General Perspectives on the Law of Energy Transition in the United Kingdom

Chitzi C. Ogbumgbada and Kate McKenzie

A. Introductory Comments

The energy transition in the UK is commonly conceived as a transition to net zero.[1] This conception is primarily based on the 2008 Climate Change Act, a significant piece of legislation enacted by the British Parliament that grounds climate action in the UK.[2] Transitioning to net zero mainly involves reducing greenhouse gas emissions in the atmosphere to an insignificant volume through measures like deploying renewable energy, reducing energy consumption across society, implementing energy efficiency measures, and utilising carbon sinks. The aim is to prevent the worst effects of climate change from manifesting in this century. Nevertheless, there are issues associated with the transition to net zero, even though the transition is urgent and relevant.[3] In the UK, there is a question about how the energy transition can accommodate energy security, a concept that is interpreted by policymakers in the country as mainly ensuring that British households and businesses obtain energy at affordable prices, eliminating impediments against energy supply to the country, protecting means of livelihood dependent on fossil fuels, and lessening the impact of climate policies on the vulnerable.[4] Amidst these questions is the continuing role of domestic and international law and policy in helping to deliver net zero in a timely and urgent manner.

Following this brief introduction, this chapter begins by examining the UK's decarbonisation strategy as enunciated in its Nationally Determined Contribution (NDC) under international law and further considers its relevance for domestic energy law. It will discuss the national energy mix,

1 HM Government, *Net Zero Strategy: Build Back Greener* (HH Associates Ltd 2021).
2 Thomas L. Muinzer, *Climate and Energy Governance for the UK Low Carbon Transition: The Climate Change Act 2008* (Palgrave Macmillan 2019) 2.
3 See Daniel Yergin, *The New Map: Energy, Climate, and the Clash of Nations* (Penguin Books 2021).
4 HM Government, *Powering up Britain: Energy Security Plan* (HH Global 2023).

highlighting and examining the energy sources that provide electricity in the UK and how these align with the decarbonisation strategy. The chapter will further discuss the trade-offs inherent in deploying climate-compliant policies and facilitating energy security. It will then conclude with remarks about possible future trends in the energy transition in the UK.

B. Decarbonisation Strategy and Implication for Energy Law

In line with Article 4 of the Paris Agreement, the UK communicated its NDC to the United Nations Framework Convention on Climate Change (UNFCCC) in December 2020. It undertook to reduce economy-wide greenhouse gas emissions by at least 68 % by 2030, compared to 1990 levels.[5] Following COP26, which the UK hosted in Glasgow, the UK subsequently communicated an updated NDC that took account of the urgency of strengthening climate change response measures up to 2030.[6] Each NDC is based on five-year carbon budget cycles that were first introduced in the Climate Change Act 2008,[7] making the UK the first major economy to create legally binding targets to reduce greenhouse gas emissions to net zero by 2050.[8] The 2008 Act originally committed the UK to reducing its emissions by 80 % over 1990 levels by mid-century. The UK updated this target in 2019, increasing its ambition to reduce all GHG emissions by 100 % (achieving net zero) by 2050.

The UK's NDC and its Net Zero Strategy discuss emissions on a UK-wide ('whole of UK') basis, but a complicating factor for the UK is that it is made up of several devolved governments (Scotland, Northern Ireland, and Wales), as well as multiple Crown Dependencies and Overseas Territories. Each of the devolved governments has its own statutory GHG emissions reduction targets and decarbonisation strategies, which are outlined in the UK's NDC.[9] Complicating matters further, under the UK's Climate Change Act, the scope of emissions covered is limited to those emitted

5 See HM Government, *United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution* (HH Associates Ltd 2022) 1.

6 ibid.

7 HM Government, Expert Participation, 'Climate Change Act 2008' <https://www.legislation.gov.uk/ukpga/2008/27/contents> accessed 21 February 2024.

8 HM Government, *Net Zero Strategy: Build Back Greener* (n 1) 39.

9 HM Government, *United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution* (n 5) s 3(c).

in the UK and UK coastal waters. Therefore, the 'whole of UK' approach does not include emissions from UK Crown Dependencies and Overseas Territories in UK carbon budgets.[10] Broadly, the UK's 2020 (updated 2022) NDC commits the UK to a 68 % reduction of greenhouse gas emissions over 1990 levels, clarification about how the UK's NDC aligns with the Paris Agreement's temperature goal, as well as information on levelling up, public engagement, just transition, and green skills.[11]

The UK's *Net Zero Strategy: Build Back Greener*[12] outlines the policies and proposals needed to decarbonise the UK economy across all sectors to meet net zero by 2050, and it was submitted to the UNFCCC as the UK's second Long-Term Low GHG Emissions Development Strategy under the Paris Agreement.[13] The Net Zero Strategy indicates an economy-wide approach to greenhouse gas emissions reductions and outlines the reductions needed in each sector between 2020 and 2037.[14] While the Net Zero Strategy is quite ambitious, it is highly dependent on the development, availability, and deployment of key technologies such as low-carbon electricity generation and storage technologies, hydrogen production, carbon capture usage and storage (CCUS), and biomass carbon removal.[15]

1. Scope of the UK's NDC

The overall scope and coverage of the UK's NDC include an overall net reduction in greenhouse gas emissions across all sectors of the economy, excepting international aviation and shipping emissions.[16] The territorial scope of the UK's NDC is limited to the emissions and removals from England, Scotland, Wales and Northern Ireland, as well as those Crown Dependencies and Overseas Territories to which the UK's ratification of the Paris Agreement has been extended.[17] While the UK's NDC includes a

10 ibid 6.
11 ibid 3.
12 HM Government, *Net Zero Strategy: Build Back Greener* (n 1).
13 UNFCCC 'Long-Term Strategies Portal' <https://unfccc.int/process/the-paris-agreement/long-term-strategies> accessed 14 March 2024.
14 HM Government, *Net Zero Strategy: Build Back Greener* (n 1) 18.
15 ibid 69.
16 HM Government, *United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution* (n 5) s 3(c).
17 ibid.

'whole of UK' economy-wide greenhouse gas emissions reduction strategy, most aspects of climate change and decarbonisation are matters for the various devolved governments, each of which has a different approach to decarbonisation and net zero.[18] The overall UK approach is outlined in the Net Zero Strategy, which is based on the Climate Change Act 2008 (2050 Target Amendment) Order 2019[19] and includes the UK's legally binding target of 100 % emissions reduction by 2050.[20]

The overall Net Zero Strategy, first published in October of 2021, builds on wider UK government policies, including the ten-point plan for a green industrial revolution[21] and several sector-specific policies including the British Energy Security Strategy (applies to England, Wales, and Scotland),[22] the Transport Decarbonisation Plan (mostly applies to the whole of the UK),[23] the Industrial Decarbonisation Strategy[24] to reduce industrial emissions across the UK, the Hydrogen Strategy (applies to the UK), and the Heat and Buildings Strategy[25] to decarbonise homes, commercial, industrial, and public sector buildings (some policies are specific to England only).

18 HM Government and the Devolved Administrations of Scotland, Wales, and Northern Ireland, Collaboration 'Net Zero Government Initiative – UK Roadmap to Net Zero' 4.

19 HM Government, 'The Climate Change Act 2008 (2050 Target Amendment) Order 2019' <https://www.legislation.gov.uk/uksi/2019/1056/contents/made> accessed 14 March 2024.

20 The Scottish Government published its updated climate change plan in April 2023, the Welsh government published its updated net zero plan and target in April 2022, and Northern Ireland published its Path to Net Zero Energy in December 2021.

21 HM Government, 'The Ten Point Plan for a Green Industrial Revolution' (*GOV.UK*, 18 November 2020) <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution> accessed 14 March 2024.

22 HM Government, 'British Energy Security Strategy – Secure, Clean and Affordable British Energy for the Long Term' <https://www.gov.uk/government/publications/british-energy-security-strategy> accessed 26 February 2024.

23 HM Government, 'Transport Decarbonisation Plan' (*GOV.UK*, 12 January 2023) <https://www.gov.uk/government/publications/transport-decarbonisation-plan> accessed 14 March 2024.

24 HM Government, 'Industrial Decarbonisation Strategy' (*GOV.UK*, 7 April 2021) <https://www.gov.uk/government/publications/industrial-decarbonisation-strategy> accessed 14 March 2024.

25 HM Government, 'Heat and Buildings Strategy' (*GOV.UK*, 1 March 2023) <https://www.gov.uk/government/publications/heat-and-buildings-strategy> accessed 14 March 2024.

The decarbonisation pathways set out in the UK's NDC translate to important changes and updates to energy law. The policies and proposals outlined in the UK's Net Zero Strategy: Build Back Greener cover the UK government's approach to each sector, including power, fuel supply and hydrogen, industry, heat and buildings, transport, natural resources, water and fluorinated gases, greenhouse gas removals, and public sector decarbonisation. The impact of the UK's NDC on energy law is best demonstrated by considering the amendments to a broad set of other regulations and bills, which are captured in the Energy Act (2023), set out below.

2. The Energy Act (2023)

First and foremost, the Energy Act (October 2023) is aimed at delivering cleaner energy that is more affordable and leads to long-term energy security.[26] Not surprisingly, the energy system in the UK is governed by a range of legislation, and the Energy Act (2023) amends several of these, including the Nuclear Installations Act 1965, the Enterprise Act 2002, the Energy Act 2004, the Energy Act 2008, the Gas Act 1986, the Rights of Entry (Gas and Electricity Boards) Act 1945, the Electricity Act 1989, the Petroleum Act 1998, the Utilities Act 2000, the Energy Act 2013, the Energy Act 2016, and the Heat Networks (Scotland) Act 2021, as well as the Climate Change Act 2008, which the Act amends to broaden the scope of GHG removals and the type of removal methods beyond land use.[27]

While the Energy Act (2023) is UK-wide legislation, provisions have effect primarily in England, Scotland, and Wales (i.e. Great Britain), with some provisions extending also to Northern Ireland. However, according to convention Westminster, the seat of the UK government, will not typically legislate on matters that fall within the competence of the devolved governments and instead will seek legislative consent of the developed legislatures under the Sewel Convention.[28]

---

26 HM Government, 'Energy Act 2023' <https://www.legislation.gov.uk/ukpga/2023/52/enacted> accessed 14 March 2024.

27 Department for Energy Security and Net Zero, 'Energy Bill [HL] Explanatory Notes' 28 <https://publications.parliament.uk/pa/bills/cbill/58-03/0295/en/220295en.pdf> accessed 14 March 2024.

28 HM Parliament, 'Sewel Convention' <https://www.parliament.uk/site-information/glossary/sewel-convention/> accessed 14 March 2024. To illustrate this complexity, the Scottish Government retains devolved power for onshore oil and gas licensing

Parts 1 and 2 of the Energy Act cover carbon capture, transport, and storage, as well as hydrogen production. This includes a government commitment to develop four new Carbon Capture Usage and Storage (CCUS) clusters by 2030. The UK government sees this as an area of economic regulation because operators of carbon-related pipeline transport and storage networks (often regional monopolies responsible for a broad range of network users, emitters and providers) will be licensed by an economic regulator granting the right to charge customers for delivery and operation of their network.[29] The Office of Gas and Electricity Markets (Ofgem) is given duties and functions under Part 1 of the Act to act as the economic regulator of CO_2 transport and storage, along with an economic licensing framework for such activities.[30] Authority for regulating the secure geological storage of CO_2 will remain with the Oil and Gas Authority (OGA)[31] and the relevant ministers of the devolved nations, as set out in the Energy Act 2008.[32] The UK government recognises the challenges of decarbonising industrial and commercial activities without viable alternatives and has committed to providing financial assistance to support such industries.[33]

Part 2 of the Energy Act establishes new powers to provide financial assistance, to establish the necessary frameworks, and the duties and responsibilities needed to manage contracts with CCUS entities and low carbon hydrogen producers. Based on consultations undertaken in 2021 under the auspices of the British Energy Security Strategy,[34] Part 2 of the Energy Act includes powers to appoint a future administrative body that would oversee a competitive process, along with powers to raise levies to fund and support a range of pathways that will facilitate hydrogen usage in a range of sectors.[35]

---

but does not have the power to tax oil and gas, nuclear energy regulation is reserved for the UK Government, but nuclear waste management remains devolved. Paul Cairney et al., 'How to Conceptualise Energy Law and Policy for an Interdisciplinary Audience: The Case of Post-Brexit UK' (2019) 129 Energy Policy 459, 462.

29 Department for Energy Security and Net Zero (n 27) 11 f.

30 HM Government, 'Energy Act 2023' (n 26) pt 1.

31 The OGA is now known as the North Sea Transition Authority (NSTA), which regulates the UK petroleum industry. See NSTA, 'About' <About Us – The North Sea Transition Authority (nstauthority.co.uk)> accessed 14 March 2023.

32 Department for Energy Security and Net Zero (n 27) 12.

33 ibid 11.

34 HM Government, 'British Energy Security Strategy – Secure, Clean and Affordable British Energy for the Long Term' (n 22).

35 HM Government, 'Energy Act 2023' (n 26) pt 2.

The Energy Act therefore also addresses the necessary new technologies, including low-carbon heat schemes, hydrogen trials, and fusion energy. Part 3 of the Energy Act takes into account the 2021 Heat and Buildings Strategy,[36] the Hydrogen Strategy[37], and the Net Zero Strategy[38] in order to transition away from fossil fuel-based energy sources. The Energy Act, in Part 3, gives new powers to the Department for Energy Security and Net Zero's Secretary of State to create a scheme to increase the sale and installation of low-carbon heating technologies, such as heat pumps, which is also intended to grow the supply chain for such technologies via strengthened investment incentives.[39]

In order to determine the viability of large-scale hydrogen use in heat provision, the Energy Act includes measures that will allow a hydrogen trial to be safely and effectively operated in order to enable the UK Government to make strategic decisions around hydrogen use in decarbonising heat in buildings in 2026.[40] Part 3 also amends the Nuclear Installations Act 1965 to explicitly exclude fusion energy facilities, meaning these facilities will not require a nuclear site licence, enabling fusion energy facility regulation in a more appropriate and hazard-proportional manner.[41] It further extends the powers of the Secretary of State for Transport under the Energy Act 2004 to include a range of fuels that could support particularly the aviation industry in decarbonisation.[42]

Based on the UK Government's commitments in its Energy White Paper 2020[43] and the Future Systems Operator consultation response 2022,[44] Part 4 of the Energy Act establishes a public sector body, which will operate independently from the government and will take on many functions

36 HM Government, 'Heat and Buildings Strategy' (n 25).
37 HM Government, 'UK Hydrogen Strategy' (*GOV.UK*, 14 December 2023) <https://www.gov.uk/government/publications/uk-hydrogen-strategy> accessed 14 March 2024.
38 HM Government, *Net Zero Strategy: Build Back Greener* (n 1).
39 HM Government, 'Energy Act 2023' (n 26) paras 15–17.
40 Department for Energy Security and Net Zero (n 27) 13.
41 HM Government, 'Energy Act 2023' (n 26) para 21.
42 ibid 22.
43 HM Government, 'Energy White Paper: Powering Our Net Zero Future' (*GOV.UK*, 18 December 2020) <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future> accessed 14 March 2024.
44 HM Government, 'Proposals for a Future System Operator Role' (*GOV.UK*, 20 July 2021) <https://www.gov.uk/government/consultations/proposals-for-a-future-system-operator-role> accessed 14 March 2024.

currently carried out by operators licensed and owned by National Grid plc. This Independent System Operator and Planner (ISOP) is also given powers, duties and functions related to the development of an energy transition system for electricity and gas, as well as a range of additional net zero-related roles.[45] The findings of the Government's Energy White Paper 2020 further highlighted that the current system of energy code governance adversely impacts the transition away from fossil fuels because of insufficient incentives, conflicting interests, and an inability to adequately influence changes in the code. The Act, in Part 5, therefore establishes a new governance framework by giving Ofgem's decision-making board greater powers to influence necessary changes in gas and electricity industry codes.[46]

Part 6 of the Energy Act relates to market reform and consumer protection, including competitive tendering for electricity projects, electricity storage, energy company obligations, and smart meters. The UK Government's commitment to fully decarbonising the electricity system by 2035, while also meeting an expected significant increase in demand, requires substantial changes to the current system of privately owned electricity networks across Great Britain[47] which stifles innovation and creates information gaps. The Energy Act therefore extends the competitive process under the Electricity Act 1989 to allow for new investment opportunities, improved investment efficiency, and innovative flexible solutions that will increase network efficiency and reduce consumer costs.[48] The energy network in Great Britain is made up of network enterprises that are regional monopolies, meaning that price control is the primary method through which Ofgem, as the economic regulator, can control the cost of energy which is passed on to consumers. The Energy Act, in Part 6, further empowers the Competition and Markets Authority (CMA) to have greater oversight over mergers between energy network enterprises in order to ensure consumer protection within Great Britain.[49]

In a continued effort to protect consumers and decarbonise the electricity grid, the UK Government plans to double the current Multi-purpose

45 HM Government, 'Energy Act 2023' (n 26) pt 4.
46 Department for Energy Security and Net Zero (n 27) 14–15; HM Government, 'Energy Act 2023' (n 26) paras 27–29.
47 This Part of the Energy Act 2023 applies only to Great Britain (England, Scotland and Wales), and does not have an impact in Northern Ireland.
48 HM Government, 'Energy Act 2023' (n 26) paras 32–33.
49 ibid 6.

Interconnector (MPI) capacity of 7.4 gigawatts by working closely with developers, regulators, and European partners, and seeks to achieve 50 gigawatts of offshore wind generation by 2030.[50] Supporting interconnection is a core part of the UK Government's energy strategy and is intended to enhance system flexibility, reduce consumer price, and meet increased electricity demand while decarbonising the sector in a low cost manner.[51] Interconnectors, along with electricity storage technologies and demand side responsiveness, are expected to help build needed flexibility into an energy system that includes high volumes of low carbon heat and power. Since the current electricity regulatory framework is not equipped to deal with some of the new technologies, such as electricity storage, Part 6 of the Energy Act 2023 is also intended to provide increased clarity by formalising electricity storage as a distinct subset of electricity generation.[52] The Act also gives energy suppliers more flexibility in meeting their obligations under the Energy Company Obligation (ECO) scheme, including protections that meet the Government's commitment to creating a fair and competitive market that reduces market distortion and undue financial constraints on smaller suppliers.[53]

Part 7 of the Energy Act 2023 covers heat networks, which are crucial to the UK's decarbonisation plans and are the most cost-effective way to decarbonise heating.[54] Ofgem, as regulator, is given extended powers that cover heat networks to ensure fair pricing and reliable heating supply to consumers while increasing the proportion of UK heat and hot water provided to consumers through heat networks from 2 % to 18 % of the UK supply by 2050.[55] The Heat and Buildings Strategy,[56] along with the Net Zero Strategy[57] set out the Government's commitment to transform the heat network across the UK. The Energy Act 2023 enables this transformation via heat network zoning changes that will allow for increased

50 Department for Energy Security and Net Zero (n 27) 16–17.
51 HM Government, 'Energy White Paper: Powering Our Net Zero Future' (n 43).
52 HM Government, 'Energy Act 2023' (n 26) pt 6.
53 ibid; HM Government, 'Transitioning to a Net Zero Energy System: Smart Systems and Flexibility Plan 2021' (*GOV.UK*) <https://www.gov.uk/government/publications/transitioning-to-a-net-zero-energy-system-smart-systems-and-flexibility-plan-2021> accessed 14 March 2024.
54 Department for Energy Security and Net Zero (n 27) para 53.
55 HM Government, 'Energy Act 2023' (n 26) pt 7.
56 HM Government, 'Heat and Buildings Strategy' (n 25).
57 HM Government, *Net Zero Strategy: Build Back Greener* (n 1).

collaboration between local governments, industry, and local stakeholders to find lowest cost solutions for decarbonising the heating sector. The combined measures, including a government investment of £338 million in the Heat Network Transformation Programme, are expected to save 13.1 million tonnes of CO_2 emissions across the UK's carbon budgets covering 2023 to 2037.[58]

Further in line with the Government's commitments in the Smart Systems and Flexibility Plan (2021)[59] and the Energy White Paper 2020,[60] provisions in the Energy Act governing smart appliances and load control envision a reduction in costs of up to £10 billion a year by 2050.[61] Part 8 of the Act includes provisions that set regulatory requirement for energy smart appliances and smart functionality for EV charging points and demand side response activities.[62] The Act also includes new powers for the Secretary of State to make changes to the current Energy Performance of Buildings (EPR) regime as well as the Energy Savings Opportunity Scheme (ESOP). Parts 9 and 10 of the Act provide replacement powers to the Secretary of State which were previously derived from EU law, enabling the Government to amend, revoke or replace existing powers under the EPR and ESOP, respectively.[63]

Crude oil-based fuels currently provide heating to 1.5 million homes in the UK and provide over 90 % of the energy used in transport (i.e. the movement of people and goods), and the sector shows substantial risks to the resilience of these fuel supplies.[64] While the Government has shied away from full regulation of the sector, the Energy Act 2023 does include measures that are intended to improve the resilience of the sector as well as reducing the risk of disruption. These include powers to require maintenance or improvement, risk reduction, and information powers, all of which allow the Government to identify risks within the fuel supply market before the need to implement emergency powers.[65] To further offset the supply and use of crude oil-based energy, the Act provides

58 Department for Energy Security and Net Zero (n 27) 19–20.
59 HM Government, 'Transitioning to a Net Zero Energy System: Smart Systems and Flexibility Plan 2021' (n 53).
60 HM Government, 'Energy White Paper: Powering Our Net Zero Future' (n 43).
61 Department for Energy Security and Net Zero (n 27) para 56.
62 HM Government, 'Energy Act 2023' (n 26) pt 8.
63 Department for Energy Security and Net Zero (n 27) 20–22.
64 ibid 69 f.
65 HM Government, 'Energy Act 2023' (n 26) pt 11.

powers that are intended to increase the speed with which offshore wind electricity generation is enabled, including assessments of the impact on the marine environment and potential compensatory measures for damage.[66] The Department for Energy Security and Net Zero Secretary of State is also given powers to respond to policy changes necessary to achieve net zero, potential court judgments, and to implement learnings from possible future marine pollution incidents involving offshore oil and gas production.[67] The Act also makes amendments to the cost recovery connected to decommissioning activities in the offshore oil and gas sector in line with the polluter pays principle,[68] as well as the decommissioning of nuclear sites, geological disposal of nuclear waste beneath the seabed, and compensation for nuclear damage.[69]

While the Energy Act 2023 goes to great lengths to implement necessary changes and enable actions that will bring the UK closer to the targets outlined in its NDC, criticism remains. The primary criticism comes from the UK's Climate Change Committee (CCC), which publishes regular assessments of the UK's progress on its Net Zero Strategy. Most recently, the CCC has raised concerns that the UK Government's approach is neither timely nor sufficient. In its February 2024 assessment, the CCC indicates that the UK Government underestimates the increase in energy demand and the necessary related emissions reductions such an increase requires.[70] The CCC has made clear that the committee has lost confidence that the Government is on track to meet its commitments and targets, primarily due to its recently announced delay in its phase out of fossil fuel vehicles and in meeting its heat pump installation targets,, as well as insufficient deployment of renewable electricity production.[71]

The remaining criticism of the UK's decarbonisation strategy is an over-reliance on new technologies, the funding and enabling legislation

66 Department for Energy Security and Net Zero (n 27) para 74; HM Government, 'Energy Act 2023' (n 26) pt 12.

67 HM Government, 'Energy Act 2023' (n 26) pt 12; Department for Energy Security and Net Zero (n. 27) para 75.

68 Department for Energy Security and Net Zero (n 27) para 76; HM Government, 'Energy Act 2023' (n 26) pt 12.

69 HM Government, 'Energy Act 2023' (n 26) pt 13.

70 Tom Dooks, 'CCC Assessment of Recent Announcements and Developments on Net Zero' (Climate Change Committee, 12 October 2023) 1 <https://www.theccc.org.uk/2023/10/12/ccc-assessment-of-recent-announcements-and-developments-on-net-zero/> accessed 14 March 2024.

71 ibid 2–5.

for which is broadly included in the Energy Act 2023. The CCC asserts that nearly half of the UK Government's emissions reduction plans are insufficient or at risk of failing to meet the 2030 target,[72] while others have criticised the Government's approach as being too heavily reliant on yet unproven technologies that will enable continued reliance of fossil fuels instead of transitioning away from such sources of energy.[73]

C. The National Energy Mix

The energy mix is an integral part of the energy transition mainly because it is constituted by energy sources that could either hamper or accelerate the transition to net zero. In the UK, natural gas is crucial in providing electricity to households, businesses, and other users. However, its influence in recent years has been waning in favour of cleaner and less polluting energy sources.[74] In 2023, natural gas generated 32 % of the UK's electricity needs, establishing its dominance as the single largest energy source for the year.[75] Gas to the UK is mainly sourced from the UK Continental Shelf, located in the North Sea, and imports in the form of liquified natural gas. The dominance of natural gas is indicative of the current approach in the UK to utilise this form of fossil fuel as part of its long-term decarbonisation plan,[76] ostensibly because gas is often positioned as a transition fuel. Although natural gas remains prominent in the UK's energy matrix, nuclear energy usage is also significant. In 2023, it generated 14.2 % of electricity in the UK.[77] Despite these contributions from fossil fuels to electricity generation, the UK is increasingly generating electricity from zero-carbon energy sources, which has led to the rising prominence of renewable energy in the energy mix.

---

72 ibid 7.

73 Sam D. Stephenson and Julian M. Allwood, 'Technology to the Rescue? Techno-Scientific Practices in the United Kingdom Net Zero Strategy and Their Role in Locking in High Energy Decarbonisation Pathways' (2023) 106 Energy Research & Social Science 103314, 7.

74 Simon Evans and Verner Viisainen, 'Analysis: UK Emissions in 2023 Fell to Lowest Level Since 1879' (*Carbon Brief,* 11 March 2024) <https://www.carbonbrief.org/analysis-uk-emissions-in-2023-fell-to-lowest-level-since-1879/> accessed 14 March 2024.

75 National Grid ESO, 'Britain's Electricity Explained: 2023 Review' <https://www.nationalgrideso.com/news/britains-electricity-explained-2023-review> accessed 13 March 2024.

76 HM Government, *Powering up Britain: Energy Security Plan* 15 (n 4).

77 National Grid ESO (n 75).

In 2023, wind and solar generated 29.4 % and 4.9 % of Britain's electricity needs, respectively.[78] These figures represented an improvement over the previous year, when both sources generated 26.8 % and 4.4 % of electricity in the UK.[79] Although other renewable energy sources like hydro and biomass contributed to electricity generation in 2023, the attention on wind and solar is due to their nature as newer forms of renewable energy. The growth of these fuels in the energy mix has been mainly due to the UK's abundant reserves of the sources and the investments that have been made towards generating electricity from them. Their increasing importance now means fossil fuel usage in the UK is declining. Coal use, for example, has dropped considerably in the UK, generating only 1 % of electricity in 2023. While the use of renewable energy continues to grow, and fossil fuel usage continues to fall, it is difficult to predict whether this trend represents a long-term picture of the UK's energy transition or a short-term trend that could fade away. The trend can be better understood in the context of broader issues associated with the energy transition, in particular the conflict between ensuring that net zero leads to a more climate-compliant future and ensuring that the objective of energy justice is achieved.

D. Trade-offs and the Energy Transition in the UK

The scale of potential trade-offs to be made in the context of the energy transition arose in 2023 when the UK Government announced two key energy policies.[80] The first relates to the decision to grant over one hundred licences to petroleum companies to drill for oil and gas in the North Sea,[81]

78 ibid.

79 National Grid ESO, 'Britain's Electricity Explained: 2022 Review' <https://www.nationalgrideso.com/news/britains-electricity-explained-2022-review> accessed 14 March 2024.

80 Chitzi C. Ogbumgbada, 'The Tension Between Energy Security Objectives and Climate Change Obligations in Recent UK's Energy and Climate Policies: An Assessment' (2025) OGEL 1 <https://www.ogel.org/article.asp?key=4155> accessed 09 June 2025. The decisions were made by the Conservative government then in power.

81 HM Government, 'Hundreds of New North Sea Oil and Gas Licences to Boost British Energy Independence and Grow the Economy – Press Release' (*GOV.UK*, 31 July 2023) <https://www.gov.uk/government/news/hundreds-of-new-north-sea-oil-and-gas-licences-to-boost-british-energy-independence-and-grow-the-economy-31-july-2023> accessed 14 March 2024.

where domestic gas production in the country mainly occurs. According to the government, the policy will aid the UK to reduce its dependence on imported gas, ensure a sufficient supply of gas to British households, businesses, and other users at affordable prices and rates, and protect jobs in the hydrocarbons industry.[82] The Government thereafter introduced the Offshore Petroleum Licensing Bill before the British Parliament to boost the frequency of petroleum auction rounds in the UK.[83]

The second policy concerns adjusting key net zero targets, which the Government argues represents a pragmatic, proportionate, and realistic approach to the transition.[84] Part of the Government's rationale is that the UK, as a developed economy, has taken more onerous climate change mitigation burdens and significantly cut its GHG emissions compared to other developed countries. The new policy includes adjusting the ban on petrol and diesel cars from 2030 to 2035, allowing the installation of oil and liquified petroleum gas boilers and new coal heating in off-gas-grid homes; delaying the phase-out of gas boilers in place of heat pumps in British homes; scrapping the obligation on landlords to utilise energy efficiency measures in their rented property; and scrapping several other green initiatives like car sharing and flight reductions to reduce carbon footprints, among others.[85]

While these policies may be justified from an energy security perspective, they risk placing the UK in a difficult position, given its commitment to

82 ibid.

83 HM Government, 'New Annual Oil and Gas Licensing Rounds to Boost UK Economy, Energy Independence and Transition to Net Zero – Press Release' (*GOV.UK*, 8 November 2023) <https://www.gov.uk/government/news/new-annual-oil-and-gas-licensing-rounds-to-boost-uk-economy-energy-independence-and-transition-to-net-zero> accessed 14 March 2024. The bill is before the House of Lords after passing its Third Reading in the House of Commons on 20 February 2024. See Alan Walker, 'Offshore Petroleum Licensing Bill 2023–24: Second Reading' (House of Commons Library, 04 January 2024) <https://commonslibrary.parliament.uk/research-briefings/cbp-9924/> accessed 16
July 2024.

84 HM Government, 'PM Recommits UK to Net Zero by 2050 and pledges a "fairer" path to Achieving Target to Ease the Financial Burden on British Families – Press Release' (*GOV.UK,* 20 September 2023) <https://www.gov.uk/government/news/pm-recommits-uk-to-net-zero-by-2050-and-pledges-a-fairer-path-to-achieving-target-to-ease-the-financial-burden-on-british-families> accessed 14 March 2024.

85 ibid.

transition to net zero in 2050, an obligation that is rooted in both domestic and international law. It will take some time however before the full ramifications of these policies will unravel.

E. Concluding Remarks

The energy transition is underway in the UK, and the impact of several laws and policies is already apparent. The decarbonisation strategy and the rising prominence of clean sources of energy indicate that the transition to net zero has already begun. Nevertheless, questions remain, such as whether current policies are effective in delivering net zero in a timely and urgent manner. A further question relates to how the transition could accommodate energy security, an issue that will likely continue to dominate debates on the energy transition in the UK in the foreseeable future.

Bibliography

Department for Energy Security and Net Zero, 'Energy Bill [HL] Explanatory Notes' <https://publications.parliament.uk/pa/bills/cbill/58-03/0295/en/220295en.pdf> accessed 14 March 2024

Dooks T, 'CCC Assessment of Recent Announcements and Developments on Net Zero' (Climate Change Committee, 12 October 2023) <https://www.theccc.org.uk/2023/10/12/ccc-assessment-of-recent-announcements-and-developments-on-net-zero/> accessed 14 March 2024

Evans S and Verner V, 'Analysis: UK Emissions in 2023 Fell to Lowest Level Since 1879' (Carbon Brief, 11 March 2024) <https://www.carbonbrief.org/analysis-uk-emissions-in-2023-fell-to-lowest-level-since-1879/> accessed 14 March 2024

HM Government, Expert Participation, 'Climate Change Act 2008' <https://www.legislation.gov.uk/ukpga/2008/27/contents> accessed 21 February 2024

HM Government, *Net Zero Strategy: Build Back Greener* (HH Associates Ltd 2021)

HM Government, *United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution* (HH Associates Ltd 2022)

HM Government, *Powering up Britain: Energy Security Plan* (HH Global 2023)

HM Government, 'The Climate Change Act 2008 (2050 Target Amendment) Order 2019' <https://www.legislation.gov.uk/uksi/2019/1056/contents/made> accessed 14 March 2024

HM Government, 'Industrial Decarbonisation Strategy' <https://www.gov.uk/government/publications/industrial-decarbonisation-strategy> (GOV.UK, 7 April 2021) accessed 14 March 2024

HM Government, 'Heat and Buildings Strategy' <https://www.gov.uk/government/publications/heat-and-buildings-strategy> (GOV.UK, 1 March 2023) accessed 14 March 2024

HM Government, 'Energy Act 2023' <https://www.legislation.gov.uk/ukpga/2023/52/enacted> accessed 14 March 2024

HM Government, 'UK Hydrogen Strategy' <https://www.gov.uk/government/publications/uk-hydrogen-strategy> (GOV.UK, 14 December 2023) accessed 14 March 2024

HM Government, 'New Annual Oil and Gas Licensing Rounds to Boost UK Economy, Energy Independence and Transition to Net Zero – Press Release' (*GOV.UK*, 8 November 2023) <https://www.gov.uk/government/news/new-annual-oil-and-gas-licensing-rounds-to-boost-uk-economy-energy-independence-and-transition-to-net-zero> accessed 14 March 2024

HM Government, 'Hundreds of New North Sea Oil and Gas Licences to Boost British Energy Independence and Grow the Economy – Press Release' (GOV.UK, 31 July 2023) <https://www.gov.uk/government/news/hundreds-of-new-north-sea-oil-and-gas-licences-to-boost-british-energy-independence-and-grow-the-economy-31-july-2023> accessed 14 March 2024

HM Government, 'Proposals for a Future System Operator Role' <https://www.gov.uk/government/consultations/proposals-for-a-future-system-operator-role> (GOV.UK, 20 July 2021) accessed 14 March 2024

HM Government, 'Transitioning to a Net Zero Energy System: Smart Systems and Flexibility Plan 2021' (GOV.UK) <https://www.gov.uk/government/publications/transitioning-to-a-net-zero-energy-system-smart-systems-and-flexibility-plan-2021> accessed 14 March 2024

HM Government, 'Energy White Paper: Powering Our Net Zero Future' <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future> (GOV.UK, 18 December 2020) accessed 14 March 2024

HM Government, 'The Ten Point Plan for a Green Industrial Revolution' <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution> (GOV.UK, 18 November 2020) accessed 14 March 2024

HM Government, 'British Energy Security Strategy – Secure, Clean and Affordable British Energy for the Long Term' <https://www.gov.uk/government/publications/british-energy-security-strategy> accessed 26 February 2024

HM Government, 'Transport Decarbonisation Plan' <https://www.gov.uk/government/publications/transport-decarbonisation-plan> (GOV.UK, 12 January 2023) accessed 14 March 2024

HM Government, 'PM Recommits UK to Net Zero by 2050 and pledges a "fairer" path to Achieving Target to Ease the Financial Burden on British Families – Press Release' (GOV.UK, 20 September 2023) <https://www.gov.uk/government/news/pm-recommits-uk-to-net-zero-by-2050-and-pledges-a-fairer-path-to-achieving-target-to-ease-the-financial-burden-on-british-families> accessed 14 March 2024

HM Government and the Devolved **Administrations of Scotland, Wales, and Northern Ireland**, Collaboration 'Net Zero Government Initiative – UK Roadmap to Net Zero'.

HM Parliament, 'Sewel Convention' <https://www.parliament.uk/site-information/glossary/sewel-convention/> accessed 14 March 2024

Muinzer T L, *Climate and Energy Governance for the UK Low Carbon Transition: The Climate Change Act 2008* (Palgrave Macmillan 2019)

National Grid ESO, 'Britain's Electricity Explained: 2022 Review' <https://www.nationalgrideso.com/news/britains-electricity-explained-2022-review> accessed 14 March 2024

National Grid ESO, 'Britain's Electricity Explained: 2023 Review' <https://www.nationalgrideso.com/news/britains-electricity-explained-2023-review> accessed 13 March 2024

NSTA, 'About' <About Us – The North Sea Transition Authority (nstauthority.co.uk)> accessed 14 March 2023

Ogbumgbada C C, 'The Tension Between Energy Security Objectives and Climate Change Obligations in Recent UK's Energy and Climate Policies: An Assessment' (2025) OGEL 1 <https://www.ogel.org/article.asp?key=4155> accessed 09 June 2025.

Paul Cairney et al., 'How to Conceptualise Energy Law and Policy for an Interdisciplinary Audience: The Case of Post-Brexit UK' (2019) 129 Energy Policy 459

Stephenson S D and Allwood J M, 'Technology to the Rescue? Techno-Scientific Practices in the United Kingdom Net Zero Strategy and Their Role in Locking in High Energy Decarbonisation Pathways' (2023) 106 Energy Research & Social Science 103314

UNFCCC, 'Long-Term Strategies Portal' <https://unfccc.int/process/the-paris-agreement/long-term-strategies> accessed 14 March 2024

Walker A, 'Offshore Petroleum Licensing Bill 2023–24: Second Reading' (House of Commons Library, 04 January 2024) <https://commonslibrary.parliament.uk/research-briefings/cbp-9924/> accessed 16 July 2024

Yergin D, *The New Map: Energy, Climate, and the Clash of Nations* (Penguin Books 2021)