

Written evidence submitted by the Grantham Research Institute on Climate Change and the Environment

The Grantham Research Institute on Climate Change and the Environment is a multidisciplinary research centre established in 2008 at the London School of Economics and Political Science. Further information about the Institute can be found at: www.lse.ac.uk/grantham.

The Institute welcomes the opportunity to respond to the Environmental Audit Committee's call for evidence on accelerating the transition from fossil fuels and securing energy supplies. This submission has been prepared by Bob Ward and Eléonore Soubeyran.

Executive summary

- The current cost of living crisis and increased risks to energy security in the UK is primarily due to our dependence on fossil fuels, particularly imports.
- To tackle the immediate crisis, the Government should be focusing on efforts to reduce the consumption of fossil fuels, particularly by accelerating energy efficiency measures.
- To reduce the probability of future crises, the Government should accelerate the transition away from fossil fuels through the development and deployment of clean domestic energy.
- The Government's refusal to rule out future exploration for oil and gas is inconsistent with its ambition to 'keep 1.5 alive' as President of COP26.

Question 1. How effective will the Government's Energy Security Strategy be: at reducing reliance on oil and gas at the pace required to limit global heating to 1.5°C ; securing alternative energy supplies; and protecting households from high fossil fuel prices?

1. The Government's British Energy Security Strategy, which was published on 7 April 2022, is unlikely to make any additional significant difference to reduce household bills in the short term. The Strategy misses the opportunity to markedly reduce the consumption of fossil fuels, particularly imports, the higher prices of which are directly responsible for increasing the cost of electricity, heating and transport.
2. In particular, the Strategy does not contain any new measures to improve energy efficiency of homes and businesses, which could be implemented relatively quickly and would reduce energy bills. Many households are still paying for electricity and heating which is wasted through poor insulation and inefficient appliances. For instance, the latest data published by the Office for National Statistics show that the median energy efficiency score for dwellings in England was 66 and 64 in Wales for all records up to March 2021, which is equivalent to band D. This is an urgent challenge that requires the leadership of the UK Government and self-evidently cannot just be left to the market to solve.
3. The Government should develop a national strategy for a rapid and effective roll-out of improvements to energy efficiency infrastructure across the UK, drawing on the expertise and resources of the new UK Infrastructure Bank, and working partnership with local authorities and the private sector. The Government must learn the lessons from the difficulties encountered during past initiatives, including the Green Homes Grant, and focus on making the 'customer journey' as simple and straightforward as possible. The Government should remember that energy efficiency represents the 'low-hanging fruit' of climate policy options as it largely pays for itself through lower energy costs for homes and businesses.

Question 2. Should Government policies on onshore energy generation or exploration be revised in light of the energy security situation? Given the current and potential speed of deployment, what low-carbon energy sources are most likely to secure supplies of affordable and sustainable energy rapidly?

4. The UK is exposed to both volatile prices and energy security risks because of its dependence on imports of oil, gas and coal. And its consumption of both domestic and overseas supplies of fossil fuels is causing emissions of greenhouse gases that are damaging lives and livelihoods around the world, and creating impacts that threaten the UK's national security, as was explicitly acknowledged in March 2021 by the publication of the Government's Integrated Review of Security, Defence, Development and Foreign Policy. The only sensible solution to these threats to the UK is to accelerate the transition away from fossil fuels towards clean domestic sources of energy. Indeed, the crisis that the UK currently faces is at least partly due to the fact that there has not been faster progress on improving energy efficiency and deploying renewables, particularly onshore wind.
5. The British Energy Security Strategy notes that the planning process for new renewables projects has been slowing down the rate of deployment. The Strategy states that the Government "will not introduce wholesale changes to current planning regulations for onshore wind but will consult this year on developing local partnerships for a limited number of supportive communities who wish to host new onshore wind infrastructure in return for benefits, including lower energy bills". This is sensible. It must be recognised that some home-owners do face real costs associated with the location of nearby wind turbines. Research by Stephen Jarvis shows that the localised and fragmented nature of the UK's planning process has potentially increased the cost of the UK's deployment of wind power to date by £8–23 billion, or around 10–29 per cent.
6. Some have tried to argue that the UK would not be facing the same rise in energy bills and concerns about energy security if the Government had not introduced a moratorium on hydraulic fracturing for shale gas in 2019. The evidence indicates that this is not true. Projections published in March 2019 by United Kingdom Onshore Oil and Gas (UKOOG), representing the onshore oil and gas industry and the wider supply chain, show (Chart 5, page 13) that it would take about 15 years to reach peak annual production rates. Although UKOOG has been unwilling to share the figures on which its projections are based, its press office has suggested that they show that by Year 3 the most optimistic estimate would be 57 billion cubic feet per year. The United States Energy Information Administration estimates that the 27 Member States of the European Union and the UK together imported an average of about 9 billion cubic feet per day of liquefied natural gas in 2021. Hence UK production of shale gas under the most optimistic scenario would be equivalent this year to much less than 2 per cent of annual imports of liquefied natural gas by the European Union and UK in 2021. This would make no significant difference to the market price or to bills. A study by Warwick Business School published in March 2020 calculated from the industry's assumptions that UK production of shale gas could meet between 17 and 22 per cent of UK cumulative consumption between 2020 and 2050. It stated that "should the UK wish to have a shale gas industry its role will be to mask the declining production of the UK [continental shelf] and displace a limited quantity of imports". It added: "It will not be a UK shale gas revolution, but rather an exercise in slowing the increase in import dependence, thereby improving the UK's Balance of Payments".

Question 7. How can Government phase out support for fossil fuels whilst most effectively supporting households through the transition?

7. The clean energy transition will impact workers and supply chains in high-emitting industries, as well as local communities. As such we support the four key messages of the Scotland's Just Transition Commission (2021) to ensure a just transition away from fossil fuels, that is:
 - a) Pursue an orderly, managed transition to net-zero that creates benefits and opportunities for people.
 - b) Equip people with the skills and education they need to benefit from the transition to net-zero.
 - c) Empower and invigorate our communities and strengthen local economies.
 - d) Share the benefits of climate action widely; ensure costs are distributed on the basis of ability to pay.

Question 8. Can the UK's oil and gas reserves be exploited while limiting global temperature rises to 1.5°C in line with the Paris Agreement?

8. The Strategy exposes the lack of consistency between the Government's plans for the potential expansion of domestic production of oil and gas and its leadership as President of COP26, at the heart of which was a pledge to 'keep 1.5 alive' (ie limiting the rise in global mean surface temperature to no more than 1.5°C) and to encourage countries to set targets to achieve net zero emissions of greenhouse gases by 2050. In its landmark report on 'Net Zero by 2050' in May 2021, the International Energy Agency concluded: "There is no need for investment in new fossil fuel supply in our net zero pathway". It stated: "Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway, and no new coal mines or mine extensions are required".
9. The Strategy does not acknowledge the findings of the International Energy Agency but instead argues: "There is no contradiction between our commitment to net zero and our commitment to a strong and evolving North Sea industry". It indicates that the North Sea Transition Authority will launch another licensing round for oil and gas in the autumn "taking into account the forthcoming climate compatibility checkpoint and the need for energy security". It is understandable that the Government is more aware of energy security risks following Russia's illegal invasion of Ukraine, even though just four per cent of the natural gas consumed by the UK in 2021 was imported from Russia. It is worth noting that other countries that are major producers of fossil fuels and which have set national targets for net zero emissions by 2050, such as the United States, have also continued to encourage fossil fuel exploration. However, it could be expected that the UK, as COP26 President, would recognise the inconsistency of its current policies. It could, for instance, convene a meeting of the countries that produce fossil fuels to discuss how existing reserves might be managed and remain unexploited in line with the stated ambition to limit global warming to no more than 1.5°C. In principle, the UK could develop new oil and gas fields without undermining the 1.5C target if it was able persuade other producers to leave some of their current reserves in the ground. Instead, the British Energy Security Strategy risks undermining the effort to 'keep 1.5 alive' because it potentially means that the UK will contribute to an oversupply of fossil fuels in the future, depressing the price and making them seem more competitive against some cleaner alternatives. However, it is more likely that any new oil and natural gas fields that might be developed as a result of the Government's encouragement risk becoming stranded assets as the North Sea is a mature basin with relatively high operating costs, and so the new fields would struggle to compete on global markets against sources that have lower costs, particularly as demand around the world falls as a result of climate policies.

10. The British Energy Security Strategy claims that “[i]n meeting net zero by 2050 we may still use a quarter of the gas that we use now”, and “[a]s a result of our plans, the North Sea will still be a foundation of our energy security but we will have reduced our gas consumption by over 40% by 2030”. These are difficult to reconcile with the Government’s own projections. The Net Zero Strategy published in October 2021 ahead of COP26 in Glasgow includes a projection (Figure 14, page 81) of energy demand to 2037 along its “indicative delivery pathway”. The spreadsheet on which this figure was based revealed that demand for energy from natural gas was projected to fall from 757.1 terawatt-hours (TWh) in 2021 to 471.7 TWh in 2030 and 289.2 TWh in 2037. This would mean a 37.7 per cent fall between 2021 and 2030. These figures were changed on the website of the Department for Business, Energy and Industrial Strategy (BEIS) in April 2022 ahead of the publication of the British Energy Security Strategy. The new figures show that demand for energy from natural gas would fall from 800.3 TWh in 2021 to 520.1 TWh in 2030 and 357.1 TWh in 2037. This would mean a fall of 35.0 per cent between 2021 and 2030. The emissions projections team at BEIS suggested that the primary reason for the upward revision was because the original figures included in the Net Zero Strategy had omitted energy demand for natural gas that would be consumed with carbon capture, utilisation and storage (CCUS). It has not been possible to persuade the team to share figures showing explicitly how much energy demand from natural gas has been assumed in the new projections, but it should be noted they are higher by 43.2 TWh in 2021, 48.4 TWh in 2030 and 67.9 TWh in 2037. The emissions projection team did draw attention to a further spreadsheet on the BEIS website that provides projections of total electricity generation by source, showing that CCUS technologies are expected to start being used for electricity generation in 2026, increasing to 16 TWh in 2030 and 38 TWh in 2037. These include bioenergy with carbon capture and storage (BECCS), and not just natural gas with CCUS, but it is clear that they cannot explain the adjustment of the net zero projections. The credibility of the Government’s Net Zero Strategy and British Energy Security Strategy does depend on the extent to which they are consistent with official projections. One possible conclusion is that the Government is not yet willing to admit that it is now assuming much greater deployment of CCUS in order to ensure that expected natural gas consumption from domestic and overseas sources remains compatible with the statutory carbon budgets and net zero target. According to the Net Zero Strategy, “engineered removals” of greenhouse gases are expected to “deploy from 0 MtCO₂ today to at least 5 MtCO₂ by 2030 and to around 23 MtCO₂ by 2035, with higher and lower deployment possible depending on sector-specific and wider economy developments”.

Question 9. Is carbon capture and storage technology sufficiently mature to be deployed at scale in the necessary timescale? What economic opportunities are there in carbon capture in the North Sea? What risks are there to relying on carbon capture technologies?

11. CCUS will need to be deployed in the UK and across the world to reach net zero. In most scenarios published by the UK Climate Change Committee for meeting net zero, including the Balanced Net Zero Pathway, half or more of the carbon dioxide captured in 2050 relates to greenhouse gas removal technologies. Global rates of CCUS deployment are far below what is needed to limit global warming to 1.5°C or 2°C (IPCC, 2022b). In the UK, BECCS and direct air carbon capture and storage (DACCS) are only in pilot or earlier development stages. An inconsistent policy environment has previously set back CCUS development, and the UK now needs to make up for years of stalled progress in deploying this essential technology. Recent policy developments including the Government’s stated ambition to capture and store 20-30 Mt CO₂ a year by 2030 have encouraged industry (CCSA, 2022). Focus should therefore shift from waiting until the CCUS technology is sufficiently mature, to deploying it so that it matures in the necessary timescale. In fact, according to an assessment by the Royal Society (2018), estimates of technology readiness levels for BECCS and DACCS are relatively high, and there are already

operational CCUS facilities with dedicated storage in Canada, Norway and the United States (IEA, 2020).

12. Focusing immediate efforts on deploying CCUS to abate emissions for which renewable-based mitigation technologies currently do not exist or are prohibitively expensive (e.g. heavy industry) would allow the industry to establish the experience and infrastructure needed to enable carbon dioxide removal technologies to be up and running in the UK by 2030, in line with net zero goals. A delayed deployment of CCUS technologies risks increasing the costs to society in terms of climate impacts. This would be a missed opportunity for the UK supply chain if other countries are faster to establish comparative advantage.
13. There are real economic opportunities from transferring the UK's capabilities in offshore oil and gas operations into CCUS to establish a comparative advantage in the development of this technology. Indeed, places that have specialised in oil and gas extraction technologies are well-placed to benefit from the transition to CCUS (Serin et al, 2021). CCUS can create new net-zero aligned jobs, with many concentrated in the UK's industrial areas which have long been a focus for regional development policies. It can unlock significant export opportunities for the UK supply chain, in particular for CCUS-related services, given it currently successfully exports relevant expertise in related industries, notably the oil and gas sector. Further, the UK holds a considerable amount of known capacity for geological storage of carbon dioxide in Europe which can create an opportunity to export 'storage as a service'. However, CCUS technologies should complement, not replace greenhouse gas mitigation. While CCUS can help offset some technologically or economically hard-to-abate emissions (e.g. from aviation, marine transport), the deployment of this technology cannot be used to delay the transition away from fossil fuels. The UK Climate Change Committee has confirmed that even with a significant role for CCUS, total UK gas consumption must decrease rapidly over the next (CCC, 2022).
14. Barriers to CCUS investment remain across five different types of capital: infrastructure/ physical capital, knowledge capital/innovation, human, natural and social capital (Serin et al, 2021). Policy risk operates across these five types of capital and therefore need to be carefully managed to avoid policy failures that can deter investment, as occurred following the cancellation of the two CCUS competitions in the UK. In addition, many CCUS projects will be the first of a kind and might not meet expectations.

Question 11. Is the North Sea Transition Deal structured appropriately to meet net zero goals and support a 'just transition' for those working within the oil and gas sector in the UK? Is there sufficient independent oversight of the Deal?

15. The North Sea Transition Deal takes a positive step forward for a just transition but could be enhanced. Although the Deal documentation claims that "people are at the core of the deal", this is only true metaphorically, through welcome measures for skills, and not in practice. Further measures for participation would grant affected people a meaningful voice on how the Deal progresses. The model should be one of cooperation, not just consultation or information-sharing (Wuppertal Institute, 2022). One area this should be applied is in training, standards, and an integrated workforce plan, which should be co-designed between OPITO, the energy industry skills body, and trade unions; it must have workstreams and final provisions to eliminate discrimination, including by gender.
16. Furthermore, while governance structures in place for the Deal as a whole (primarily the North Sea Transition Forum) do include trade union representatives, the government should explore options for how to allow affected communities to give input: not just the people with jobs in the industry, but also those whom the value chain supports directly in other ways. This is important

to include people who are too often excluded by such high-level processes – typically the most vulnerable groups – and is essential to support gender representation given the sector's substantial gender deficit. Options could include regular citizen panels that the Forum is required to observe, discuss and address, or official representation on the Forum itself. Investors should also be included in the North Sea Transition Forum. Recent efforts to engage investors with utility companies by providing a framework (Robins, 2021) have influenced companies like SSE to publish their own just transition strategy (SSE, 2020), which shows that investors should be part of the solution.

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References

- Carbon Capture and Storage Association [CCSA] (2022) *CCUS Delivery Plan 2035*.
- Climate Change Committee [CCC] (2022) *Letter: Climate Compatibility of New Oil and Gas Fields*.
- Her Majesty's Government (2021a) *Net Zero Strategy: Build Back Greener*
- Her Majesty's Government (2021b) *Global Britain in a competitive age: The Integrated Review of Security, Defence, Development and Foreign Policy*
- International Energy Agency (2020) *CCUS in Clean Energy Transitions*. Paris.
- International Energy Agency (2021a) *Net Zero by 2050: A Roadmap for the Global Energy Sector*. Paris.
- International Energy Agency (2021b) *World Energy Investment 2021*. Paris.
- IPCC (2022) *Summary for Policymakers*. In: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA.
- Jarvis S (2021) *The economic costs of NIMBYism: evidence from renewable energy projects*. London School of Economics and Political Science.
- Just Transition Commission (2021) *A national mission for a fairer, greener Scotland*.
- Office for National Statistics (2021) *Energy efficiency of housing in England and Wales: 2021*
- Robins N, Muller S, Szwarc K (2021) *From the grand to the granular: translating just transition ambitions into investor action*. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science.
- Royal Society (2018) *Greenhouse gas removal*.
- Serin E et al (2021) *Seizing sustainable growth opportunities from carbon capture, usage and storage in the UK*. London: Centre for Climate Change Economics and Policy, Grantham Research Institute on Climate Change and the Environment and Centre for Economic Performance, London School of Economics and Political Science.
- Solman N, Bradshaw M (2020) *Briefing: Shale Gas and UK Energy Security*. Warwick Business School.
- SSE (2020) *Supporting a Just Transition*.
- United Kingdom Onshore Oil and Gas (2020) *Updated shale gas production scenarios*.

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United States Energy Information Administration (2022) Three countries provided almost 70% of
liquefied natural gas received in Europe in 2021. *Today in Energy*, 22 February 2022.

Wuppertal Institute (2022) *Just Transition Toolbox for coal regions*.