

# SAFE ENERGY E-JOURNAL No.77

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The March meeting of the NFLA had to be postponed because of adverse weather conditions, so this report is in two sections with an April update produced for the re-scheduled meeting/

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

<http://www.no2nuclearpower.org.uk/wp/wp-content/uploads/2018/05/NuClearNewsNo107.pdf>

## 1 Scotland's First Energy Strategy

Scotland's first Energy Strategy was finally published on 20<sup>th</sup> December 2017. The strategy has six strategic priorities:

- Promote consumer engagement and protect consumers from excessive costs;
- Champion Scotland's renewable energy potential, creating new jobs and supply chain opportunities;
- Improve the energy efficiency of Scotland's homes, buildings, industrial processes and manufacturing;
- Continue to support investment and innovation across our oil and gas sector, including exploration, innovation, subsea engineering, decommissioning and carbon capture and storage;
- Ensure homes and businesses can continue to depend on secure, resilient and flexible energy supplies;
- Empower communities by supporting innovative local energy systems and networks;

During a statement to the Scottish Parliament, Business, Energy and Innovation Minister Paul Wheelhouse also announced that the latest figures from the Energy Saving Trust show a 12% increase in the level of community and locally owned renewable capacity operating in Scotland, which now sits at more than 660MW.

The Strategy can be found here: [www.gov.scot/energystategy](http://www.gov.scot/energystategy)

The Scottish Government conducted a consultation on the Strategy at the beginning of 2017. The NFLA Scottish Forum response is available here: [http://www.nuclearpolicy.info/wp/wp-content/uploads/2017/03/A268\\_NB155\\_Scottish\\_energy\\_strategy.pdf](http://www.nuclearpolicy.info/wp/wp-content/uploads/2017/03/A268_NB155_Scottish_energy_strategy.pdf)

The Strategy includes a range of actions to deliver goals, including a £20 million Energy Investment Fund, which will build on the success of the Renewable Energy Investment Fund, and a £60 million Low Carbon Innovation Fund, to provide dedicated support for renewable and low carbon infrastructure over and above wider interventions to support innovation across the economy. (1)

The Strategy says the majority of consultation responses identified the targets as a key element of the Strategy –and central to the ‘whole-system’ approach. The Strategy sets two new targets for the Scottish energy system by 2030:

The equivalent of 50% of the energy for Scotland’s heat, transport and electricity consumption to be supplied from renewable sources. (17.8% of all energy came from renewable sources in 2015.)

An increase by 30% in the productivity of energy use across the Scottish economy

The vision for 2050 is based on three core principles:

A whole system view - the focus includes heat and transport, alongside electricity and energy efficiency;

An inclusive energy transition - the transition to a low carbon economy over the coming decades needs to happen in a way that tackles inequality and poverty, and promotes a fair and inclusive jobs market;

A smarter local energy model - supporting and delivering local solutions to meet local needs, linking local generation and use, can help create vibrant local energy economies.

*The Times* asked why the government released such an important strategy when festive shopping was on most people's mind? It claimed Scotland barely noticed the minister's plans. The confusion doesn't end there. At its core, this 90-page vision of how we will power, light and heat our lives by the middle of this century opts for ambivalence. It advances two starkly contrasting scenarios for 2050: an electric future and a hydrogen future. In the first, 80% of residential energy demand across Scotland is met from electricity and 100% of the cars and light vans on Scotland's roads are also electric-powered. In the second, 60% of home energy demand has seen natural gas replaced by hydrogen, while hydrogen also drives all cars and light vans and most buses, too.

The newspaper continues by saying the Government is much clearer about what it doesn't want - new nuclear capacity and fracking. (2)

A public consultation on the establishment of a state-owned, not-for-profit energy company will get under way later this year. The aim is that this company will support economic development and contribute to tackling fuel poverty, as well as being run on a not-for-profit basis. Mr Wheelhouse told the Holyrood chamber it was “*important to seek views and expertise as we further develop this proposal*”. He added: “*Early feedback on the strategy consultation has been constructive and we’re grateful for this input. We today commit to a formal process of public consultation in the later part of 2018.*” (3)

The Government also promised to publish an Annual Energy Statement, setting out the country's latest energy statistics, its progress against targets and key priorities, and an up-to-date assessment of how technological advances will impact the planned changes to the energy system. (4)

Scotland's electricity supply is already largely decarbonised, with renewables meeting 54% of its electricity needs in 2016. But the majority of the country's energy demand for heating and transport is still met with fossil fuels, meaning only about 18% of Scotland's final energy consumption comes from renewable energy sources. Achieving the 50% target will require the share of renewable electricity to rise from 54% to more than 140%, the Strategy notes, to help offset slower gains elsewhere. Of particular focus will be driving development of deep water offshore wind and lobbying the UK government to allow new onshore wind projects. Hitting the target also depends on the rapid rollout of electric vehicles running on clean power, and renewable heating technology accounting for 20% of non-electrical heating demand, the Strategy adds.

Gina Hanrahan at WWF Scotland said: *“To ensure a truly effective, joined-up strategy, more effort needs to be put into developing policy to reduce our demand for energy in the first place. The Scottish Government needs to enable people to get out of their cars, insulate their homes and improve the energy efficiency of their businesses. With growing demand for the Climate Change Bill to increase our ambition in line with the Paris Agreement, a clearer vision and bold, substantive policies will be needed more than ever. The final Climate Change Plan, due in February, should be the real test of whether this strategy is given teeth.”* (5)

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1. Scottish Government Press Release 20<sup>th</sup> Dec 2017 <https://news.gov.scot/news/gbp-80m-for-low-carbon-growth>
  2. Times 3rd Jan 2017 <https://www.thetimes.co.uk/edition/scotland/pointing-the-way-ahead-to-a-cleaner-energy-future-but-which-way-qfhqw5fg6>
  3. Energy Voice 21st Dec 2017 <https://www.energyvoice.com/other-news/159521/consultation-state-owned-energy-company-scotland-due-next-year/>
  4. Business Green 21st Dec 2017. <https://www.businessgreen.com/bg/news-analysis/3023476/scotland-promises-50-per-cent-clean-energy-by-2030-under-first-ever-energy-strategy>
  5. Holyrood 20th Dec 2017 <https://www.holyrood.com/articles/news/energy-strategy-targets-half-scotlands-energy-come-renewables-2030>

## 2 A Scottish Energy Company

Scotland could become a 'European giant' in renewables by 2030, driven by a new national energy company controlled at municipal level, according to a new discussion paper by think tank Common Weal, written by electrical design engineer Craig Berry. (1)

The Scottish Energy Company – the details of which are still being developed - should have five key objectives, Berry says. These are: reducing fuel poverty and eventually eliminating it; meeting 75% of energy demand through renewables; decentralising the energy supply; expanding research and development in green and smart technologies; and maximising social value through a not-for-profit approach.

Berry said: ***“Municipalisation is critical in creating a transformation to a sustainable energy system based on energy efficiency and renewable energies. Creating a municipal energy company allows strong governance in the local energy market. The return for each municipality running its own local utility is significant when the focus is on affordable energy as opposed to increasing returns.”*** (My emphasis) The discussion paper says that the private monopolies of the UK energy regime hold back development of Scotland’s renewable potential, with Scotland currently utilising less than one-sixth of its total green energy power capacity.

The paper looks at options available for Scotland to become an international leader in the fight to tackle climate change and assisting Europe with its energy demand, when the Scottish national energy company, promised by Nicola Sturgeon is established. It sets a 2030 timeline for achieving a transformation, focusing on the changes needed in energy infrastructure, electric vehicles, autonomous distribution and renewable shipping. (2)

UK energy policy over the past three decades has been based on the privatisation and marketisation of the energy sector, using private companies to drive down costs through increased competition. However, with absence of capacity constraints, reports have indicated that the effect of privatisation has allowed the energy market to form an oligopoly, affecting the price structures. This paper looks at how to further enhance the energy sector in Scotland by looking at the infrastructure in place now, and how best to develop the energy sector so that it is better suited for renewable technology, electric vehicles (EV), autonomous vehicles, the shipping industry and the adaptability of new energy storage systems.

Scotland’s current renewable capacity is 9.3GW, but the potential is over 60GW. Scotland needs an energy strategy that is capable of building this infrastructure. The paper looks at two models; the Nordic development model and the German municipal model, and discusses how to influence a Scottish model for 2030.

Norway and Denmark have more decentred economic decision-making in the energy industry, with public, private and civic associations being involved in the formulation of policy. All organisations are subject to democratic processes, including election of board members. There have been five key principles to the Nordic approach:

1. Resources should be commonly owned to benefit the community as a whole rather than vested interests.
2. Resources should be geared to social need rather than private economic returns.
3. Support for principles of collective learning and knowledge formation.
4. Development of decentred institutional structures that spread economic decision making power.
5. A mix of forms of collective and public ownership that allow strategic planning at higher levels to fuse with local democracy and community participation.

Germany’s energy sector has been going through a municipalisation period, with 72 new municipal power utilities being established. Having also gone through a period of privatisation in the 1990s, the electrical power supply of municipalities in Germany has seen an increase in public ownership. The local authority has identified that municipalisation offers the opportunity to implement an

independent energy policy at local level. This is critical in creating a transformation to a sustainable energy system based on energy efficiency and renewable energies. Creating a municipal energy company allows strong governance in the local energy market. The return for each municipality running its own local utility is significant when the focus is on affordable energy as opposed to increasing returns.

German studies have shown that the trend towards the municipal ownership of local utilities has been good for meeting environmental objectives; good for improving the income of the municipal area; good for democratic accountability; and good for jobs.

The report recommends the establishment of a Scottish Energy Agency (SEA) to oversee the sector and set key targets and objectives, similar to those described by the German and Nordic models. The SEA will be required to prioritise renewable energy whilst keeping costs to the consumers as low as possible. The SEA and its subsidiaries should be run as a not-for-profit national energy company, with local authorities in control of supply, and generation controlled nationally. Scottish local authorities will run Local Energy Companies (LEC) in similar fashion to the German municipal method, increasing democracy of supply and decreasing energy costs. However, in some areas local authorities could look to combine electricity generation and supply companies to provide better service to its constituents. For rural areas, more community-based schemes might be developed that would be in the position to generate surplus electricity to the national grid.

On energy storage the report recommends establishing a National Battery Technology Innovation Centre (NBTIC) to drive the investment in battery technology so that Scotland can develop both grid-scale and domestic scale batteries to boost the efficiencies in Scotland's renewable energy market to bring down costs and increase over-supply for exportation.

On heat networks the report says the Scottish Government should identify opportunities for district heating to encourage more investment in renewable heat. With Scotland currently meeting 5% of renewable heat, with a government aim to meet 11% by 2020, more should be done to bring this closer to 100% by 2030. Policies need to be implemented which allow Local Authorities to overcome financial barriers to district heating schemes.

Scotland needs to develop a strategy to increase the number of Electric Vehicles (EVs) on the roads. There are currently around 2.86 million cars registered in Scotland with 44% of greenhouse gas emissions coming from cars. Scotland should aim for a target for EVs of 50% of vehicle share by 2030.

By adopting a more collectivist attitude toward energy where necessary and breaking away from the policy regime of the UK Government, Scotland can then invest in the strategic planning and public ownership which has seen success in neighbouring countries.

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1. The National 16th Feb 2018  
[http://www.thenational.scot/news/15998044.Scotland\\_could\\_become\\_European\\_giant\\_in\\_renewables\\_by\\_2030/](http://www.thenational.scot/news/15998044.Scotland_could_become_European_giant_in_renewables_by_2030/) and The National 16th Feb 2018

[http://thenational.scot/news/15998051.Independent\\_energy\\_for\\_an\\_independent\\_Scotland\\_let\\_s\\_make\\_it\\_happen/](http://thenational.scot/news/15998051.Independent_energy_for_an_independent_Scotland_let_s_make_it_happen/)

2. To read the paper in full see <http://www.thenational.scot/resources/files/72737>

### 3 Dounreay

In August 2017, serious concerns about the environmental and safety record of the Dounreay nuclear plant were raised by Scottish environment secretary Roseanna Cunningham. In a letter to UK energy minister Richard Harrington, she complained of a disappointing lack of progress across a range of projects that sat oddly with the planned reduction in workforce at the site. (1) Her concerns came after shortcomings in safety performance at Dounreay were identified in the NDA's annual report (2) and criticism of the environmental management at the plant by the Scottish Environment Protection Agency. Local SNP MSP Gail Ross has echoed the minister's concerns. (3)

There have been claims that the Cavendish Partnership is slowing the work down – putting things into care and maintenance and backing away from the difficult and expensive work. SEPA wants them to get on with certain things such as the shafts and silo but they have put work into care and maintenance. It's too difficult to do and there is no profit in it. They have gone for easy and quick hits – demolishing labs. The schedule is slipping because it was not right in first place. What Cavendish said they could do in 11 years was always going to be impossible. (4)

Of 10 Business Plan activities expected in 2016/17 as part of the Dounreay Decommissioning Programme seven were deferred including: beginning operations at the silo headworks to remove waste from the waste silo; beginning operations at the solid waste treatment and packaging plant; beginning operations at the shaft headworks for waste removal from the waste shaft; transferring Prototype Fast Reactor (PFR) irradiated fuel material to the spent fuel store; and reaching an agreed end-point with particles remediation. (5)

The NDA Business Plan 2017-2020 gives 2030-33 as the date for reaching an interim site end state, with encapsulation of the waste from the Dounreay Shaft and Silo is now expected to be completed by 2028. (6)

In December companies were invited to note interest in a number of construction and demolition projects, including the retrieval and packaging radioactive waste from the Shaft and Silo. The new framework agreement, potentially worth up to £400 million, was published in the Official Journal of the European Union (OJEU). (7) The decommissioning services framework agreement will initially be for a period of up to 4 years with the possibility of extensions of up to 3 years. Waste from the old low level waste pits will also be retrieved, repackaged and consigned to modern waste facilities. Contracts are expected to be awarded during the second half of 2018. (8)

Meanwhile two sites at Dounreay were rated as at risk or poor by SEPA, in terms of environmental compliance in 2016. The figures are a measure of how much sites are sticking to the terms of their operating licence. Dounreay Site Restoration Limited said it has spent more than £1m in the last year upgrading facilities at the former nuclear power project, to ensure continued compliance with environmental regulations. (9)

One of the sites was the new Low Level Waste Pits which had two issues of significance in 2016. Early in the year a failure to adequately control the Eu-152 being disposed of via the demolition waste route resulted in a breach of the authorised disposal inventory for that vault. When identified during the end of month checks the waste was removed, bringing the disposed of inventory back within the limits set out in the authorisation. In July a failure to appropriately grout a waste package was identified. (10)

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1. Scottish Government Press Release 6th August 2017 <https://news.gov.scot/news/environmental-andworkforce-concerns-at-dounreay>
  2. NDA Annual Report and Accounts 2016/7 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/630177/NDA\\_Annual\\_Report\\_and\\_Accounts\\_2016\\_to\\_2017.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/630177/NDA_Annual_Report_and_Accounts_2016_to_2017.pdf)
  3. Sunday Times 6th Aug 2017 <https://www.thetimes.co.uk/edition/scotland/dounreay-safety-concernsraised-by-cunningham-sf7nd5d9b>
  4. BBC File on 4, The Nuclear Option - Powering the Future and Cleaning Up the Past, 31st October 2017 <http://www.bbc.co.uk/programmes/b09byv6k>
  5. NDA Annual Report and Accounts 2016/7 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/630177/NDA\\_Annual\\_Report\\_and\\_Accounts\\_2016\\_to\\_2017.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/630177/NDA_Annual_Report_and_Accounts_2016_to_2017.pdf)
  6. NDA Business Plan 2017-2020 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/604324/NDA\\_Business\\_Plan\\_2017\\_to\\_2020.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/604324/NDA_Business_Plan_2017_to_2020.pdf)
  7. BBC 22nd Dec 2017 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-42445819>
  8. DSRL 21<sup>st</sup> Dec 2017 <https://dounreay.com/2017/12/major-contract-support-next-stage-dounreay-clean/>
  9. BBC 15th Feb 2018 <http://www.bbc.co.uk/news/uk-scotland-43060496>
  10. See <http://apps.sepa.org.uk/compliance/>

## 4 Hunterston A

The decommissioning of the Hunterston A nuclear station is “set to end” in 2024, according to the Largs and Millport Weekly News. Of course what they mean is the old Magnox station will enter its care and maintenance stage in 2024. (This looks to be about two years later than expected in the Scottish Government’s Higher Active Waste Policy.) It won’t be until after 2070 that reactor dismantling will begin. Largs Community councillor Drew Cochrane, who sits on the Hunterston site stakeholders group (SSG), said: “*The A Station will close in 2024. There will no staff on site. At the moment 125 employees, 90 contractors, and it has cost £41m in the past year to decommission.*” A spokesman for Magnox, operators of Hunterston ‘A’ said: “*Under the current Magnox lifetime plan Hunterston ‘A’ is scheduled to go into care and maintenance by 2024 when the only buildings that will be left will be the two reactors, the Intermediate Level Waste Store and potentially one or two other buildings.*”

Hunterston A is likely to be the first reactor to be dismantled sometime after 2070 when the Scottish radioactive waste inventory will leap from just less than 20,000m<sup>3</sup> packaged waste to 25,000m<sup>3</sup>. Chapelcross will then add another 5,000m<sup>3</sup>. Final dismantling of Torness and Hunterston B is not expected to take place until after 2115.

Largs & Millport Weekly News 10th Feb 2018

[http://www.largsandmillportnews.com/news/15985216.Hunterston\\_A\\_to\\_close\\_in\\_2024/](http://www.largsandmillportnews.com/news/15985216.Hunterston_A_to_close_in_2024/)

## 5 Island Energy

The UK Government has finally unveiled plans to give subsidy support to 'remote islands' wind through the Contract for Difference (CfD) auction system. While having enormous potential for electricity generation, thanks to strong winds, as well as new jobs and work for local suppliers, island windfarms face higher costs due to their location and transmission requirements. The Department for Business, Energy and Industrial Strategy (BEIS) proposes to classify 'remote islands' onshore wind as a new technology that can compete in future subsidy auctions for "less established" technologies - a category that also includes wave, tidal and offshore wind power. According to government research wind projects on Western Isles, Orkney and Shetland could supply around three per cent of the UK's total electricity demand. The news follows comments from Climate Change Minister Claire Perry, who has repeatedly suggested onshore wind is "*absolutely a part of the future*" energy mix, despite her party's previous manifesto commitments to block the development of large farms across much of the UK. (1)

The Business, Energy and Industry Department consultation on the subject continues until 9<sup>th</sup> March 2018. (2)

The UK government announced that £557 million would be available for the next CfD auction to be held in 2019. But there will be no more money available after that until at least 2025. (3)

Island communities welcomed news the European Commission will not stand in their way when submitting windfarm plans in the next Contract for Difference (CfD) auction round. A number of planned wind projects on Orkney, Shetland and the Western Isles totalling 750MW are now a step closer to being eligible to compete in the third CfD auction round. (4)

### Shetland

The Shetland Islands could be set for a second major energy boom after regulators rejected plans for a 60MW subsea cable which would have brought power from the Scottish mainland.

In July, the EU postponed by a decade the introduction of stricter emissions targets that were due to affect the Lerwick Power Station from 2020. It meant decommissioning of the plant could be delayed by four years. With wind farms on remote islands now allowed to compete in an auction to sell electricity to the National Grid from 2019, this is being seen as a catalyst for a new giant 600MW interconnector cable which can carry surplus power from wind turbines sites to the mainland – a potentially lucrative development for Viking Energy's proposed windfarm.

The Shetland Island's vast oil fund which was set up in the late 1970's has a half stake in a planned 103 turbine wind farm on the islands which would raise around £10 million a year for the local community. The Viking windfarm would generate 450MW of power is capable of supplying power to nearly 300 homes.

Shetland Isles Council development committee chairman Alastair Cooper added: *"Whatever size of cable we get for Shetland, I want it to be a cable that can transmit both ways. The problem we had with the National Grid solution was that it was a one-way cable; it could only import, it couldn't export."* (5)

Local developer group Energy Isles has kicked off the early stages of planning for another 200MW onshore wind farm on Shetland. The company has initiated scoping for a project featuring 63 turbines on the island of Yell. (6)

## Western Isles

Lewis Wind Power, which is a joint venture between EDF Energy Renewables and Wood from Aberdeen is also preparing to take part in the CfD auction in spring 2019. It is developing the Uisenis and Stornoway wind projects which are the two largest developments in the Western Isles. EDF Energy says the size of the proposed projects is critical in making the financial case for a much needed interconnector cable from the Western Isles to the Scottish mainland. Substantial development of wind farms on the island can only happen if the electricity can be easily exported to the National Grid. The development will unlock significant community benefits in payments, ownership and jobs. (7)

However, hundreds of crofters on Lewis are fighting the EDF and Wood Group's windfarm proposal. They have objected to proposals to build on communal land close to Stornoway because they want to build their own development, with the profits going to the local community. The row started because under Scottish law crofters have rights over the land even though the multinationals have bought a lease. EDF and Wood have now applied to the Scottish land court to force through the development of 36 turbines on the "common grazings", triggering the objections to the plans. Wind is increasingly seen as a key natural resource in the Western Isles, with the potential to boost the economic future of the islands. The contested area is moorland called the Stornoway General, a few miles from the main town. Stornoway General is divided into areas for different villages and owned by the Stornoway Trust. One township, Point and Sandwick, has built three turbines on its section, borrowing £14m from Santander bank to finance the development, and the turbines now support a drug and alcohol programme, a hospice and a local arts centre.

Calum MacDonald, a former Labour MP for the area who was involved in developing the first three turbines, said the earlier development proved that the crofters' plans were viable. Angus McCormack, a local councillor and chair of the Point and Sandwick Trust, said a larger community-owned project could finance more local causes, as well as create jobs on an island with a high poverty rate. *"We have to do it for the young people. There is nothing else to stay for,"* said McCormack. *"Building our own windfarms would be transformational to the islands. One of the key things is trying to keep hold of the young people. They go away for their education, and they never come back."* (8)

Meanwhile another company behind plans to develop a 14-turbine windfarm on Lewis have revealed plans to increase the size of the development in order to improve their chances of securing CfD finance. Forsa Energy, which hopes to establish the Druim Leathann project near the village of North Tolsta, is currently preparing its bid for the auction in 2019. Following a recent public consultation meeting in the village of North Tolsta, Forsa Energy submitted a new planning application for their project, as the size of the proposed turbines is to be increased from 126 metres to the blade height to 140 metres. Forsa Energy director of renewable generation Alasdair MacLeod said: *“we need to ensure we get as much power out of the individual turbines as possible. We can achieve that by increasing the tip height of the turbines, though there is a balance to be struck between increasing the output and ensuring environmental impacts are acceptable.”*

A smaller, single wind turbine already exists near North Tolsta, which is entirely owned by a community group. However, Mr MacLeod, who said his project has the support of nearby residents and crofters, doubted whether a local group would be able to invest in a project of comparable size or larger to the one proposed by his company — as some on the island have suggested. (9)

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1. Business Green 15th Dec 2017 <https://www.businessgreen.com/bg/news/3023197/wind-lifeline-government-unveils-plan-to-include-remote-islands-wind-in-cfd-auctions>
  2. BEIS 15<sup>th</sup> Dec 2017 <https://www.gov.uk/government/consultations/contracts-for-difference-cfd-proposed-amendments-to-the-scheme>
  3. Business Green 23<sup>rd</sup> Nov 2017 <https://www.businessgreen.com/bg/analysis/3021848/has-the-renewables-sector-been-dealt-a-blow-by-the-budget>
  4. Press & Journal 13th Feb 2018 <https://www.pressandjournal.co.uk/fp/business/north-of-scotland/1413491/boost-for-islands-energy/>
  5. Herald 24th Nov 2017 [http://www.heraldscotland.com/news/15680780.Shetland\\_aiming\\_to\\_turn\\_North\\_Sea\\_oil\\_into\\_green\\_energy/](http://www.heraldscotland.com/news/15680780.Shetland_aiming_to_turn_North_Sea_oil_into_green_energy/)
  6. RENews 30<sup>th</sup> Nov 2017 <http://renews.biz/109344/locals-unwrap-200mw-shetland-plan/>
  7. EDF Energy 31st Jan 2018 [http://media.edfenergy.com/r/1348/lewis\\_wind\\_power\\_opens\\_new\\_office\\_in\\_stornoway](http://media.edfenergy.com/r/1348/lewis_wind_power_opens_new_office_in_stornoway)
  8. Guardian 4th Feb 2018 <https://www.theguardian.com/uk-news/2018/feb/04/windfarm-crofters-lewis-fight-edf-wood-group-scottish>
  9. Press and Journal 17th Feb 2018 <https://www.pressandjournal.co.uk/fp/news/islands/western-isles/1416405/forsa-energy-reveal-intentions-increase-proposed-windfarm-development-lewis/>

## 6 Fuel Poverty

The Scottish Government’s consultation on Fuel Poverty closed on 1st February 2018. See

<https://consult.gov.scot/better-homes-division/fuel-poverty/>

Fuel poverty has fallen by nearly 100,000 households in a year, according to the latest home conditions survey. The Scottish government figures show that in 2016, 649,000 households had to spend more than 10% of income on fuel to warm the home. According to statisticians, two thirds of the change was explained by falling energy prices, and one third by improved energy efficiency. Very little of the change was explained by rising income. The improvement was clearest in the private sector, compared with social housing. Fuel poverty is clearly more widespread in rural homes.

Lori McElroy, of the Existing Homes Alliance - a group of organisations campaigning on housing - said the fall in fuel poverty is welcome, but for a quarter of households to remain in that position "is unacceptable, particularly in rural areas where fuel poverty levels remain high at 37%." She added: "We call on the Scottish government to do more to help people who are living in hard-to-heat housing, especially those who live off the gas grid or use electric heating". (1)

Sarah Boyack, head of public affairs at the Scottish Federation of Housing Associations, said: "It is particularly concerning that the percentage of housing association households in fuel poverty is higher than the overall national average, despite their housing being the most energy efficient. The figures demonstrate that social landlords need more support to further improve the energy efficiency of their stock in order to help their tenants who are on lower incomes and therefore more vulnerable to fuel poverty". (2)

Around a million people find themselves in fuel poverty as a result of high energy costs, low income, poor energy efficiency and the way energy is used in the home. Although 99,000 households have been lifted out of fuel poverty in the last year, we are only back where we started in 2007. The drop in fuel poverty is largely down to falling energy prices, with only a third of the reduction coming from improvements to the energy efficiency of our homes. And therein lies the challenge for the Scottish Government. Energy efficiency is the one driver of fuel poverty where the Scottish Government has all the devolved levers of power that they need to make a difference. Yet spending on energy efficiency has actually decreased since the Government designated it a National Infrastructure Priority two years ago. (3)

According to WWF Scotland: "the new Fuel Poverty Strategy which will emerge following the consultation needs to set much more ambitious targets for eradicating fuel poverty and set strong minimum standards for the energy performance of our homes. Secondly, the upcoming Climate Change Bill is a chance to set strong targets for Scotland's energy efficiency programmes over the next 20-30 years. Finally, the Warm Homes Bill, due in Parliament in June, must drive forward action and investment that genuinely creates warm homes, rather than more warm words. We owe it to those people living in cold homes and to the planet to get this right." (4)

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1. BBC 5th Dec 2017 <http://www.bbc.co.uk/news/uk-scotland-42242999>
  2. The National 6th Dec 2017 [http://www.thenational.scot/news/15703628.100\\_000\\_fewer\\_Scottish\\_households\\_in\\_fuel\\_poverty/](http://www.thenational.scot/news/15703628.100_000_fewer_Scottish_households_in_fuel_poverty/)
  3. Scotsman 12th Dec 2017 <https://www.scotsman.com/news/opinion/sarah-beattie-smith-how-high-energy-bills-are-making-us-ill-1-4636691>

4. Herald 1st Feb 2018

[http://www.heraldscotland.com/opinion/15911354.Agenda\\_The\\_fight\\_against\\_climate\\_change\\_begins\\_at\\_home/](http://www.heraldscotland.com/opinion/15911354.Agenda_The_fight_against_climate_change_begins_at_home/)

## 7 Low Carbon Infrastructure Transition Programme

A £60m fund to keep Scotland at the forefront of low-carbon innovation has been launched. The Low Carbon Infrastructure Transition Programme (LCITP), co-funded by the European Regional Development Fund (ERDF), will fund large-scale projects which support the ambitions of Scotland's Energy Strategy. Projects which deliver low-carbon heating solutions, integrated energy systems, and ultra-low emission vehicle charging infrastructure will be able to apply for up to £100,000 to develop investment-ready business cases, or financial support of up to 50 per cent of the total capital value of a project up to a maximum of £10 million per project for capital-ready projects. (1)

Twelve projects have already been awarded a share of £2.6 million. Projects in Glencoe, Callander, Aviemore, Stromness and St Andrews were amongst them. The schemes include low carbon heat provision at the University of the West of Scotland's Ayr campus, energy efficient homes for older people in North Lanarkshire and an energy project in Glencoe Village. (2)

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1. The National 22nd Jan 2018

[http://www.thenational.scot/news/15887006\\_60m\\_fund\\_launched\\_to\\_support\\_low\\_carbon\\_innovation/](http://www.thenational.scot/news/15887006_60m_fund_launched_to_support_low_carbon_innovation/) and Scottish Government 22nd Jan 2018 <https://news.gov.scot/news/low-carbon-infrastructure-support>

2. The National 3rd Dec 2017

[http://www.thenational.scot/news/15698582.Scottish\\_Government\\_award\\_2\\_6m\\_funding\\_to\\_local\\_green\\_energy\\_projects/](http://www.thenational.scot/news/15698582.Scottish_Government_award_2_6m_funding_to_local_green_energy_projects/) and Scottish Government 3rd Dec 2017 <https://news.gov.scot/news/supporting-low-carbon-energy>

## 8 Green Heat & Transport

Dave Elliott, emeritus professor of technology policy at the Open University, says the UK Government expects renewables to supply around 50% of UK electricity by 2035, about 45GW mostly wind and solar PV. Near 100% by 2050 certainly now seems possible given the political will. Scotland is already at over 60%. But what about heat and transport? The current plan is to decarbonise them with green electricity - and nuclear, if it expands. This electricity would be used to run heat pumps and for Electric Vehicle (EV) charging. But that is not the only option. Indeed, it may not be the best one. Although sufficient generation capacity could be available, it would be hard for

the existing electricity grid to deliver the power needed for all UK heating (around 40% of UK energy demand) as well as for EV charging (which some say might require 20%).

The UK gas grid carries around 4 times more energy than the electricity grid. An alternative approach is to carry on using the gas grid for heating, and existing central heating boilers, but to decarbonise the gas. One way to do that is to convert fossil gas into hydrogen (by steam reformation) and capture the CO<sub>2</sub> produced in this conversion process. An arguably better 100% green option, avoiding the need to store CO<sub>2</sub>, would be to produce hydrogen gas by electrolysis, using electricity from wind and solar, for direct injection into the gas mains or for conversion, using captured CO<sub>2</sub>, into methane, for use in the gas main. This 'power to gas' (P2G) approach has some interesting implications. If there was a large amount of renewable capacity in place, sized to be enough, when able to run at full power, to meet peak power demand, then, although there might occasionally be shortfalls, there would also, at times, be a large surplus of electricity produced, which could feed into P2G conversion process. Some of the hydrogen or methane produced could be stored ready to make electricity again, in a gas turbine or fuel cell, when there was a lull in renewable availability and/or large peaks in power demand. The rest could go for heating via the gas main and /or for use as vehicle fuel. (1)

The UK's Clean Growth Strategy says by 2050 home heating will need to be fully decarbonised. Natural gas supplies around 70% of UK heat demand. The Scottish Energy Strategy sketches out two starkly contrasting scenarios for 2050 for heat and transport: an electric future and a hydrogen future. In the first, 80% of residential energy demand across Scotland is met from electricity and 100% of the cars and light vans on Scotland's roads are also electric-powered. In the second, 60% of home energy demand has seen natural gas replaced by hydrogen, while hydrogen also drives all cars and light vans and most buses, too.

The Scottish Finance Secretary has pledged investment of £137 million for energy-efficiency measures and decarbonisation of heat in 2018-19. To hit green goals will require our buildings and industries to be more heat-efficient. We will have to recover waste heat from industry and deliver it to homes using district heating networks. We must also find ways to harness new sources of heat, such as deep geothermal and recovered heat from abandoned mine workings. To do all this we first need to further develop knowledge and understanding among those responsible for our built environment. We then need to invest in pilot projects to demonstrate what is possible, to learn how best to apply existing technology in the Scottish context and to allow people to come and see what can be achieved in the delivery of low-carbon heat. Our Scandinavian neighbours are already making big headway, with 70% of heat in Sweden coming from renewable sources. This funding is well placed to help Scotland achieve the same result. (2)

## Heat Networks

Scotland is seeking to connect 40,000 homes to heat networks by 2020, representing 1.5TWh of Scotland's heat demand. The Scottish government's District Heating Loan Fund, established in 2011, and Low Carbon Infrastructure Transition Programme have supported significant heat network investment in Scotland. (3)

Many cities in Europe which already have district heating schemes are adapting them to keep people warm without the use of fossil fuels. Originally the hot water would have come from power stations burning coal or gas, which means more greenhouse gas emissions. More recently, renewable energy, bio-gas or capturing waste heat from industrial production, supermarkets or IT systems, is providing alternative sources of large scale heating without adding to the carbon dioxide in the atmosphere.

Sweden has pioneered the switch from fossil fuels to other ways of heating water. The Swedish Environmental Protection Agency says the country has gone from almost exclusively relying on fossil fuels to being 90% powered by renewable and recycled heat in 2017. Today Stockholm, the capital, which needs heating for nine months of the year, contains 2,800 km of underground pipes connecting to more than 10,000 buildings, says Erik Rylander from Fortum, an energy company active in Nordic and Baltic countries.

*“As long as you have a water-based heating circuit in your building (which basically all bigger buildings in Sweden have), the connection is easy,”* he explains. *“A heat exchanger is placed in the basement which connects the district heating system to the building’s heating system.”* The system uses biofuels – wood chips, wood pellets and bio-oil – as well as household waste and recovered heat from the city’s data centres and industries. It also draws energy from the sea using large heat pumps, Rylander said.

Further south in Spain, where heating is mostly required only in the winter months, winning public acceptance for the need to install district systems has been more difficult. The involvement of citizens is a key issue for smart city initiatives, said José Ramón Martín-Sanz García, energy efficiency engineer at Veolia, a partner in a Spanish project near Valladolid. *“One of the biggest challenges was convincing homeowners that it was necessary. It required a communication plan,”* he said. (4)

Scotland's Second Consultation on Local Heat & Energy Efficiency Strategies, and Regulation of District and Communal Heating closes on 21st Feb <https://consult.gov.scot/energy-and-climate-change-directorate/lhees-and-dhr2/>

## Geothermal

In the search for low carbon heat sources, geothermal heat is one solution. Of course, the UK is not characterised the tectonic activity seen in Iceland and New Zealand. But abandoned deep mines do have a good geothermal potential. Abandoned coal mines seem incredibly promising due to their networks of flooded galleries and shafts lying at depths of up to several hundred metres below the surface. One can be almost certain that the water flow necessary for deep geothermal wells will be found in these flooded underground voids.

Scientists at Durham University estimate that the abandoned mines of the UK contain around two billion cubic metres of water at temperatures which are constantly around 12-16°C, and in some instances higher still. If heat corresponding to a 4°C temperature drop was removed from this volume, around 38,500TJ of heat could be liberated. This conservative estimate could provide enough heat for around 650,000 homes nationally.

Clearly, you wouldn’t want to take a bath or heat your home with water at these low temperatures, but using a heat pump, the water temperature could be upgraded to more useful temperatures of

40-50°C. Given the low temperatures involved, the heat source needs to be close to the end user to minimise losses. Many UK towns and cities grew due to their coal reserves, meaning that centres of heat demand and areas of abandoned mines often coincide, making them ideal targets. The UK government's fifth carbon budget sets out plans to decarbonise heat by stating that one in 20 homes should be connected to a heat network by 2030. This is an ambitious challenge but abandoned mines could make a significant contribution here.

Minewater district heating schemes have already been successfully developed at several locations, including in Nova Scotia and the Netherlands. (5)

A £9.4m project, modelled on schemes in the Netherlands where mine water has been heating homes since 2008, is being established in a Welsh Valleys village in Bridgend. The scheme described as "trailblazing" would use underground mine water from the workings of the old Caerau colliery, which closed in the late 1970s, to heat houses, a school and a church in Caerau in the Llynfi Valley, South Wales. The Welsh Government has awarded the project £6.5m in EU funds. Bridgend County Borough Council is investigating how water in the colliery's underground workings, which has been heated by the earth and is a geothermal source of energy, could be extracted using heat pump technology and a network of pipes to warm around 150 nearby homes. Test drilling carried out at the Old Brewers site in Caerau found the mining void is full of water to a depth of 230 metres. The results of a feasibility study to determine if the water is warm enough to heat homes is expected by the end of February. The British Geological Survey has been involved in testing the temperature, chemistry and volume of the mining water, with the temperature expected to be around 20.6 C – warm enough for the scheme to be a success.

The Welsh cabinet secretary for energy, planning and rural affairs, Lesley Griffiths, said the project would be the first of its kind on such a scale in the UK. While the initial heat network will involve 150 properties and the nearby school and church, there may be potential for the scheme to warm up to a thousand local homes, a spokeswoman for the Welsh Government added. (6)

Small-scale housing projects in Glenalmond Street, Shettleston, and Lumphinnans, Fife, use water from disused mines to provide heat to a small number of houses. (7)

The Scottish Government is investing £1.8 million from the Low Carbon Infrastructure Transition Programme in a new geothermal heating system that will provide low cost, renewable energy for the new homes being built on the former Johnnie Walker bottling plant site in Kilmarnock.

The Low Carbon Infrastructure Transition Programme Geothermal Energy Challenge Fund announced on 14<sup>th</sup> June 2015 that it would support feasibility studies exploring the capacity of Scotland's geothermal resource to meet the energy needs of local communities. 4 projects were awarded a total of £185,235 feasibility funding to explore the potential of the geothermal resource in sites in Fife, North Lanarkshire, Aberdeen City and Aberdeenshire. The feasibility studies were published in March 2016. A synthesis of the four feasibility studies was published in June 2017. (8)

The feasibility studies summarised in the report propose four different technologies for extracting geothermal energy in Scotland: a single well recirculation system (AECC); a minewater extraction system (Fortissat); a single well extraction system (Guardbridge); and a double well

extraction/reinjection circulation system (Hill of Banchory). Each of these has inherent challenges and opportunities, and the studies demonstrate feasibility to different degrees. All the projects would lead to savings in CO<sub>2</sub> emissions of similar scales and roughly proportionate to their displacement of fossil fuel usage.

Taken as a whole, the four studies indicate that geothermal heat can have a useful role in the energy mix in Scotland and there is a range of potentially viable options. The deployment of geothermal heat in Scotland will require site-specific assessment; feasibility studies such as these are a necessary first step. Demonstration projects would help to reduce uncertainty and encourage wider use of geothermal resource in Scotland.

## Green Gas

Scottish Gas Networks (SGN) says it believes Gas will have a role to play beyond 2050 and is working hard to take carbon out of gas and demonstrate it has a long term future as part of a sustainable energy mix. SGN says greening the gas that passes through the networks is at the heart of its vision.

A report prepared by KPMG for the Energy Networks Association (ENA) has shown the injection of green gas such as hydrogen into the grid offers significant cost savings compared to a move to alternative heating sources. Converting the UK to hydrogen gas could be £150bn to £200bn cheaper than rewiring British homes to use electric heating powered by lower-carbon sources. However, it could still mean a £170 hike in annual gas bills by 2050. Crucially, KPMG said hydrogen heating would be the least hassle for energy customers because very few appliances would need to be replaced. The existing gas grid would need only minor upgrades because it was originally designed for hydrogen before the North Sea boom provided a flood of cheap natural gas to burn instead. The plan is a crucial part of efforts to cut carbon from heating, which makes up almost a fifth of the UK's total carbon emissions, because hydrogen produces only water vapour and heat when burned - with no carbon emissions.

SGN says it is leading the way in the development of green gas and was the first gas distribution company to inject biomethane into the network at Didcot in Oxfordshire. SGN is a leading partner in the UK's first and longest running commercial biomethane project at Poundbury in Dorset, and also Scotland's first biomethane production facilities in Coupar Angus, Perth and Girvan, South Ayrshire. It is also now part of the H21 project to convert Leeds to hydrogen.

SGN reported in February to the Scottish Parliamentary Renewable Energy and Energy Efficiency Group that it is planning a trial using hydrogen in the gas network in Aberdeen, Fife and Machrihanish. SGN favours using electrolysis to extract hydrogen from water using surplus renewable energy, rather than a process called 'steam reforming' which would only reduce carbon emissions if there were a very efficient carbon capture and storage system in place.

On 12<sup>th</sup> February 2018, the Scottish Government, in an FoI response, detailed research into the feasibility of the potential of decarbonising the gas network using hydrogen, in Scotland here: <https://beta.gov.scot/publications/foi-18-00041/>

UK Energy networks are preparing to dilute Britain's natural gas grid with low-carbon hydrogen for the first time in a radical bid to cut emissions from the country's heating system. Within weeks, a

consortium of grid operators and experts will begin safety work in 130 homes and businesses before blending hydrogen into the methane-rich gas which has been used to heat British households and companies for over 50 years. For over a year National Grid's gas network spin-off Cadent Gas and Northern Gas Networks have studied plans to pipe hydrogen directly into the natural gas grid in partnership with Keele University. The Hydeploy consortium plans to inject enough hydrogen to fill 20% of the gas grid, before rolling out the project across larger areas. Blending hydrogen across the whole of the U K could save 6m tons of carbon every year, or the equivalent of removing 2.5m cars from the roads. (9)

## Hydrogen for Transport

When the UK Transport Secretary, Chris Grayling was hauled in front of the Transport Select Committee to answer questions on the government's decision to scrap a number of major rail electrification projects, he said he wants the first hydrogen trains to operate on our rail network within a short period of time. Hydrogen trains could prove to be an effective answer to the problem presented by dirty diesel trains. Hydrogen has plenty of low carbon benefits. It can be produced using excess variable renewable power, it can play a role in the decarbonisation of road transport, rail transport, heating, and perhaps one day even aviation, it can be stored for long periods, and it can be integrated relatively easily into current refuelling models and infrastructure. There are lots of reasons to welcome the government's interest in the technology. (10) Trials of a hydrogen-powered train developed by Alstom of France started in Germany last year.

Hydrogen has so far lagged behind battery technology in the race to become the dominant form of energy storage. Increasingly large batteries are being integrated into power grids to mitigate the volatility of renewable generation. The growing global fleet of battery-powered electric vehicles could also help balance supply and demand — if recharging is done when power is plentiful. Yet, hydrogen has several advantages. Whereas batteries are heavy and require supplies of scarce lithium and cobalt, hydrogen is the lightest and most abundant known element in the universe. It produces nothing but water as a byproduct when used to produce electricity. Enthusiasts say that, even if EVs end up dominating the passenger car market, the greater energy density of hydrogen will make fuel cells a better option for heavier transportation, such as trucks, ships and trains. (11)

Now a hydrogen fuel cell small car is being developed in Wales by Riversimple which could revolutionise the car industry. (12) The Rasa is a radical, ultra-light two-seater powered by a hydrogen fuel cell. This year, the company will roll out a beta test of 20 cars in Monmouthshire and if all goes well. The car should be on the market in 2019. The car can do 0-60mph in 10 seconds - the equivalent of a Ford Fiesta - and has a range of around 300 miles. But it does that on just 1.5kg of hydrogen, compared with 5kg for Toyota's hydrogen car, the Mirai. (13)

## Anaerobic Digestion (AD)

Charlotte Morton, Chief Executive of the Anaerobic Digestion & Bioresources Association (ADBA), says Anaerobic Digestion is currently delivering 45 MWe of power and 11,000 m<sup>3</sup>/hr of heat in Scotland. The Scottish Government's Energy Strategy notes that biogas and biomethane produced through AD will have a role to play in helping to decarbonize Scotland's energy system, and notes

that existing biomethane sites in Scotland already produce enough gas to supply the equivalent of approximately 85,000 homes. (14)

A plant that generates power from Edinburgh householders' food waste has been acquired by London-based private equity investors in a move that shows confidence in the renewable energy technology. Ancala Partners bought the Millerhill anaerobic digestion facility from Kelda Water Services for an undisclosed sum. Millerhill uses discarded food collected by the City of Edinburgh and Midlothian councils and waste from businesses to generate enough electricity to power around 3,300 homes. (15)

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  2. Scotsman 26th Dec 2017 <https://www.scotsman.com/news/opinion/andy-yuill-heating-scotland-in-a-warming-world-1-4646038>
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## 9 Floating Turbines

Ministers have been warned that the UK risks forfeiting leadership in floating offshore wind turbines because of a withdrawal of subsidies. At least two proposed floating wind farms off Scotland will not go ahead unless a subsidy scheme due for expiry in October is extended. Floating turbines, anchored to the seabed by cables, can be deployed in deeper and windier waters further offshore. The first floating wind farm, the 30MW Hywind project off Aberdeenshire, operated by Statoil of Norway, opened last October. Three more are under development with combined planned investment of £425m. Two of these - the 60MW Forthwind and 10MW Dounreay Tri projects - will not be generating electricity in time to meet an October deadline to qualify for a form of subsidies known as Renewables Obligation Certificates (Rocs). RenewableUK, which represents the UK wind industry, is lobbying for an 18-month extension of the deadline to April 2020. *"Without this first group of projects we will not be able to build UK expertise and that would be a huge lost opportunity,"* said Maf Smith, deputy chief executive of RenewableUK. (1)

Statoil has reported that its Hywind project has outstripped expectations in its first three months of production. The wind farm worked at 65% of its maximum capacity between November and January. The average capacity factor for a fixed-bottom array is 45-60% during those months, according to the company. (2)

*"Some people thought we were crazy when we put a giant wind turbine on top of a floating spar structure and towed it out to sea"*. The inspiring story of floating turbines can be watched here:

<https://www.youtube.com/watch?v=PUIfvXaISvc>

A project run by a German-American company called Younicos is aiming to deliver a 1MW energy storage system to Hywind which will 'learn'. The Batwind partners, Statoil and Abu Dhabi renewable energy company Masdar, want the battery to automatically know when to store electricity, and when to release it out to the grid. (3)

Statoil believes the success of the Hywind Scotland project could lead to others being placed in areas of deeper water, including in the north Atlantic. According to Calum Iain MacIver, director of development at Western Isles Council, the prospect of further developments *"opens up opportunities for the seas around the Outer Hebrides, where the wind resource is possibly unparalleled"*. (4)

A new study will examine whether building more floating wind farms could boost the Scottish economy. The £50,000 project will look into scenarios modelling differing scales of development, and how Scottish firms could benefit from the burgeoning technology. The Crown Estate Scotland is leading the group overseeing the study which includes its English counterpart, The Crown Estate, as well as Scottish Renewables, RenewableUK and the Offshore Wind Industry Council. The report is expected to be published in summer. (5)

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## 10 Renewables and Jobs

Gary Smith, secretary of GMB Scotland says recent events at Burntisland Fabrications (BiFab) have brought the issue of jobs in renewable energy into focus. We've seen a spectacular growth in energy projects but where are the jobs? BiFab builds platforms for offshore wind turbines and tidal generators, as well as large-scale equipment for the offshore oil and gas industry. It employs more than 600 people.

The Beatrice wind farm project is a case in point. The £2.6 billion development is funded by SSE, Copenhagen Infrastructure Partners and the Chinese-owned Red Rock Power. Fewer than 4 per cent of that value has gone back into Scottish manufacturing. BiFab produces jackets for just one third of the wind farm's turbines. How has this happened? A fundamental problem is investment. The prospect of manufacturing 21st-century technology in 20th-century yards is not one that appeals to energy multinationals and their backers. We need manufacturing investment so we can compete on a level playing field with international competitors. (1)

Former Energy Minister Brian Wilson said what happened with BiFab is only the symptom of a far more serious problem which remains entirely unresolved. It might be called "*Whatever happened to Scotland's Second Industrial Revolution?*" In other words, how on earth have we ended up getting so little economic benefit out of renewable energy? The sad sub-text to the BiFab story is as follows. Scotland, at present, has only one large offshore wind project under construction, though the Beatrice windfarm has a value of £2.6 billion. It has been in gestation for almost 20 years. Yet the only substantial part of that work being carried out in Scotland is a £100 million sub-contract, and we can't even get that right. (2)

There are hopes for a 300 renewable energy jobs boom at Nigg Energy Park on the Cromarty Firth if ambitious plans to diversify from the oil and gas industry to offshore renewables come to fruition. (3) Highland councillors approved plans to expand the Energy Park. The extension would include new facilities for building and painting components for marine renewable power schemes. These include offshore wind turbines and tidal energy machines. (4)

Data from the Office for National Statistics (ONS) reveals jobs in offshore wind were up 300 per cent to 2000 against a major drop in headcount in solar projects in 2016. The 75 per cent reduction takes headcount in that area to just 500 in the wake of Westminster subsidy cuts announced one year

earlier. Meanwhile, around 8000 people are employed in onshore wind. Scottish Renewables, warned: "*The rise in employment in the offshore wind and renewable heat sectors illustrates the huge boost to jobs and investment that is possible when technologies are given the right backing by government. For these benefits to continue and grow, the whole industry needs to see that level of political commitment. The decline in employment in the solar industry shows clearly the impact of cuts to UK Government support for the sector. We would expect that future editions of this ONS survey will show declines in other areas caused by similar decisions made at Westminster.*" (5)

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**April 2018**

## 11 Scotland's Climate Change Plan

The Scottish Government has published a new climate plan covering the period 2018 to 2032. It is the third to be published since Scotland's Climate Change Act was first passed in 2009. (1) It follows a draft plan released in January 2017 for consultation.

The plan sets Scotland's strategy for reducing its greenhouse gas emissions by 66% compared to 1990 levels by 2032. This target was set by the Scottish Parliament in accordance with the Scottish Climate Change Act.

The plan particularly targets emissions reductions from transport, industry and buildings. A major part of the plan to reduce transport emissions planned phase-out of new petrol and diesel cars or vans by 2032, eight year earlier than the equivalent UK government target. The government also promises to introduce low-emissions zones in Scotland's four biggest cities, electrify 35% of Scotland's rail network, as well as ensure a third of the ferries owned by the Scottish government are low carbon by 2032.

The plan significantly lowers ambition on reducing emissions from buildings, compared with the draft plan. The previous target was to have 80% of domestic buildings' heat supplied using low carbon technologies by 2032, but this has been reduced to 35% of homes to be heated by low-

carbon technologies (including heat supplies by low-carbon electricity). Emissions from buildings will fall 23% over the lifetime of the plan, whereas the draft wanted to see a 75% drop in emissions.

The plan also promises the government will publish a route map setting a long-term ambition for the development of “Scotland’s Energy Efficiency Programme” (SEEP) in 2018.

Sarah Beattie-Smith, climate and energy policy officer at WWF Scotland and part of the Existing Homes Alliance called the new target is “desperately unambitious”. She says: *“When the Scottish government back in 2015 declared that energy efficiency would be a national infrastructure priority, we all cheered...But what we’ve actually been seeing is the same amount of money going in towards energy efficiency that we get every year.”* (2)

Scotland’s current Climate Change Act sets a target to reduce emissions by at least 80% by 2050 compared to 1990 levels. However, in its proposed Climate Change Bill, which would amend the 2009 Act, the Scottish government has put forward a more ambitious 90% target for emissions reduction by 2050.

Stop Climate Chaos Scotland has been calling for a 100% target for 2050.

The plan includes the commitment for 50% of all of Scotland’s energy needs to be delivered by renewables by 2030. Jenny Hogan, deputy chief executive of Scottish Renewables, welcomed the confirmation of the 2030 target. But she added: *“We are however disappointed to see a significant drop in ambition in decarbonising the heat sector, with the majority of effort pushed back to after 2025. The carbon targets for both the heat and transport sectors are lower than those recommended by the government’s independent advisors, the Committee on Climate Change.”* (3)

The Scottish government is due to unveil the new climate bill, which is likely to apply from 2021, in May or June this year. If the 2050 target is changed, the government would then need to produce a new climate change plan.

Caroline Rance of FoE Scotland said the Plan contained some welcome measures, including important steps forward in tackling transport emissions. Halting the sale of new fossil-fuelled cars and vans in Scotland by 2032 and introducing low-emission zones in our cities. She is also pleased to see that the Plan no longer relies on carbon capture and storage - a technology that hasn't yet been proven to work at scale. However, the main move forward came not from government action, but a leg up from new science. Experts now understand that Scotland's forests are able to soak up more greenhouse gases from the atmosphere than previously thought - balancing out some of our emissions. Rather than making the most of this to boost its ambitions, the Government has chosen to cut back on several targets. (4)

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6. The Climate Change Plan Meeting the Emissions Reduction Targets 2018-2032 The Third Report on Proposals and Policies Written statement laid before the Scottish Parliament pursuant to section 35 of the Climate Change (Scotland) Act 2009 <https://beta.gov.scot/publications/climate-change-plan-third-report-proposals-policies-written-statement-9781788516778/documents/00532181.pdf>

1. Carbon Brief 2<sup>nd</sup> March 2018 <https://www.carbonbrief.org/analysis-scotland-plans-climate-change-targets>

2. STV 28th Feb 2018 <https://stv.tv/news/scotland/1409323-government-publishes-ambitious-climate-change-plan/>
3. The National 17th March 2018 [http://www.thenational.scot/news/16093727.Scotland\\_can\\_join\\_world\\_leaders\\_in\\_tackling\\_climate\\_change\\_if\\_we\\_act\\_faster/](http://www.thenational.scot/news/16093727.Scotland_can_join_world_leaders_in_tackling_climate_change_if_we_act_faster/)

## 12 Scottish Investment Bank

A national investment bank created for Scotland would make at least £2 billion of financing available to companies. A blueprint by Benny Higgins, the head of the advisory committee looking into whether the institution is needed, was published in February. The money would be provided for everything from small loans to micro-businesses to tens of millions of pounds of so-called patient capital for longer term investments.

Mr Higgins, the outgoing chief executive of Tesco Bank, said that Scotland was particularly underserved in providing funding of between £1 million and £10 million. Legislation would be needed to create the Scottish National Investment Bank. It would also need to pass state aid tests from the European Union and meet other regulatory compliance measures. Helping Scotland transition to a low-carbon economy and investing in renewable energy technologies were cited as possible sectors the bank could invest in.

Times 1st March 2018 <https://www.thetimes.co.uk/article/plan-for-national-investment-bank-with-2bn-funds-by-2020-2qhdpwv6>

## 13 Hunterston B

Hunterston B Reactor 3 was taken offline on 9 March for a graphite inspection outage as agreed with the ONR and will involve inspection of the reactor core as well as a range of other maintenance and inspection work which can be carried out while the unit is offline. (1) The reactor was originally expected back online on 30th March, but at the time of writing this had been extended to 6<sup>th</sup> April.

Similarly, Hunterston's sister reactor - Hinkley Point B reactor 3 - was taken offline on 2nd February for its planned interim maintenance and graphite inspection. During the 16 day programme, 26 channels were successfully inspected in the reactor core to confirm its expected safe condition. The unit was successfully returned to service on 19th February. EDF said the findings underlined that the graphite is behaving as predicted, and we therefore remain confident in plant lifetime forecasts. [Each reactor core is made up of around 6,000 blocks - 3,000 of these are graphite bricks containing fuel channels] which are all connected together.

EDF Inspector General's report on Nuclear Safety and Radiation Protection (3) noted the higher frequency of inspections of the graphite in those AGRs most affected by cracks. These inspections are becoming increasingly important as the reactors approach the end of their service life.

The Inspector says characterisation of cracks in the graphite bricks of AGR cores is the key factor in determining their length of service life (the oldest reactors - Hunterston B and Hinkley Point B - came online in 1976). Regular inspections tailored to each reactor remain an essential means of ensuring there are no fast-developing cracks and of re-evaluating methods of control. In 2017, three new keyway root cracks were reported in two of the three reactors inspected. The total number of cracks remains well below the limits specified in the safety case for each reactor.

In the UK, EDF Energy will soon have to make some key decisions regarding the life extension and subsequent final shutdown of the AGRs in its fleet. In the meantime it is clear that as these AGRs get older EDF Energy will have to nurse them along quite carefully with more frequent outages for inspections and lower overall output. Reactor 4 at Hunterston is currently operating at a nominal full load at 496MW, whereas when it first opened it would have been around 660MW.

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1. Station Director, Colin Weir's letter to SSG Members 12<sup>th</sup> March 2018  
[https://www.edfenergy.com/sites/default/files/ssg\\_letter\\_12\\_march\\_2018.pdf](https://www.edfenergy.com/sites/default/files/ssg_letter_12_march_2018.pdf)
  2. Hinkley Point B March Community Newsletter.  
[https://www.edfenergy.com/sites/default/files/hinkley\\_b\\_community\\_newsletter\\_february.pdf](https://www.edfenergy.com/sites/default/files/hinkley_b_community_newsletter_february.pdf)
  3. See [https://www.edf.fr/sites/default/files/contrib/groupe-edf/producteur-industriel/nucleaire/enjeux/securite-des-installations/securite-des-salaries/rapport\\_igsnr\\_2017\\_-\\_uk.pdf](https://www.edf.fr/sites/default/files/contrib/groupe-edf/producteur-industriel/nucleaire/enjeux/securite-des-installations/securite-des-salaries/rapport_igsnr_2017_-_uk.pdf)

## 14 Torness

Reactor One at Torness nuclear power station was shut down because of a build-up of seaweed on 1<sup>st</sup> March until 5<sup>th</sup> March during some of the coldest weather this winter. EDF Energy said: "Reactor 1 was manually shutdown due to increased seaweed levels as a result of the weather conditions in the area ... at certain times of year with particular weather conditions in this part of the Forth Estuary, seaweed volumes can increase and enter the station's cooling water intake system."

Edinburgh Evening News 4th March 2018 <https://www.edinburghnews.scotsman.com/news/seaweed-forces-shutdown-of-nuclear-reactor-1-4700250>

## 15 Dounreay

### Particles

A leading independent nuclear expert has called for increased monitoring of a Caithness beach after an "alarming" radioactive fragment was found. Dr John Large said the situation was "serious" and could threaten local communities. The tiny particle of reprocessed fuel from Dounreay was discovered to contain radioactive americium. Dr Large said it's the first recorded presence of the so-called "daughter of plutonium" in nuclear waste washed up on Sandside beach. He said: "Monitoring

needs to be stepped up because there is a real risk these particles could end up in areas of population.”

If ingested, americium-241 can work its way into the bones, liver and, in males, the testicles, and remain in the body for some time. Sand-sized fragments of irradiated nuclear fuel were flushed into the sea from Dounreay in the 1960s and 1970s. Particles of irradiated nuclear fuel were first detected on the Dounreay site coastal strip in 1983 and on the beach at Sandside in 1984. Work to recover particles from the seabed was done between the 1990s and 2012. (1)

### Fast Reactor Raffinate

Work has begun on dealing with a highly radioactive liquid that has been stored in tanks at Dounreay. The raffinate was produced as a result of reprocessing spent fuel produced by the Prototype Fast Reactor (PFR). The work that has started involves turning the liquid into a solid by mixing it with materials including cement, ash and lime. Before solidifying, the waste will be poured into drums.

Dounreay said the process would create “a solid, passively safe waste package” for long-term storage. The site’s waste director, Sam Usher, said: “With similar liquid waste from two of Dounreay’s reactors already made safe, this is the last piece of the jigsaw and probably our highest single remaining hazard.” All the PFR raffinate is expected to be processed within the next five years. (2)

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1. Press & Journal 8th March 2018 <https://www.pressandjournal.co.uk/fp/news/highlands/1429664/world-nuclear-expert-calls-for-increased-monitoring-of-caithness-beach/>
  2. BBC 3<sup>rd</sup> March 2018 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-43263152>

## 16 Local Energy

**Highland Council** is to invest £2.3 million in building a range of small solar farms across its estate after agreeing on a scheme that aims to make more than £4 million for the council over 20 years. The council’s current plans would see 2.5MW of solar built, comprising ten 250kWp arrays built on land that according to Councillor Bob Lobban, chairman of the authority’s redesign board, could not be used for anything else.

Solar Power Portal 9th March 2018

[https://www.solarpowerportal.co.uk/news/highland\\_council\\_aims\\_for\\_4\\_million\\_return\\_from\\_building\\_its\\_own\\_solar\\_farm](https://www.solarpowerportal.co.uk/news/highland_council_aims_for_4_million_return_from_building_its_own_solar_farm)

**North Ayrshire Council** has approved a plan to install rooftop solar on up to 500 properties in its housing stock to save residents up to £115 within the first year. An initial consultation on the £1.6 million solar panel initiative identified 1,100 council properties in North Ayrshire which could benefit from the installations. The council will now contact these homes again to gauge their interest, with additional properties considered for inclusion on a first-come, first-served basis up to a limit of 500

installations. The council hopes to install the solar panels at no charge to the residents by the autumn, with the potential for the scheme to be further rolled-out if successful.

Solar Power Portal 29<sup>th</sup> March 2018

[https://www.solarpowerportal.co.uk/news/council\\_turns\\_to\\_solar\\_to\\_tackle\\_fuel\\_poverty\\_for\\_500\\_houholds](https://www.solarpowerportal.co.uk/news/council_turns_to_solar_to_tackle_fuel_poverty_for_500_houholds)

The Building Research Establishment (BRE) has launched a brand **new solar carport guide** with the intent of stimulating the market. The guide, entitled '*Multifunctional Solar Car Parks: A good practice guide for owners and developers*', aims to provide an outline of key factors required for the business cases behind solar car parks, including details relating to site selection, design and development. The new document follows on from the BRE's good practice solar car parks guide published two years ago, but updates some of the guidance to include further applications of energy storage and electric vehicle charging points and how they be incorporated into the design and development stage.

Solar Power Portal 8th March 2018

[https://www.solarpowerportal.co.uk/news/new\\_bre\\_solar\\_car\\_park\\_guide\\_uncovers\\_solar\\_storage\\_and\\_ev\\_potential](https://www.solarpowerportal.co.uk/news/new_bre_solar_car_park_guide_uncovers_solar_storage_and_ev_potential)

The old brewery site at **Fountainbridge in Edinburgh** is looking at how to use the huge sewage network underground to generate heat and energy. The technology has already been proven at the Scottish Borders College with most of its annual heating and hot water demands being met. Plans for Fountainbridge could deliver energy for more than 750 homes using the same kind of technology. Heat which would otherwise go to waste can be used to heat the entire development. Not only that, but existing buildings in the area can also link in – like the new Boroughmuir School and developments around Lochrin Basin.

Edinburgh Evening News 19th Feb 2018

<https://www.edinburghnews.scotsman.com/news/fountainbridge-is-poised-to-lead-way-on-sewage-energy-1-4691587>

Residents of the **Isle of Canna** off the west coast of Scotland have secured £1.3m to largely ditch their diesel power generators in favour of a new community-owned renewable electricity system based on solar PV, wind, and battery storage technologies. Construction of the off-grid renewable energy system is due to start in April and is expected to take around seven months to complete, after which profits from the power generated will be used to cover operation and maintenance costs, and reduce bills for local homes and businesses. The existing diesel generators will continue to be leased to islanders, but it is hoped that upwards of 90 per cent of their electricity needs will be met by the PV panels and six small onshore wind turbines being built on the island. The community has established its own enterprise – Canna Renewable Energy and Electrification Ltd (CREEL) – to own and operate the new equipment. Funding was secured from the Big Lottery Fund, the Scottish Government's Community and Renewable Energy Scheme, SSE Highland Sustainable Development Fund, Highlands and Islands Enterprise and the National Trust for Scotland.

Business Green 19<sup>th</sup> March 2018 <https://www.businessgreen.com/bg/news/3028670/scottish-islanders-secure-gbp13m-for-community-renewables-system>

Fuel poor homes in Scotland could benefit from a new community-owned onshore wind farm set to open in **East Lothian** later this year, under an innovative new Scottish government-backed scheme. Claimed to be one of the first deals of its kind in Scotland, the Pogbie onshore wind farm has been financed using a deal structure that supports not-for-profit energy supplier Our Power's aims to tackle fuel poverty. The financing deal has secured £13m of debt funding to allow the acquisition and development of the Pogbie site, backed by a range of stakeholders including Mongoose Energy, Close Brothers Leasing and the Scottish Investment Bank's Renewable Energy Investment Fund (REIF), which is supported by the Scottish Government. Once completed later this year, the 12-turbine wind farm will boast a total capacity of 9.6MW, and under the financing deal net surpluses from the project are earmarked for the benefit of communities suffering fuel poverty and other local causes, Our Power said.

Business Green 13th March 2018 <https://www.businessgreen.com/bg/news/3028293/fuel-poor-scottish-homes-to-benefit-from-96mw-community-wind-project>

## 17 Hydrogen

A ferry powered by hydrogen manufactured by community-owned wind turbines has been proposed. Point and Sandwick Trust, operators of the community-owned Beinn Ghrideag Wind Farm on the Isle of Lewis, is leading the project. The project's partners include CMAL, owners of Caledonian MacBrayne Ferries; Ferguson Marine shipyard in Glasgow, Siemens Gamesa Renewable Energy, ITM Power, one of the world's leading specialists in hydrogen manufacture, ENGIE, specialist in the transport and storage of gas, Wood, a global leader in the delivery of projects, engineering and technical services to energy and industrial markets, and Johnston Carmichael, Scotland's largest independent firm of chartered accountants. The feasibility study, which has been awarded £700,000 by the Scottish Government, will look at the manufacture of the hydrogen using local wind power, the challenges of how to handle, transport and store the hydrogen on local piers, and how the design of the ship and its engines needs to be adapted to run on hydrogen fuel.

BBC 21st Feb 2018 <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-43140326> and Press & journal 22nd Feb 2018 <https://www.pressandjournal.co.uk/fp/news/islands/1419853/worlds-first-sea-going-hydrogen-ferry-serve-western-isles/>

A team from Heriot-Watt University has developed a new technique for creating hydrogen fuel using sunlight. Before the "hydrogen economy" can fully develop, it first has to be economical. Hydrogen can be produced using fossil fuels, which adds to CO<sub>2</sub> emissions. Another, cleaner method appears simple: harvest energy from the sun using solar cells, then pass the resulting electricity through water. The water splits cleanly into hydrogen and oxygen. It's called PEC - photoelectrochemical water splitting.

BBC 26th March 2018 <http://www.bbc.co.uk/news/uk-scotland-43534972>

## 18 Onshore Wind

Energy and Clean Growth Minister Claire Perry has signalled that onshore wind and solar projects will be allowed to compete for subsidies in a future Contract for Difference (CfD) auction. (Although the Renewable Energy Industry is encouraging its supporters to lobby Tory MPs – particularly Scottish ones to make sure it happens).

BEIS excluded established renewable technologies, onshore wind and solar, from last year's CfD auction, but Perry now says that an auction including these so-called Pot 1 technologies is in the pipeline. The Conservative manifesto for last year's general election maintained the government's bar on new onshore windfarms in England but kept the door ajar for such projects in areas of Scotland and Wales where they enjoy public support.

Meanwhile, the European Commission has told the UK government it will not block moves to allow wind farm projects on the Scottish islands to enter the next CfD auction. The government applied for state aid approval to classify remote island wind as a separate technology in Group 2 of the next round of the CfD auction, which is set to go ahead in the spring of 2019. (1)

### Feed-in Tariffs

The announcement earlier this month that one of the small and medium wind industry's best-known companies - Gaia-Wind based in Glasgow - was going into liquidation is the starkest warning yet that the renewable energy sector urgently needs action by government on the Feed-in Tariff (FIT). Gaia has manufactured nearly 2,000 small wind turbines for the UK market as well as exporting globally - most notably to Tonga. But Gaia-Wind is now just one of a number of UK companies working in the renewable energy sector facing an uncertain future due to government inaction over the Feed-in Tariff scheme. The FiTs is due to close to new applicants just one year from now, but there is no sign from government about what, if anything, will replace it. This is a problem for companies trying to plan for the future of their business. Gaia-Wind may prove to be the tip of the iceberg as innovative UK companies, tired of waiting, pack up or move abroad. (2)

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1. Edie 26<sup>th</sup> March 2018 <https://www.edie.net/news/11/Onshore-wind-and-solar-could-compete-for-subsidies-in-CfDs/>
  2. Business Green 5th April 2018 <https://www.businessgreen.com/bg/opinion/3029577/what-future-for-the-feed-in-tariff>