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article

Brexit implications for sustainable energy in the UK

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Brexit has potentially wide-ranging implications for UK policy, although little is known about what these are yet. Now, post the transition period, is a good time to consider its actual impacts as opposed to what was expected by academics, and by proponents of Brexit. In the absence of any established theory of EU-exit, and drawing on insights from (de-)Europeanisation, Brexit energy and climate policy studies, and political economy, this article develops a framework to identify the impact of EU-exit on UK energy policy. This is applied to sustainable energy, an area in urgent need of policy development to meet legally binding national targets. We conclude that, so far, despite leaving various EU bodies there has been relatively little divergence from Europeanised policy; that new UK energy and climate policies, required to replace EU membership benefits, are relatively less effective; and that hard-pressed civil servants have been drawn away from other important policymaking tasks.

Key words Brexit • sustainable energy policy • energy policy • climate change • Europeanisation • political economy • UK • EU

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Introduction

The Brexit political process has been ongoing for six years now and, although it is expected to have a range of implications for UK policy, there is little academic literature on what these are so far. Proponents of Brexit indicated several, somewhat general, intended impacts including: 'taking back control of our money, laws and

borders'; reducing bureaucratic burdens; and establishing new trading relationships (HM Government, 2018). In this article we identify, in a more detailed and sector-specific manner, what the impacts of Brexit have been for the UK's sustainable energy policy, at a highly crucial time in its development.

Analyses of Brexit policy impacts in climate change and energy policy, also written before the UK's exit, suggested some more specific implications: that Brexit might open UK policy up to greater voluntarism (Farstad et al, 2018; Armstrong 2018; Burns et al, 2019); that Brexit may make UK emissions reduction targets harder to reach (Clutton-Brock et al, 2016; Lockwood et al, 2017; Burns and Carter 2018; Farstad et al, 2018; Lockwood and Froggatt 2019); or even contribute towards a lessening of climate commitment (Farstad et al, 2018). What these insights into potential implications suggest is that Brexit is partly a balancing act for the UK: it needs to exit the EU while sticking to set 'red lines' *and* keeping as many benefits associated with membership as possible.

These analyses of Brexit, unsurprisingly given that they were undertaken before the announcement of new UK–EU terms, tended not to conceptualise how we might go about identifying policy implications. Here, in the absence of any theory of EU-exit, we develop a conceptual framework for identifying policy changes resulting from Brexit. We do so, in the second section, by combining insights from (de-)Europeanisation, Brexit policy studies, and political economy of Brexit literatures. Our framework allows us to organise UK policy prior to exit into five, inter-related dimensions, thereby forming a detailed picture of policy under conditions of Europeanisation. We also identify three broader political themes that assist us in further structuring our analysis. To be clear, although we appeal in part to (de-)Europeanisation studies to organise our analysis, we are interested in understanding policy implications broadly writ, not just whether UK sustainable energy policy becomes more or less EU-like.

We apply our framework to UK sustainable energy policy in the third section. We identify which aspects of policy were most likely to change on exit, based on those that had been most Europeanised. This allows us to establish a pre-exit, Europeanised, policy starting position against which to assess change, and to point out important sustainable energy policy functions that were provided by EU membership. We then refer to the terms of UK–EU agreements, and related domestic policy decisions, to compare the Europeanised position with sustainable energy policy at the time of writing, March 2022. This method allows us to make some sense of Brexit as it unfolds in practice. We have tried to be as specific to Brexit implications as possible, while bearing in mind the broader context of COVID-19.

It is important, at this stage, to define what we mean by UK sustainable energy policy, partly because referring to it as a policy area might be confusing for readers who are more used to reading research on energy *or* climate change. We see it as a new policy area that sits at the nexus between traditional energy and climate change mitigation policy, but which does not include all aspects of energy or climate policy. Our definition encompasses energy policy that contributes, however directly or indirectly, towards meeting the UK's legally binding, Climate Change Act and Net Zero 2050 decarbonisation goals while *also* contributing towards affordability and/or security of supply energy policy goals (Kuzemko et al, 2016). This tricky political balancing act between objectives is so important now given that the UK is *not* on track to meet legally binding decarbonisation targets (BEIS, 2020; CCC, 2020a), at a time when households face rapidly increasing energy prices and while energy poverty remains such a critical issue (BEIS, 2021b). It has also been brought

into sharp relief by new UK, and EU, commitments to bring imports of Russian oil and gas to a halt.

Neither energy nor climate policy were targeted by Brexiteers as significant reasons for exit. This is partly because the UK and EU have tended to be in agreement on climate ambition and have had similar, market liberal orientations in energy. Brexit aside, the geographic proximity of the UK and EU means that coordination in energy trade, in how decarbonisation is achieved, and in energy security had become embedded in institutions and infrastructures over time. This proximate and interconnected energy relationship makes the question of how to leave, while maintaining as much cooperation in sustainable energy as possible, yet more pertinent. Within this context, we more rigorously question how Brexit is affecting UK policy.

This article makes a series of contributions to different literatures. It is the first, that we are aware of, since the end of the transition period which means that we can point to actual rather than possible UK policy impacts. Second, we develop a conceptual framework for identifying UK policy implications, and in doing so add to debates about the applicability of (de-)Europeanisation to EU-exit (Armstrong, 2018; Burns et al, 2019). Third, we combine insights to form a richer picture of change from macro-scale political economy debates about Brexit (Rosamond, 2019; Gamble, 2018), with meso-scale policy insights from energy and climate studies (Lockwood et al, 2017; Farstad et al, 2018; Lockwood and Froggatt, 2019). Last, we focus analytical attention on the question of explaining *why* some policy areas differ in terms of Brexit implications and highlight how much political work has so far been required to construct and implement Brexit, and what this means for UK policy capacity.

Conceptualising Brexit and policy implications

A first step in identifying policy implications is to establish a starting position to assess changes against, an approach also taken by new institutionalist scholars measuring policy change between periods of time (Kuzemko, 2013). Studies of potential Brexit policy implications have tended to start their analysis by outlining EU policy influences within their chosen area (Farstad et al, 2018; Burns and Carter 2018; Lockwood and Froggatt, 2019; Hantrais et al, 2019). These analyses presuppose that some aspects of policy will have been more impacted by EU membership than others, and that those aspects would be more likely to change upon departure.

Europeanised UK policy

Burns et al (2019) follow a similar route, but explicitly engage insights from Europeanisation studies to identify areas of environmental policy most subject to change. Indeed, as suggested by Copeland (2016: 1126), the starting point for research on de-Europeanisation 'is to establish the initial extent of Europeanisation in a policy area'.

Europeanisation can be defined in a number of ways, but here we follow Buller and Gamble (2002) who conceptualise it as a process of change whereby EU membership has led to transformation in some aspects of national policy. Like the analyses outlined earlier, this definition overtly recognises that not all policy becomes Europeanised, while change occurs partly through the adoption of EU rules over time. Each case of Europeanisation is, importantly, contingent to member states who retain choices in relation to the EU, while such choices are often influenced by domestic politics

and responses to EU rules over time (Copeland, 2016). The UK, for example, has exemplified the relatively 'reluctant' EU member (Copeland, 2016; Armstrong, 2018; Gamble, 2018). We also follow an understanding of Europeanisation as inter-active and bi-directional (Burch et al, 2009: 22), meaning that member states actively seek to influence the very EU rules that then influence aspects of national policy.

Some scholars break Europeanised policy down according to typologies or dimensions. This can reveal variety and greater detail about EU influence in policy areas. Both Burns et al (2019) and Copeland (2016) separate out Europeanised policy to structure their analyses of 'de-Europeanisation' in the UK. Burns and colleagues apply Börzel and Risse's (2003) typology of the EU's impact upon a member state's policy, politics and polity; while Copeland separates Europeanised policy out into four, cognitive and non-cognitive, dimensions: programmatic, agenda, procedural and cognitive.

We take inspiration from these deconstructions of Europeanised policy as a method of identifying a starting point against which to assess change, and of structuring comparisons. However, we define our own dimensions. This is because Copeland's analysis was concerned with policy change while the UK was still a member of the EU, and not explicitly with exit from the EU. He also developed the dimensions in relation to one, single EU governance tool, the open method of coordination (OMC). We need our dimensions to be relevant to exit and beyond one governance tool. Burns et al's (2019) typology offers an extensive view of Europeanised environmental policy and politics in the UK, while we are keen to focus on sustainable energy policy, including detail both on wider influences but also individual policies.

Our five dimensions of Europeanised sustainable energy policy are: policy ideas; targets, standards and rules; policy regimes and instruments; policy capacity; and foreign policy (see Table 1). They bear some resemblance to the policy dimensions, such as goals, rules and governing bodies, and 'cognitive' dimensions, including ideas, that Burch et al (2009: 22) see as making up processes of Europeanisation. They also draw on approaches to measuring policy change that break policy down into: ideas, goals, instruments and physical institutions of governance (Kuzemko, 2013).

Table 1: Dimensions of Europeanised policy

Dimension	Definition
Policy ideas	The political ideas that shape EU policy, including choice of policy objectives and the various methods employed in pursuit of objectives.
Targets and standards	Specific EU targets and standards that influence the direction of policy, for example EU 2030 sustainable energy targets.
Policy regimes and instruments	Individual EU regimes, policies and instruments adopted by the UK, for example the EU Emission Trading Scheme or Internal Energy Market trading regimes.
Policy capacities	EU institutions that performed specific policy functions in the UK, like research and data gathering, policy implementation and oversight, and access to EU funds.
Foreign policy	International agreements, for example on trade, climate change or energy security, that the UK was party to through EU membership.

Our dimensions are further refined to better account for individual policy regimes, like the EU Emissions Trading Scheme (EU ETS), and specific targets and standards, such as EU renewable energy goals, which had become important aspects of UK sustainable energy policy (Farstad et al, 2018; Burns et al, 2019; Lockwood and Froggatt, 2019). Our decision to include 'policy capacity' as a dimension is based on insights from Brexit studies that EU membership had provided the UK with certain useful policy capacities (Lockwood et al, 2017; Burns et al, 2019). It also reflects arguments that the gap between UK policies and sustainability targets is exacerbated by a lack of policymaking capacity (Kuzemko, 2015; Sasse et al, 2020). Lastly, we add the dimension of 'foreign policy' to include this important aspect of Europeanised policy but also because, post-transition, the EU became external to the UK. Foreign relations have also been understood, in political economy analyses of Brexit, as a key area that may be reshaped by Brexit (Gamble, 2018).

Change: Brexit as de-Europeanisation?

Europeanisation concepts have done much to help construct a starting position, but to what extent can we turn to *de*-Europeanisation to frame what change on exit might look like? De-Europeanisation is understood as a process of dismantling Europeanised policy (Burns et al, 2019), while there is clear emphasis in Copeland (2016: 1126) on *intentionality* to reverse processes of Europeanisation. These interpretations relate well to notions of Brexit as a means through which the UK might distance itself from EU rules, or at least those to which it most objects (HM Government, 2022).

There is, however, little in the de-Europeanisation literature, for good reason, as the UK is the first member to leave the EU, that helps us to identify precise, exit-related policy change. To do so, we turn to observations, in political economy Brexit scholarship, that policy and politics will be re-shaped by the terms of UK–EU trade and cooperation negotiations (Rosamond, 2019; Gamble, 2018; Richardson and Rittberger, 2020). We draw from a detailed analysis of these agreements, not least the UK–EU Trade and Cooperation Agreement (TCA), to pinpoint relevant drivers for change in the third section.

We, like Armstrong (2018), would also caution against the narrowing down of EU-exit impacts to the rolling back of Europeanised policy, for a number of reasons. First, *intention* to move away from Europeanised policy is important to how de-Europeanisation is defined (Copeland, 2016), but we envisage some complications here. As inferred in our dimensions of policy approach, Europeanisation, and domestic political responses to it, differ within but also between policy areas. In areas like immigration, trade and law there has been clearly stated UK intent to take back control from the EU (HM Government, 2018), but relative to these areas energy and climate change were rarely mentioned as reasons to depart. This lower level of intention to diverge in less contested policy areas is important to consider as it implies a more complex range of Brexit policy impacts and offers one explanation of the varying dynamics of divergence between areas (Armstrong, 2018: 1101).

Second, political economy analyses focus our attention on the possibility of differences between initial intentions behind Brexit and the political practice of actually implementing it (Gamble, 2018). This causes us to think about Brexit as a process that has needed to be constructed over time by specific actors. For example, in addition to the substantial work of undertaking complex domestic and UK–EU renegotiations, it has included the need for political decisions on 'what to do about a huge raft of "domestic" public policy which emanated from the EU over the decades' (Richardson and Rittberger, 2020: 651).

Multiple civil service tasks are involved: analysis, coordination, negotiation, legislation and implementation – all requiring considerable political time and energy.

All of this has been undertaken, so far, within a context of reduced state capacity (Wincott, 2017). In 2016, when the UK voted for Brexit, Whitehall was the smallest that it had been since 1939 (IfG, 2021). Because new departments were needed to implement Brexit, civil service numbers then grew, but they remained well below 2009, pre-austerity levels (IfG, 2021). This raises the risk that concentrating significant civil service capacity on implementing Brexit might leave other policy areas less well staffed for as long as it takes to resolve. This is of particular significance to sustainable energy where significant amounts of political work are still required to meet legally binding targets (CCC, 2020a), and further underpins our decision to include policy capacity as a dimension of Europeanised policy.

Lastly, de-Europeanisation was designed to think about national policy changes in relation to the EU. Analysing EU-exit through the lenses of de-Europeanisation might, however, limit us to questions of the degree to which a policy area becomes less 'EU-like' on departure. This makes it hard not to fall into the trap of methodological Europeanism when analysing 'de-membership', thereby potentially downplaying other areas of influence over how UK policy might change (Armstrong, 2018: 104). While Armstrong (2018), in his analysis of Brexit and regulatory divergence, takes greater account of global influences, we also understand Brexit as potentially opening up UK policy to a relatively greater degree of domestic debate and influence over certain aspects of policy (Rosamond, 2019).

It is important, therefore, to consider that UK political preferences in relation to the EU are not fixed (Jensen and Snaith, 2016). Indeed, domestic political battles, and those with the EU, persisted throughout Brexit negotiations and certainly persist today. Interpretations of what Brexit should imply for any policy area may well continue to change as the implications of current sets of agreements become more apparent (deVille and Siles-Brügge, 2019). As such, in our analysis of implications in the third section, we also pick out emerging domestic debates in response to Brexit-related policy changes so far.

Taken together, Brexit implications are understood, in our approach, as being shaped in a variety of ways by: dimensions and degrees of EU influence on pre-exit UK policy; the terms of new agreements reached; whether there are clear intentions to diverge in that policy area; the capacity of UK policymakers to implement Brexit; and how UK policy adjusts to terms reached.

Comparing Europeanised and March 2022 policy

The following analysis is not intended as an exhaustive list of all changes ongoing in sustainable energy policy. As suggested by our framework, it compares the Europeanised position with policy in March 2022 broken down according to the five dimensions. The analysis focuses on aspects of UK policy that had been most affected by Europeanisation, while other areas of sustainable energy policy over which the UK had retained autonomy, such as choice of energy mix, do not form part of the analysis. Changes are summarised in Table 2.

We draw on climate change and energy policy studies of Brexit, as well as on primary and secondary UK policy documents, to identify the initial Europeanised policy position. To build a picture of what has changed we turn to the TCA (UK Parliament, 2020), and other key agreements, to identify new terms relevant to

Table 2: UK policy implications of EU-exit

Dimension	Implications
Policy ideas	*Low change, but greater UK discretion possible*: The UK approach to sustainable energy policy remains market liberal, with little evidence also of a move towards voluntarism. There is an emerging domestic debate about a greater role for the state in aspects of sustainable energy.
Targets, standards and rules	*Low change, but UK discretion evident in State Aid*: Strong commitment to climate change mitigation is maintained, while the UK remains committed to energy efficiency standards. The Subsidy Control Bill suggest divergence from EU State Aid rules.
Policies regimes and instruments	*Change: UK regimes relatively less effective and new UK policy costs*: UK ETS and new trading regimes similar in overall design, but both are relatively less efficient in relation to meeting sustainable energy goals. New regimes remain subject to re-negotiation – which extends policy uncertainty and requires further Brexit implementation work.
Policy capacity	*Change: Brexit places pressures on UK policymaking capacities*: Loss of implementation, oversight and research capacity versus Europeanised position. The UK has had to create new governing bodies inferring costs and replicating bureaucracy.
Foreign policy	*Change: UK an independent climate negotiator/less influential in the EU*: Loss of influence over European energy and climate policymaking and requirement to establish new representation in the EU. UK becomes independent party to UNFCCC and trade negotiator. Some trade deals highlight importance of sustainability, while others do not.

Europeanised sustainable energy policy. We also take account of intentions to diverge; capacity to undertake the work; and emerging UK political debate and responses to the new terms. For this we rely heavily on primary documentation, including from the Department for Business Energy and Industrial Strategy (BEIS) and the Climate Change Committee (CCC), as well as think tank and legal analyses of Brexit.

Analysing Brexit implications as it unfolds is tricky in terms of accessing information, not least as change is still ongoing, and so we also gathered evidence on what policymakers and other stakeholders consider to be the main implications so far. We hosted four roundtable events in January 2021, which were attended by members of BEIS, a range of business and policy stakeholders, and think tanks, to get first-hand insights into Brexit implications. The roundtables were operated under Chatham House rules, so information gleaned from them is not directly referenced but underpins the analysis. Towards the end of 2021 we also conducted eight follow-up interviews with key stakeholders involved in Brexit negotiations and sustainable energy policy to see if there were any updates, or if we had missed any key changes.

Policy ideas

Europeanised policy

The Europeanised sustainable energy policy position can be described as a compromise in ideas about policy, but with a market liberal leaning, and this reveals the extent to which Europeanisation was a bi-directional relationship between the UK and EU (Burch et al, 2009). For example, the liberalised, 'British' model of energy policy has repeatedly been referred to as serving as an inspiration for the liberalisation of EU energy policy from the 1990s onwards (McGowan, 2011; DuPont and Moore, 2019). This model is based on the idea that freely trading, competitive markets and cost-efficiency best deliver the long-standing goals of accessible and affordable energy

(Tews, 2015). In this way, Europeanised energy policy has also been shaped by 'least cost' policy rules and norms (Tews, 2015).

The UK has also been active in influencing some EU climate change policy choices. For example, the UK formed a significant part of the group that pushed for the EU to adopt the more market-oriented emissions trading scheme (ETS), in preference to the more rules-based, EU-wide carbon tax (McGowan, 2011: 203). The UK did have to compromise somewhat here, however, as it had had a clear preference for a voluntary ETS (McGowan, 2011).

EU ideational influences over UK sustainable energy policy are evident in the UK's adoption of the EU's more hierarchical, rules-based approaches to climate policy oversight and implementation. British administrative traditions tend to place relatively less emphasis on legal rules and codes (Burch et al, 2009: 21; Armstrong, 2018), hence the UK's preference in carbon pricing negotiations for a voluntary regime. Prior to the UK's exit there was speculation that it might use Brexit to pursue a more voluntarist position in environmental issues more broadly, with an emphasis on a less legalised approach to implementation (Burns and Carter, 2018; Burns et al, 2019).

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Although, in theory, leaving the EU infers possibilities for a different political approach, we do not see evidence of much official change so far in policy ideas, which is perhaps not surprising given the degree of UK input into EU thinking on energy and climate over time. Regarding specific concerns that the UK would adopt a more voluntarist approach, there was some mention of taking a less 'legalistic' approach in the draft UK Environment Bill (DEFRA, 2019), but we have not yet seen evidence of this in sustainable energy.

The UK's new 'Net Zero Strategy', announced in October 2021, re-confirms the government's market-oriented policy position, with little in the way of new public spending or state intervention (HM Government, 2021a). Indeed, the report commits the UK to unleashing 'the unique creating power of capitalism to drive innovation' (HM Government, 2021a: 8). Further commitment to market liberal ideas can be seen in the choice, see later in the article, of a UK ETS for putting a price on carbon rather than the carbon tax, which had also been discussed in the domestic debate about how to replace the EU ETS.

In terms of how domestic political debates are emerging there has been a recent backbench Conservative move to question the UK's net zero commitment, with the establishment of the Net Zero Scrutiny Group, but this has attracted only a handful of MPs. On the other hand, continued failure to meet carbon budgets and targets may yet provide ballast to other domestic voices that take a somewhat more state-oriented approach to sustainable energy. Indeed, Labour plans to spend £28bn per annum on climate change, at least four times the amount committed by the current government (Elgot, 2021), as well as a government-led mass retrofitting programme to improve energy efficiency (Taylor, 2021).

Interestingly it has also just been reported that the UK government, as it considers nuclear to be a sustainable form of energy and important to ridding the UK of Russian fossil fuel imports, intends to take a 20 per cent stake in the Sizewell C nuclear plant (BBC, 2022). Stated intentions on new subsidy regimes (discussed later in this article), also indicate some potential for increased state support for sustainable energy.

Targets, standards and rules

Europeanised policy

This dimension too shows a degree of bi-directionality but with greater degrees of EU influence this time. The UK has long been part of the group pushing for ambitious EU emissions reduction targets, while it has also been at the forefront of adopting ambitious, domestic targets and making them legally binding – the 2008 Climate Change Act (CCA) carbon budgets being a clear example.

The EU's historic influence over UK target setting is well documented. The EU 2020 Climate and Energy package served as a vital backdrop for the adoption, in 2008 under a Labour administration, of the Climate Change Act (Kuzemko, 2013; Geels et al, 2016). EU membership also led to the UK's adoption of a specific renewable energy target as part of the EU 2020 package, despite its longstanding preference for technology neutrality (McGowan, 2011; Kuzemko, 2013; DuPont and Moore, 2019; Interview 2). Others argue that EU rules have enabled Scotland and Wales to pursue more ambitious climate change policies than those adopted by Westminster (Burns et al, 2019; Moore and Jordan, 2021).

EU energy efficiency standards are another important aspect of Europeanised sustainable energy policy in the UK. This is because they are understood to have contributed significantly to reductions in UK emissions as well as to lowering household energy bills and, therefore, as simultaneously contributing towards meeting key affordability and decarbonisation policy goals (BEIS Committee, 2017: 47). Aside from EU standards, the UK had retained a good deal of scope to set domestic energy efficiency policy.

EU State Aid rules form another, albeit less prominent, aspect of Europeanised sustainable energy policy. They have been seen as restrictive to the extent that they have narrowed down the range of UK government support mechanisms for low carbon energy (Robins, 2019; Euractiv, 2021). For example, they have restricted both state support options for nuclear energy and local government use of their own renewable energy for internal consumption purposes (Kuzemko and Britton, 2020). One interviewee, however, commented that EU State Aid rules need not have been applied so restrictively (Interview 1).

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The TCA starts with a robust reaffirmation of the UK's, and EU's, commitment to 'the fight against climate change' by making it, and democratic principles, 'the essential elements of this and supplementing agreements' (UK Parliament, 2020: 6). This level of commitment has been reflected in various recent government decisions, such as the establishment of a new, Cabinet level, task force to put the UK on track to meeting emissions reduction targets (HM Government, 2020a), and in the commitment to decarbonising the electricity grid by 2035 (BEIS, 2021a). The TCA and subsequent decisions arguably, therefore, go some way towards assuaging concerns about the UK using Brexit to diverge from ambitious EU climate targets (Moore and Jordan, 2021).

Outside of the EU the UK will no longer have to commit to specific renewable targets, but offshore wind remains a key aspect of UK electricity decarbonisation policy. It is worth reiterating, however, that current concerns with UK sustainable energy policy stem not from lack of ambition or targets, but from a *lack of policies* to meet targets (CCC, 2021; Interviews 1, 3 and 6).

The TCA does not make much mention of energy efficiency, but EU standards have been transposed onto UK statute books through the European Union (Withdrawal) Act 2018 (HM Government, 2020b), and there is limited scope in the TCA for divergence (Froggatt et al, 2021). HM Government's recent *Benefits of Brexit* report mentions retained energy performance certificates that require change, a process which the government is seeking to simplify, but it does not mention whether it seeks to make those certificates more or less exacting in terms of efficiency (HM Government, 2022: 30). Beyond appliance standards, however, UK energy efficiency policy is largely viewed has having stalled (Rosenow and Thomas, 2020; Sasse et al, 2020; CCC, 2021).

Interestingly, there are growing indications of divergence from State Aid rules. On more than one occasion in the TCA 'legitimate public policy objectives' are stated as reasons to *not* meet various conditions relating to the level playing field and fair competition (UK Parliament, 2020). Reducing emissions clearly constitutes a legitimate public policy goal. The June 2021 Subsidy Control Bill, currently with the House of Lords, suggests a new UK system. It starts from the basis that subsidies are permitted if they follow UK-wide principles and 'enable key domestic priorities, such as … driving our green industrial revolution' (HM Government, 2021b). The press release explicitly claims that local authorities will be empowered to decide on whether to issue subsidies (HM Government, 2021b). These changes might also open a pathway, if Labour did come to power, for their greater state funding plans for sustainable energy.

Policy regimes and instruments

This is the dimension where Brexit implications so far are most evident. The UK had been a member of two important EU regimes, the EU ETS and the Internal Energy Market (IEM). However, in response to the UK's 'red lines' (HM Government, 2020b), and the EU's position on cherry picking, the UK lost membership of both regimes on exit.

Europeanised policy

The EU ETS as an established, highly liquid regime for putting a price on carbon is understood to have been of direct benefit to UK historic and future energy decarbonisation efforts (Froggatt et al, 2017; Lockwood et al, 2017; Deben, 2020; CCC, 2020b). Indeed, although the EU ETS has not maintained a sufficiently high carbon price over time, most witnesses to BEIS Brexit consultations argued that remaining part of, or at least linked to, the EU ETS would be their strong preference (BEIS Committee, 2017; HM Government, 2020c), and this was confirmed in a number of interviews (Interviews 1, 3, 4, 5 and 6).

In terms of energy trading, one of the most often cited benefits of IEM membership was downward pressure on electricity prices and, in turn, UK household energy costs (Vivid Economics, 2016; Lockwood et al, 2017; Interview 2). As such, within the context of the market liberal model, it is understood to have contributed, through trading efficiencies, towards decarbonisation 'at least cost' and meeting affordability policy goals (BEIS Committee, 2017).

IEM trading rules also, importantly, allow electricity units and transmission to be joined in what is referred to as 'implicit' trading. This form of trading has underpinned

the business case for new electricity interconnectors between the EU and the UK (Vivid Economics, 2016; Interviews 2 and 3). There are six electricity cables linking the UK to Europe, which are a key infrastructural element in establishing renewables-based electricity systems through increased opportunities for system balancing and flexibility (BEIS Committee, 2017; Froggatt et al, 2017; BEIS, 2020; Bocquillon, 2021). Because of the importance of interconnection, and in the context of plans for a considerable expansion of North Sea offshore wind, seven new interconnectors had been planned (Blondeel et al, 2022).

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Title XI of the TCA committed the UK to having in place an effective system of *carbon pricing* as of 1 January 2021 (UK Parliament, 2020: 202), and this left the UK with very little time to establish a new system. Brexit negotiations had opened up some domestic debate about preferred types of carbon pricing instruments (HM Government, 2020c), but in its choice of a standalone UK ETS the government ultimately stuck with the market-oriented design, which included similar sectors (BEIS, 2020). The UK ETS first traded in May 2021, and since then the price of carbon has been similar to that of the EU ETS (Ember, 2022), but it remains subject to change. It is referred to as the UK ETS, but it is notable that Northern Ireland remains inside the EU ETS for electricity meaning that there are now two carbon prices in the UK.

The main issue for many commentators is that the UK ETS is not linked to the EU scheme. Standalone, smaller emissions trading schemes are less liquid and more volatile (BEIS Committee, 2017; HM Government, 2020c; Goldberg and Bille, 2021; Interviews 1 and 2). For example, the EU ETS has one billion allowances in circulation, which can be sold to soften price spikes, while the UK ETS has 68 million in circulation (Nicholls, 2021). During September and October 2021, the UK carbon price spiked up by £20 per tonne of carbon, with cost implications for industrial and energy companies (Nicholls, 2021). The UK government have, indeed, committed to 'consult in due course' on another round of development to make the UK ETS 'net zero compliant', potentially by linking it to 'another' international ETS, and by extending it to cover more sectors (BEIS, 2020: 129). These improvements will not happen, however, until 2023 if possible, but no later than 2024 (Goldberg and Bille, 2021), with clear implications for the ability of affected stakeholders to plan medium-term.

The question of whether to link back to the EU also has implications for the EU's proposed Carbon Border Adjustment Mechanism (CBAM). Third countries who have an emission trading system linked to the EU's will be exempted (Interviews 7 and 8), while attempts to negotiate linkage to the EU ETS face an uphill struggle within the current context of broader, strained UK–EU relations (Interviews 1 and 2). Linking back to the EU ETS might not, however, be a necessary condition if the UK maintains an equivalent level of climate protection which, currently, seems likely.

In terms of *energy trading*, the UK has also now assumed third country status, while Northern Ireland remains part of the Single Irish Energy Market (SEM), thereby complicating energy relations. Since 1 January 2021 GB gas and electricity trade has fallen back on, again temporary but also less efficient, 'default' arrangements (Bocquillon, 2021; Lempriere, 2021). Default trading arrangements are sub-optimal in that trading is now 'explicit' and there are limits to the number of trading timeframes

(Bocquillon, 2021). Over the course of 2021 there was some divergence between UK and EU electricity prices and, at times, significant UK price volatility (Dixon, 2021; Grundy, 2021). Higher electricity prices are, in turn, largely passed on to consumers, at a time when energy affordability has become a key political issue once more.

Recognising the sub-optimal nature of default trading arrangements, Title VIII of the TCA included a commitment for both Parties to develop and implement another set of new arrangements by April 2022. The House of Lords Subcommittee for Energy and Environment had urged the government to improve electricity trading before April 2022 (Grundy, 2021), signalling some degree of policy debate emerging over Brexit and energy trade. The new terms have not yet been agreed. In a further twist, TCA agreement on new gas and electricity trading and interconnection principles has been tied to agreements on fishing, and is scheduled to run out on 30 June 2026, after which time it will be reviewed annually. This adds another layer of complexity to ongoing energy trading negotiations.

In terms of the new 'default' trading rules and their effects on new interconnectors, of the seven cables planned three have now been suspended (Blondeel et al, 2022), while Brexit decoupling has led to lower interconnector utilisation to Ireland (Lempriere, 2021). The recent fire at a UK–France sub-sea cable, and associated price spikes, underpin the importance of interconnection between markets, under conditions of greater renewables, to energy affordability (Sheppard et al, 2021). Regaining efficient interconnection rules, in particular moving back to an implicit trading relationship, is also seen as vital to the development of the joint EU–UK North Sea offshore wind projects which, in turn, form a significant part of how the EU and UK expect to meet electricity decarbonisation targets (Interviews 2, 8 and 9). Negotiations to improve trading rules continue but are also being disrupted by wider UK–EU relations (Interview 2).

Policy capacity

Europeanised policy

EU membership brought with it access to various policy capacities, including information and data, administrative and regulatory oversight functions (Burns et al, 2019; Moore and Jordan 2021). For example, membership gave the UK access to: the European Environment Agency's environmental data and analysis; EU governing bodies for oversight of international transmission and gas and electricity trading rules; and Euratom's governance and oversight of low carbon, nuclear energy (BEIS Committee, 2017; Froggatt et al, 2017; Moore and Jordan, 2021). This has meant that the UK did not have to maintain equivalent policy capacities at the national level, which saves costs while membership, importantly, also ensures a seat at the table in terms of negotiating new EU policies.

The EU also provided useful financial capacities in sustainable energy. EU financing, including from the European Investment Bank (EIB), accounted for around £2.5bn of the UK's energy-related infrastructure, climate mitigation and research and development (R&D) funding per year (BEIS, 2017: 39–40). Given the amount of investment needed for sustainable transformations, and austerity-inspired pressures on UK public spending, all available policy capacities are useful to meeting sustainable energy policy goals.

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On exiting the EU the UK lost access to most of the aforementioned EU institutions, while the TCA commits the UK to setting up a number of replacement bodies. Article VII committed the UK to 'play its part' in establishing a new, combined energy governing body, the Specialised Committee on Energy (SCE), to oversee energy transmission (UK Parliament, 2020: 164). As with the new Office for Environmental Protection, some have suggested that the SCE may have weaker oversight powers than the EU equivalent (Moore and Jordan, 2021). The UK has also had to create a domestic nuclear regime, expand the Office for Nuclear Regulation to oversee it and must also now maintain a direct relationship with the International Atomic Energy Agency (Etherington, 2020). Lastly, on access to funds, the UK lost access to EIB and EU structural funds. It has, in response to domestic pressures (Dunton, 2019), set up a new UK Infrastructure Bank, under HM Treasury, which was launched in June 2021. It intends to scale up activity and capacity incrementally (Infrastructure Bank, 2022).

The TCA overtly recognises that there are economic costs associated with establishing and maintaining this wide range of new policy bodies (UK Parliament, 2020: 785), although what these costs are is, as yet, unclear. So, on the one hand the UK saves on EU payments, but on the other has to foot the bill to replace EU capacities.

There have been, however, other opportunity costs of Brexit. The process of implementing, and arguably also constructing, Brexit has required considerable civil service capacity. For example, 532 BEIS civil servants were seconded to work on Brexit (Thimont Jack et al, 2020), which meant that their day job became Brexit, rather than attending to the highly complex task of devising urgent, new sustainable energy policy. This aspect of the Brexit process, its drain on sustainable energy policy capacities in government, was heavily emphasised by number of interviewees (Interviews 1, 2, 3, 4 and 5), while one interviewee noted that many civil servants ended up doing, essentially, two jobs (Interview 1). This continues for some civil servants as they remain engulfed in re-negotiations over trading and infrastructure rules (Interview 2).

There are numerous examples of delayed and disappointing policies throughout this time-period. It is, of course, highly likely that COVID-19 further exacerbated this situation, although, Spain managed, mid COVID-19, to publish net zero targets together with a full strategy (Farand, 2020). The Clean Growth Strategy was delayed by the Brexit referendum and 2017 general election, while the Energy White Paper, that should have accompanied the 2019 net zero commitment, was also delayed (Mason and Harvey, 2020; Marshall, 2020). Others argue that certain policies in this time period were rushed, and therefore insufficient to fill the policy gap (Rosenow and Thomas, 2020; Sasse et al, 2020; CCC, 2021). One example is the Green Homes energy efficiency scheme, announced only in 2020, but which by March 2021 was already being wound down (Sasse and Hodgkin, 2021).

Foreign policy

Europeanised policy

The EU represents all its member states in organisations important to climate change negotiations and establishing global norms. These include the UNFCCC Conference

of the Parties (COP), where member states also have individual representation, and the World Maritime Organisation and International Air Transport Association. The EU uses its considerable resources and negotiating capabilities to do so (Oberthür and Groen, 2018).

As a member of the EU, the UK was in a position to exert direct influence on EU energy and climate decision-making often, as seen earlier, with a good deal of success. On trade, however, Brexiteers felt that the UK could do better outside of established EU trading relationships.

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The UK is now represented at the UNFCCC independent of the EU (HM Government, 2022: 85). This coincided with the year that it assumed Presidency of COP-26, but it had to do so without reliance on EU resources, while UK climate policy also became more visible as a result, in the eyes of the global community (Menon, 2021). Indeed, in the run-up to COP-26, assessments were made of its claims to climate leadership based on whether UK policy is on track to meet decarbonisation targets (Harvey, 2021). Others have argued that the UK's raised profile on the world's climate stage influenced its ambitious pledge to reduce GHG emissions by 68 per cent by 2030 (Froggatt and Kuzemko, 2021). Reviews of the UK's abilities as host vary very widely, but most argue that 1.5° has been kept 'alive', even if it is on life support.

HM Government has claimed that having their own seat at negotiations will also enable the UK to use trade agreements to drive global climate action (HM Government, 2022: 85). The UK–Japan trade deal's sections on climate change does reflect the growing global importance of decarbonisation (Froggatt and Kuzemko, 2021), however the UK–Australia trade deal was secured by dropping the Paris Agreement 1.5° limit to global warming in a concession to Australia (Casalicchio, 2021).

As a third party to the EU, the UK needs to develop new capacities to influence, and coordinate with EU policymakers. The UK government, and energy companies, have invested yet further resources in setting up Brussels and other major EU city-based representations (Wright et al, 2020). This is highly necessary not least because of the speed at which the EU is making ambitious, new sustainable energy decisions, but also due to its geographic proximity, physical interconnections, and the ongoing energy trading renegotiations. The EU's recent liquefied natural gas (LNG) trading deal with the United States is a clear example of the UK being now separate to key international policy decisions in energy (Kuzemko et al, 2022). This is more evidence of the UK's need to invest in new governing bodies, but with less chance of EU influence.

Discussion and conclusions

We start our conclusion with some reflections on what we have not been able to see based on our approach to analysing Brexit implications for UK policy. We, in effect, drew certain boundaries around what areas of policy were analysed by defining the policy starting point, against which change can then be measured, in relation to dimensions of Europeanisation. This meant that we have been able to identify Brexit-related change, but not taken much account of other, non-Europeanised, aspects of UK sustainable energy policy over this time period.

In a similar vein, by focusing on UK implications, we have not been able to take much account of how EU policy is developing. The EU has, indeed, been busy. The new 'Fit for 55' strategy is its largest-ever legislative package, with a new 55 per cent emissions reduction target for 2030. It includes long-term policies, not least revisions to the EU ETS and the new just transitions and social climate funds (EC, 2022), which are important steps towards delivering on sustainable energy objectives. The EU has also announced a more detailed sustainable energy policy response to Russia's invasion of the Ukraine, including an EU-wide natural gas, LNG and hydrogen buying scheme, from which the UK is excluded (Kuzemko et al, 2022). Follow-up research could conduct a comparative analysis to see what UK policy might have looked like had it remained a member but, for now, it looks somewhat left behind.

The approach of separating policy out according to dimensions, and using this as a basis for structuring comparisons, did reveal important Brexit implications, particularly as we had attuned dimensions to sustainable energy as a policy area. First, it revealed that EU membership provided clear benefits in relation to meeting complex policy goals and that, partly as a result of this, the UK has needed to replace EU regimes, governing bodies and other policy capacities. We posed some questions about the financial costs of these new institutions, but further research is needed to fully identify the costs of this new architecture to compare them with EU membership payments (Thimont Jack and White, 2020). This aspect of Brexit contradicts Brexiteer claims of less bureaucratic burden and may contradict claims about the level of public funds that can be saved.

Second, new policies established thus far by the UK have maintained a like-minded approach, while the UK's overall ambitions in relation to climate change remain similar to the EU's. This might go some way towards assuaging concerns that Brexit might be used to lessen climate commitments (Farstad et al, 2018). Third, we have revealed that some new policy regimes may not be as effective as Europeanised policy in meeting UK goals, which means that huge political work has been undertaken for relatively less effective policy outcomes. This may be remedied in the years to come but, in the meantime, is a clear negative given that the UK is projected to miss legally binding emissions reduction targets and the urgency of mitigating for climate change. Our conceptual framing of Europeanised policy might well be transferable to other areas, albeit with alterations to dimensions to take account of the dynamics and details of any given policy area.

To address suggested conceptual shortcomings in de-Europeanisation when applied to EU-exit, we drew on insights from political economy to take account of some of the broader politics of Brexit. The UK has choices left to make as it renegotiates with the EU, tries to get back on track to meet legally binding targets, and regarding whether to opt for greater state intervention given changes in state aid rules. Up until now, the UK has only sparingly used potential for greater discretion to veer from the overall EU approach to sustainable energy. UK party politics may, however, play a role in the future, given Labour's alternative plans for public spending in energy. This suggests one route through which Brexit might enable greater domestic debate and policy contestation (Rosamond, 2019).

Brexit was defined in very general terms as an exercise in 'taking back control', and it follows that academic interest has been on de-Europeanisation as intention to diverge from EU policy (Copeland, 2016; Armstrong, 2018; Burns et al, 2019). But, importantly, that intention does not extend evenly across policy areas. By revealing

how useful EU membership has been in sustainable energy and how, in the dimension of policy ideas, Europeanisation had been a two-way process, our analysis explains *why* there might be less intention to diverge in certain areas (Armstrong, 2018). In turn, this helps us to understand why new UK policy regimes, like the UK ETS, are similar in design to the Europeanised version.

Lastly, this article contributes towards better understanding the *extent* of practical political work required to leave the EU, not least by thinking about it in relation to questions of UK political capacity. The suggestion that implementing Brexit would be complex (Gamble, 2018; Richardson and Rittberger, 2020), at a time when the UK's civil service had been substantially reduced, has been supported by our analysis. Indeed, this was a strong theme across interviews where frustrations with being taken away from the incredibly important 'day job' of ensuring sustainable energy were marked (Interviews 1, 2, 3, 4, 5 and 6). We would also observe, based on our analysis, that the quality of EU-departure is dependent upon domestic capacities to undertake that significant task.

To return to the question, outlined in the introduction, of Brexit as a balancing act between leaving and maintaining benefits we suggest that this has not been managed well in sustainable energy. Indeed, we argue not only that the UK has not achieved anything yet in sustainable energy that it could not do under EU membership, but that changes have by and large tended to be less-efficient mirrors of EU policies.

Interviews

Interview 1: UK sustainable energy policymaker
Interview 2: UK energy business representative
Interview 3: UK energy business representative
Interview 4: UK think tank analyst
Interview 5: UK energy business representative
Interview 6: Brexit analyst
Interview 7: EU policy advisor
Interview 8: EU think tank analyst

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Conflict of interest

The authors declare that there is no conflict of interest.

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