ensure that the infrastructure we need is built to the highest standard and owned by the public;
5. Leave no-one without a warm house;
6. Capture waste heat and use it;
7. Future-proof the electricity grid;



8. Fair connection charges for Scotland's power;
9. End coal, end nuclear;
10. No new oil;
11. Train a renewables workforce;
12. Back a green hydrogen road-map;
13. Make energy efficiency meaningful;
14. Measure the whole-life energy of houses;
15. Energy-efficient appliances only;
16. Make localism work – Prioritising localism has enormous energy-saving benefits so make all neighbourhoods '20-minute neighbourhoods';
17. Set a legal right to homeworking;
18. Fewer cruise ships;
19. Explore a flights quota;
20. Divest from fossil fuel;
21. Clean politics – End the influence fossil fuel lobbyists have over our politics by signing up to the Fossil Free Politics campaign. (5)

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1. Edie 23rd Aug 2021 <https://www.edie.net/news/11/Scottish-Government-draws-up-plan-for-green-recovery-from-Covid-19/>
 2. PV Magazine 23rd Aug 2021 <https://www.pv-magazine.com/2021/08/23/scotland-includes-solar-in-commitments-after-greens-power-sharing-agreement/>
 3. FoE Scotland 20th Aug 2021 <https://foe.scot/press-release/deal-between-the-snp-and-the-greens-will-lead-to-stronger-action-for-the-climate/>
 4. Edie 23rd Aug 2021 <https://www.edie.net/news/11/Scottish-Government-draws-up-plan-for-green-recovery-from-Covid-19/>
 5. Commonweal 9th Aug 2021 <https://commonweal.scot/policies/21-for-21/>

11 Renewable Notes

- The 48MW Kincardine Offshore Wind farm has been completed off the coast of Aberdeenshire, and classed by the American Bureau of Shipping (ABS) as the world's largest floating offshore wind farm. (1)
- Crown Estate Scotland has confirmed that all 15 areas in the country's waters which were designated by the Scottish Government as potential offshore wind sites have received applications in a recent auction. It was part of the ScotWind leasing process, which asked developers to bid for rights to build projects on parts of Scotland's seabed. A total of 74 applications were received for the 15 sites. Crown Estate Scotland said there is now a target of making initial offers for the first option agreements to successful applicants in January 2022, with those agreements then finalised following that. (2)

- A new independent report has set out a series of five recommendations to transform how Scottish companies secure work in offshore wind. The Strategic Investment Assessment (SIA) report was commissioned by the Scottish Government and offshore wind industry and led by Professor Sir Jim McDonald of the University of Strathclyde. It recommends a focus on bringing the manufacturing of floating offshore wind platforms to Scotland, through the creation of a Scottish Floating Offshore Wind Port Cluster, with ports acting in partnership to provide the required infrastructure area. The report says that in order to help ports invest so they are ready to support projects coming out of the current ScotWind Leasing round, a new partnership will be needed. It also says that the industry must learn from sectors like oil and gas, and develop a collaborative framework for the future requirements of the offshore wind sector, and highlights the need for the UK and Scottish governments to help prime early investment to build world-class port facilities. (3)
- Untapped mine water underneath Dalmarnock and Rutherglen's Cuningar Loop could generate geothermal energy to help heat homes and businesses. The UK Geoenergy Observatory in Glasgow has been studying the sites for a number of years and has now completed a first survey of the water circulating up to 88m below the city. The only facility of its kind in the world, the observatory has used boreholes to yield important data on the status of the mine systems and the role they could play in decarbonising energy supplies. Mine water between 50 and 90m below Glasgow is at 11-13°C. This compares to Scottish groundwater, which has an average temperature of 10°C. (4)
- A tidal-powered turbine, which its makers say is the most powerful in the world, has started to generate electricity via the grid in Orkney. The Orbital O2 has the capacity to meet the annual electricity demand of 2,000 homes for the next 15 years. In May, it was sailed out of Dundee, where it was assembled over 18 months. (5)
- Scottish consumers back plans for net zero emissions by 2045, but are 'in the dark' over the challenges it will pose in their own lives despite high profile campaigns, new research has found. 65% had no identifiable energy efficiency measures or renewable technologies installed in their home, a Citizens Advice Scotland study has revealed. (6)

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1. Renew Economy 26th Aug 2021 <https://reneweconomy.com.au/worlds-largest-floating-wind-farm-completed-in-scotland/>
 2. Shetland News 22nd July 2021 <https://www.shetnews.co.uk/2021/07/22/interest-registered-in-offshore-wind-site-east-of-shetland/>
 3. The National 20th Aug 2021 <https://www.thenational.scot/news/19525748.report-sets-transform-scots-firms-involvement-offshore-power/>
 4. Herald 28th July 2021 <https://www.heraldscotland.com/news/19472620.scientists-bid-transform-disused-mines-renewable-energy-sources/>
 5. BBC 28th July 2021 <https://www.bbc.co.uk/news/uk-scotland-north-east-orkney-shetland-57991351.amp>
 6. Herald 19th July 2021 <https://www.heraldscotland.com/news/19451415.two-three-scots-consumers-in-dark-green-measures/>

12 Climate Emergency

- More than a third of UK local authorities are supporting policies which could increase carbon emissions, such as new roads or airport expansion, despite almost 90% of local authorities having declared a 'climate emergency'. The findings have led campaign group Friends of the Earth to call on the government to do more to enable councils to play their part in the UK's net zero transition, last week setting out a "simple set of measures" to help councils drive down emissions. Specifically, the group proposes scrapping the government's £27bn roads programme and reallocating the funding for investment in public transport infrastructure, as well as measures to make active travel more reliable, safe, and affordable. Friends of the Earth also calls for a legal requirement for local authorities to take UK climate targets into account when considering planning applications and reforms to provide councils with additional powers to refuse developments which would increase carbon emissions. A clear role and long-term funding for local authorities should be set out in the government's forthcoming Net Zero Strategy. (1)
- The National Audit Office (NAO) says 91% of UK's local authorities have set at least one climate commitment, with more than one-third (38%) committing to reach net-zero for their operations or local area by 2030. But their ability to deliver against these goals could be hampered by a lack of clarity and support from Whitehall departments. On the clarity side of things, the report states that most local authorities would support the introduction of mandates for net-zero targets from councils. This should come with additional guidance on how to communicate targets and accelerate decarbonisation, the NAO's consultations with city, town and regional leaders found. The report additionally urges departments to close green policy gaps as soon as possible, giving local authorities confidence in the direction of travel in terms of timings and technologies for the UK's highest-emitting sectors. It cites a stock-take from the Ministry of Housing, Communities and Local Government (MHCLG) which found 45 policy areas that are likely to impact the local response to the climate crisis. The Ministry warned of a potential "significant risk" of inconsistent goals and messaging. (2)
- Glasgow is seeking private investors to help fund a £30 billion plan for green investment in the city. Council leaders aim to take advantage of the focus COP26 will bring, in order to seek backing for a range of projects that would transform the face of Scotland's largest city and turn Glasgow into a global green flagship city. Glasgow has created its own "Greenprint for Investment" – a series of projects that respond to the climate emergency – which will be pitched to some of the world's biggest financiers. It is estimated that delivering the "Greenprint" projects will require £30bn. With the cost of mitigating climate change too steep for any council to bear, Glasgow is seeking the involvement of the private sector. The two biggest projects will be: building a Glasgow Metro system intended to support the transition to sustainable transport; and the retrofitting of homes across the region to upgrade insulation and utilise clean energy. A district heating network is also included. (3) Around 50% of the city's heat could be sourced from the Clyde – providing heat to hundreds of thousands of homes, Retrofitting 450,000 homes for energy efficiency across Glasgow will cost around £10 billion. Glasgow's famous tenements, however, are infamously energy inefficient. The council has successfully experimented with making empty tenements

“passive houses” – so they leave the smallest carbon footprint. The plan is to make this “rolloutable so we can apply it to 70,000 tenements across the city. It can be done”. (4)

- The first session of a citizens’ assembly, set up to discuss the climate emergency, took place in Glasgow at the beginning of August. The assembly, which is being facilitated by Ipsos Mori and Glasgow City Council, will involve a group of 50 residents from across the city who have been selected at random. (5)

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1. Business Green 16th Aug 2021 <https://www.businessgreen.com/news/4035831/government-fresh-calls-help-local-authorities-drive-net-zero-transition>
 2. Edie 16th July 2021 <https://www.edie.net/news/11/-Serious-weaknesses--in-UK-Government-s-plans-for-engaging-local-councils-on-net-zero--report-warns/>
 3. Herald 8th Aug 2021 <https://www.heraldscotland.com/politics/19499104.council-will-look-for-investors-cop26-reinvest-glasgow/>
 4. Herald 8th Aug 2021 <https://www.heraldscotland.com/politics/19498971.neil-mackays-big-read-brave-new-glasgow-council-leader-outlines-30bn-vision-transform-city/>
 5. The National 3rd Aug 2021 <https://www.thenational.scot/news/19486422.first-session-citizens-assembly-held-glasgow-week/>

13 COP26

Glasgow City Council has passed a motion to prevent companies that “contribute towards catastrophic climate change” from its venues during COP26. The motion, passed unanimously. The motion requires the Council to “take steps to ensure that venues and community spaces [it either owns or operates] are not used for the benefit of those who deny, ignore or wilfully contribute to catastrophic climate change for the duration of COP26”. (1)

Meanwhile, organisers of the Climate Fringe are calling for people and businesses in Glasgow to help showcase artworks created by communities in some of the world’s poorest countries that are being hit hardest by the environmental crisis. The works will be part of a citywide exhibition taking place in the run-up and throughout COP26. (2)

The international nuclear energy industry has complained about being excluded from the COP26 climate summit in Glasgow — prompting FoE Scotland to say it should have “no place” there. In a letter to COP26 UK president, Alok Sharma, global trade body, the World Nuclear Association, said that every application made by nuclear groups for exhibits at the conference had been rejected. This was “very disappointing”. The World Nuclear Association, which lists 183 nuclear companies as members, said it was “deeply concerned” that plans for nuclear exhibits in civil society’s Green Zone at COP26 had been turned down. (3)

1. Edie 20th Aug 2021 <https://www.edie.net/news/9/Climate-laggards-to-be-banned-from-booking-Glasgow-s-public-venues-for-COP26/>
2. Scotsman 16th Aug 2021 <https://www.scotsman.com/news/environment/cop26-call-for-glasgow-exhibition-spaces-to-showcase-worlds-climate-hit-communities-3347164>
3. Ferret 19th Aug 2021 <https://theferret.scot/were-barred-from-cop26-nuclear-industry-complains/> World Nuclear News 17th Aug 2021 <https://www.world-nuclear-news.org/Articles/Message-Nuclear-must-be-represented-at-COP26,-says>

14 Just Transition

The NFLA has published a report on the need for a ‘Just Transition’ to help communities and protect jobs in mitigating and adapting to climate change. The report includes a detailed analysis on the work of the Just Transition Commission in Scotland and the importance of such policies being delivered across the UK and Ireland. There are lots of jobs in the fossil fuel and related sectors, and it is important, given the lessons that took place from the end of the mining industry, to transfer these jobs and skills to other sectors as carefully and as fairly as possible. (1)

The Scottish Government has established a £28m Energy Transition Fund to help the energy sector grow and diversify and accelerate the journey to net zero. and underpins the north-east’s ambitions to become a world leader in this transition. The projects involved include “energy hubs” producing low carbon hydrogen which can be integrated with Scotland’s offshore wind resources, a plan to export hydrogen by repurposing existing pipelines, developing gas turbines to provide a low carbon alternative to natural gas and the building of an offshore industrial Robots and Autonomous System centre focused on supporting the energy transition. (2)

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1. NFLA 3rd Aug 2021 <https://www.nuclearpolicy.info/news/nfla-report-need-for-just-transition-help-communities-protects-jobs-mitigating-adapting-climate-change/>
 2. Scotsman 7th Aug 2021 <https://www.scotsman.com/news/politics/cop26-millions-announced-for-projects-to-accelerate-energy-transition-3337531>

15 Submarines

The Royal Navy has refused to say whether anyone was disciplined following an incident in which a nuclear submarine nearly crashed into a ferry carrying 282 people off the Scottish coast. The navy also won’t say whether it carried out an independent review to reduce the risks of future collisions. This was recommended by government investigators concerned about the near-miss and two other nuclear submarine crashes. Campaigners accuse the navy of using the excuse of national security “*to cover up dangerous incompetence*”. The Scottish National Party (SNP) condemns the secrecy as “*absolutely untenable*”.

The Ferret 5th Aug 2021 <https://theferret.scot/royal-navy-secrecy-nuclear-submarine-crashes/>