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Abstract: Amidst growing analytical interest in the spatial dimensions of sustainable energy transitions, relatively little attention has been given to the role of sub-national government, or the ways in which dominant socio-technical regimes for energy navigate diverse contexts. This paper addresses these two concerns by assessing the impacts of devolution within the UK on renewable energy development. It draws principally on policy networks analysis as the basis of a comparative assessment, examining how far the governments of Northern Ireland, Scotland and Wales have translated their formal powers in the energy sphere into renewable energy outcomes. Scotland's relative success in facilitating rapid expansion of on-shore wind is attributed to a more enduring and cohesive policy community around renewable energy growth than in Northern Ireland and Wales, but this success has been adversely affected by fragmenting policy networks around renewables at national (UK) level. The analysis highlights especially the role of planning and consenting, as mechanisms by which devolved governments have worked to contain the potentially disruptive effects of opposition to major infrastructure investments, thereby enhancing regime reproduction.

# Energy transitions, sub-national government and regime flexibility: how has devolution in the United Kingdom affected renewable energy development?

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Not for quotation without the authors' permission.

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Dear Professor Sovacool,

Thank you very much to you and your ERSS colleagues for organising the reviewing process so effectively. We are very pleased that we received four reviews within two months of submission, the advice of which offers many useful suggestions for improving the paper. We are also pleased that the reviewers are, on the whole, very positive about the paper and have borne this in mind in considering amendments. We have also borne in mind that the paper as originally submitted exceeded the recommended ERSS word limit, and so have sought to ensure that the total effect of our adjustments is to make no net addition to the word count. This slightly constrained what we could do but we have also looked for other places where the text could be streamlined. We have also submitted the revised text in track changes, as this is sometimes requested by journals. If you would prefer us to submit a clean copy, do let me know.

In the text that follows the reviewers' remarks are numbered and given first, followed by our account of how we have dealt with them in italics.

I do hope that the paper is improved sufficiently to meet your requirements. Do please let me know if you have any further queries.

Yours sincerely,

Richard Cowell

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### **Reviewer Responses**

1.1 Empirically the paper is based on 80 qualitative interviews (as set out in the introduction). However, very little interview data is drawn into the paper and the few quotes that are included have not been elected in any systematic manner (are they representative quotes?). Therefore, I would encourage the authors to include more qualitative data within the paper, and present this in a more analytical framework - there seems to be very rich data behind this paper, but we get very little insights from this. For example, it would be interesting to include more interviews from market actors on their perspectives on the various regimes, particularly any market actors that operate within the different parts of the UK.

*We have address this concern by (i) explaining in section 1.0 how we analysed interview texts and utilise quotes, (ii) have included more quotations and made sure that those used are useful, analytically (in sections 3.0, 4.0 and 5.0), and (iii) included some that refer explicitly to cross-jurisdiction comparisons (section 3.2). However, the paper is not primarily a work of discourse analysis and policy documents of various forms were also widely used.*

1.2 Although the UK case is interesting, many other countries operate within a multi-level framework, and it would be useful for the authors to recognise or include references of other spatial contexts within the opening section of the paper. While the themes covered in this paper contribute to the international literature, the opening arguments are not particularly well positioned vis-a-vis the experiences of other countries within sub-national actors.

*The opening section now makes an explicit reference to other countries with multi-level government and we have cross-referenced a couple of papers.*

1.3 I would also invite the authors to provide some additional speculation in the conclusion section. Specifically, how can the cases of Wales and NI transition to more effective policy-making communities? And also (although I recognise that this opens up a can of worms) what, if any, will be the impacts of Brexit on accelerating different path trajectories in terms of internal spatial politics and relations within the UK and also its relations with EU markets and targets set for renewables?

*We recognise the importance of Brexit but felt that its implications for energy were just too speculative in their own right without trying also to determine the implications of Brexit + devolution + energy. With the first point we have responded by making our original point clearer (especially in section 5.0), that there are difficulties in making recommendations about how particular jurisdictions might become more effective, as this raises questions about effectiveness in what sense, and in what context? We hope that this is at least now clear.*

2.1 I would recommend a final checking over (I noticed in passing a few typos or references not quite correct.

*Done.*

3.1 I took a little bit of time to consider the following points and suggest some minor changes around clarifying data use. You mention 80 interviews but yet we don't see that much of them. Please clarify that only a selection are used for this paper.

*This echoes reviewer comment 1.1; please see our response above. Interviews not quoted directly are still used to underpin the analysis and section 1.0 now says more about methodology generally.*

3.2 You also mention documents, could you give an indication of how you selected them? How many each year etc., or where they simply used as an additional flavouring rather than 'hard data'.

*We have resisted providing numbers of documents utilised but have indeed clarified their place in the analysis. It should now be clearer (from section 1.0) both the types of documents that we used, from which organisations, and that documentary texts were equally important to the analysis as the interviews and not just a source of additional colour.*

3.3 Rename discussion as 'results and discussion': The results sit primarily in the section called discussion, which could be more appropriately called results and discussion. There are some excellent examples here.

*Done.*

4.1 Two fields of theory are presented here - sociotechnical regimes (Geels et al) and policy networks (Rhodes+). But there is no discussion of how the two inter-relate. Is one to be embedded in the other? It seems so, but the 'how' is not developed explicitly. Whilst I wouldn't expect a full blown 'unified theory' here, it would be good to know the author's thinking on how the two fields connect.

*We have addressed this through some new remarks at the end of section 2.1 and clarifying the discussion at the start of section 2.2.*

4.2.1 As regards the Rhodes+ strand, it would be helpful to expand the discussion of the policy networks typology - too much reader knowledge is assumed here. What are the signs of a policy community v. those that indicate issue networks?

*We have addressed this in section 2.2 by expanding on our original account to make it more accessible to a wider range of readers.*

4.2.2 It would also be helpful to develop the theme of resource dependencies which is a core element of the Rhodes framework. Some comments are made, but the relevant aspects are presented in drip feed fashion as the article progresses. Filling out the discussion in these areas would be helpful for readers unfamiliar with Rhodes.

*We have addressed this across the paper but especially in section 3, to show how areas of formal competencies held by the devolved governments map onto the categories of resources.*

4.3 The question of resource distribution is raised in and around Table 1, but the links to network theory could be developed more fully. The discussion is a bit suggestive - the reader is being asked to draw the links - it would be good to make links explicit.

*As above, plus we have also modified Table 1 to show these links.*

4.4 Ahead of the quote below, it would be useful to have a research hypothesis. , The

authors say that the theory is to be tested, but what exactly is being tested, and how? E.g. what is the proposition and what is the methodology?

"The analysis proceeds by charting how the devolved governments in the UK have sought to affect renewable energy development, utilising and testing the explanatory power of policy networks analysis. It begins by considering how devolution created new actors and re-distributed formal powers within the energy sphere."

*We responded to this by deleting the clause 'utilising and testing the explanatory power of policy networks analysis', as it risks representing the analysis as hypothetico-deductive in form, when it is not. However, we have also clarified the text in various places to make it clearer which causal propositions are being examined and how policy network analysis assists. (And we do still reflect critically on its value).*

4.5 Turning to substantive elements - what is the main finding of the paper? Perhaps it is that Scotland has a genuine policy community, whereas NI and Wales have loose issue networks. The statement below goes in that direction; hence my extrapolation is based on it. However, it would be good if the authors made explicit claims in this area, and made the statements regarding key findings sharper and more salient. (This links with the earlier recommendation to say more on Rhodes network typology and why the differences between networks types do matter.)

"The value of a policy networks analysis perspective is reinforced when we turn to explain why renewable energy development in the other devolved government territories has proven slower than in Scotland. In short, our research found less evidence of sustained, coherent policy communities forming around renewable energy expansion"

*We have reworded the paper in section 4.1 and 4.2 especially to make the substantive findings of the paper clearer, and to be more explicit about the causal effects of different types of policy networks. We now say, explicitly, that differences between policy networks matter and why that is (including section 5.0).*

4.6 Presumably a key finding - and also a key assumption - of the article is the importance of subnational government, which comes through in repeated assertions of the article closing this research gap. However, if the networks in several devolved assemblies are weak, where does it leave the wider claim on the importance of subnational government for energy transition? Maybe what is required is more stress or acknowledgement that Scotland is a unique case?

*We acknowledge a lack of clarity here and have reworded the text to make our points clearer (in section 4.4 and 5.0 particularly) that it is analytically useful and revealing to give attention to the role of subnational governments in energy transition, but that does not mean that sub-national government is necessarily instrumentally important to particular transition outcomes. This links to our response to the next point. Other minor rewordings in the paper also try to frame the reader's expectations more carefully.*

4.7 In the same vein, I find the conclusion a little surprising. It seems to be saying that the sociotechnical regime is not really changing (but that is not the surprise). The surprise is that the conclusions seem to say that there is not much of an energy transition, whereas the body of the article seemed to be going in the other direction. I appreciate that nuances are required to qualify a complex picture, but there are some wrinkles here to iron out.

*By making changes to the text in section 1.0 and section 5.0 we hope we have clarified the point that simply expanding renewable energy capacity installed does not mean that a major transition is happening to the dominant socio-technical regimes for energy provision i.e. their main organisational, social and economic qualities.*

4.8 On a minor point, I suggest that the statement 'more omnipresent' be revisited, because the qualified noun is either omnipresent or not. Perhaps the authors mean 'more prevalent'?

*Noted, and done.*

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# Energy transitions, sub-national government and regime flexibility: how has devolution in the United Kingdom affected renewable energy development?

## Abstract

Amidst growing analytical interest in the spatial dimensions of sustainable energy transitions, relatively little attention has been given to the role of sub-national government, or the ways in which dominant socio-technical regimes for energy navigate diverse contexts. This paper addresses these two concerns by assessing the impacts of devolution within the UK on renewable energy development. It draws principally on policy networks analysis as the basis of a comparative assessment, examining how far the governments of Northern Ireland, Scotland and Wales have translated their formal powers in the energy sphere into renewable energy outcomes. Scotland's relative success in facilitating rapid expansion of on-shore wind is attributed to a more enduring and cohesive policy community around renewable energy growth than in Northern Ireland and Wales, but this success has been adversely affected by fragmenting policy networks around renewables at national (UK) level. The analysis highlights especially the role of planning and consenting, as mechanisms by which devolved governments have worked to contain the potentially disruptive effects of opposition to major infrastructure investments, thereby enhancing regime reproduction.

## Key Words

Renewable energy, devolution, policy networks, transition, United Kingdom



# 1 Introduction

Forging more sustainable patterns of development is an intrinsically spatial task, in that broader patterns of change are shaped by actions at multiple sites and scales (Cowell and Owens 1998). This is evidently true for the promotion of more sustainable forms of energy. Thus for example, the ability of the European Union to deliver on its targets of supplying 20% of energy from renewable sources by 2020 (2009/28/EC) and 27% by 2030 is shaped by the actions of member states and governments at other levels.

Since 2012, researchers have begun to engage more closely with the spatial dimensions of sustainability transitions (Hansen and Coenen 2015), including in the energy context (Bridge et al 2013). The 'methodological nationalism' of much transitions literature, in which the nation state was adopted, uncritically as the main analytical unit, has been challenged (Coenen et al 2012; Truffer and Coenen; 2012; Späth and Rohrer, 2013) with researchers exploring the interface between energy, transitions, space and scale (Hansen and Coenen 2015; Murphy 2015). Nevertheless, there remain deficits in our understanding. Firstly, while there is burgeoning research focused on some arenas of action such as the interface between energy and cities, others have pointed to the dearth of critical attention to sustainability transitions at regional and sub-national government levels (Bruyninckx et al 2012; Royles and MacEwen 2015), with few analysts tracing causal relations between energy outcomes and the complex panoply of actions undertaken by these governmental tiers (though see Smith 2007; Essletzbichler 2012; Hodson and Marvin 2013). Secondly, there is a need to consider whether actions in different places and arenas become constitutive of wider shifts in production or consumption (Hansen and Coenen 2015; see also Essletzbichler 2012); an agenda which requires more critical thinking about the spatial constitution of dominant regimes of energy provision – typically referred to as 'socio-technical regimes' – and the way in which these are organised across space, and become contextually embedded. These issues are connected, in that identifying how sub-national governments have engaged with energy – to refine, amplify, resist, or forge alternatives to wider, national norms – may illuminate how pathways towards more sustainable forms of energy provision might emerge, as well as how less sustainable forms persist.

In response to these concerns, this paper assesses the effects of devolution within the UK on the delivery of renewable electricity: wind, solar, biomass, hydro, wave and tidal power. It focuses primarily on the period from 1998, and compares renewable energy outcomes in Northern Ireland, Scotland and Wales, as well as England. The focus of the research is on renewable electricity generation, and emphasis is given to larger-scale facilities rather than micro-renewables, as this has been the dominant form of renewable energy investment in the UK through this period. The UK case is apposite for exploring the spatial dynamics of sustainability and energy transitions, in that 1998 saw the instigation of a major wave of political devolution that recast the spatial reach of 'national' energy policies promulgated by Westminster. While the UK situation has its own distinctive qualities (such as the persistence of relatively centralised government), the findings have relevance to other states with multi-level government structures like Germany (Schmid et al 2016) and Australia (Mey et al 2016), where sub-national government have a potentially important role in fostering energy transitions;

Patterns of renewable energy development unfolding across the UK have been spatially uneven, suggesting that explanations of such outcomes can offer wider insights into how governance arrangements influence the differential prospects of energy transition (Kuzemko et al 2016). Figure

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4 1 shows that for much of the first decade of the 21<sup>st</sup> century, Scotland could be considered a  
5 'leader' in renewable energy in the UK, built mainly on rapid expansion of onshore wind power from  
6 308MW installed in 2003 to 5216MW by 2013<sup>1</sup>. Renewable energy capacity in England only  
7 surpassed Scotland from 2011, relying more heavily on offshore wind, biomass co-firing in existing  
8 power plants and solar PV. Onshore wind has been the main technology deployed in Northern  
9 Ireland and Wales. When viewed in terms of capacity installed per capita of population or unit of  
10 GVA (Gross Value Added), then Scotland is again in the lead with all devolved territories display  
11 higher development rates than England (which has approximately 85% of the UK population;  
12 DECC 2013).  
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16 **[Insert Figure 1 near here]**

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18 Clearly then, the level of renewable energy developed in the territories of the devolved  
19 governments makes them critical to overall UK transition trajectories. However, given the complex  
20 arrangements of powers across the different tiers of government, one cannot infer that energy  
21 development *within* any particular sub-national government area can be attributed neatly and solely  
22 to action *by* that government. For causal explanations, one needs to consider the processes by  
23 which patterns of energy development are constructed and held together. Moreover, the expansion  
24 of renewable energy in quantitative terms does not tell us everything we may wish to know about  
25 transition. After all, renewable energy technologies can be deployed in diverse transition pathways,  
26 which may challenge prevailing social and economic arrangements or serve to reproduce dominant  
27 socio-technical regimes (Lawhon and Murphy 2011; Hodson and Marvin 2013).  
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31 To underpin our conception of agency, and provide a framework for four-way comparison, we  
32 utilise network-based explanations of policy formulation and implementation, especially policy  
33 network analysis (Marsh and Rhodes 1992). This helps address a thematic concern for our  
34 analysis, to relate the formal powers notionally held by subnational governments (*power in*  
35 *potentia*) to their propensity and capacity to use them (*power in actu*, after Latour 1986).  
36 Recognition of the constructed nature of governance spatialities is provided by supportive insights  
37 from relational perspectives on space and scale.  
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40 The methodology for identifying policy networks and tracing causal effects draws on qualitative  
41 research, using two data sources, documents and semi-structured interviews. The documents  
42 analysed embrace government policy statements for energy and energy aspects of planning from  
43 across the four government territories, including correspondence between ministers as well as  
44 party manifestos, from the period 1998-2014. 80 interviews were conducted, with senior figures in  
45 government (at all scales, politicians and officers), energy companies and trade associations, but  
46 also non-governmental organisations and local planning authorities, between 2011 and 2013.<sup>2</sup> All  
47 the textual data was subjected to thematic coding (after Flick 2002). In the analysis below, we  
48 present the causal effects and actor relationships revealed by the coding exercise, such that the  
49 quotations provided are both constitutive and illustrative of the arguments being made (Mason  
50 2002).  
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54 <sup>1</sup> DUKES 2015 Regional spreadsheet 2003-2014 installed capacity MW, September 2015, accessed 27<sup>th</sup>  
55 May 2016.

56 <sup>2</sup> To preserve interviewee anonymity, we use a code system to identify specific interviews. 'Scot' means interviewee  
57 was based in Scotland, 'NI', Northern Ireland, 'Wales', Wales and 'Eng' in England or UK level. 'Gov' indicates that the  
58 interviewee works for the government (officer or politicians), 'Adv' = advisor, 'LPA' = local planning authority; 'NGO' =  
59 non-governmental environmental group; 'Com' = company, 'Tra' = trade association; 'Aca' = Academic. The number at  
60 the end differentiates interviewees within the same category of respondent.  
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4 In sum, the aim of this paper is to explain the effects of devolved governments within the UK on  
5 renewable energy development. An important dimension of this is to evaluate why Scotland has  
6 been relatively successful, and reflect on the wider significance of this. In so doing, it responds to  
7 calls by Hansen and Coenen (2015) for greater use of comparative analysis to understand better  
8 the causal factors driving sustainability transitions, including the need to understand how  
9 'embedded norms and power affect policy choices, rules, regulations and outcomes' (Kuzemko et  
10 al 2016, p 98), and to throw light on the types of political and institutional conditions that make a  
11 shift to renewables more likely. The analysis also avoids an unthinking elision of 'transition' with  
12 'technological innovation', to consider the role of subnational government in infrastructure  
13 implementation, which is an under-examined dimension of regime persistence or change. The  
14 theoretical position adopted is discussed in more detail in the next section, followed by an account  
15 of the intersections between devolution in the UK and energy governance. The way that the  
16 devolved governments have utilised two key policy instruments – financial support for renewable  
17 and land use planning - is then outlined and the development impacts assessed. Following this,  
18 policy networks analysis is used to explain the policy formulation and energy governance  
19 approaches of the devolved governments. The paper concludes by summarising key findings.  
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## 26 **2 Understanding energy transitions**

### 27 *2.1 Spatial dimensions in the multi-level perspective*

28 We take as our start point the 'multi-level perspective' (MLP) (Geels 2002) on socio-technical  
29 transitions, though there is little need to elaborate its precepts here. A central concept is that of  
30 'socio-technical regimes' which – as in the case of energy – characterise particular systems of  
31 provision and are embedded in economic processes, consumption practices, regulatory  
32 arrangements and infrastructure. These regimes are seen as 'dynamically stable' (Geels 2011),  
33 sustaining and sustained by incumbent actors. Change may be triggered by 'niche' innovations,  
34 where they can coalesce and challenge the socio-technical regime. Opportunities for such  
35 challenges can arise from exogenous shifts in society, economy or politics – termed the  
36 'landscape' level – to the extent that they destabilise the existing regime, precipitating a range of  
37 potential transition pathways (Geels et al 2016).  
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42 Analysts have started considering how the MLP might be 'spatialized', especially in terms of the  
43 multi-scalar nature of transition processes and their contextually embedded nature. A number of  
44 debates are pertinent to our analysis here. The first is the frequently-made warning that the 'levels'  
45 in the multi-level perspective ought not be conflated with specific, territorial scales arranged  
46 hierarchically, but by degrees of stability (Geels 2011). Thus 'niches' - notionally relatively  
47 'protective spaces' in which there is more scope for novelties to emerge - have been recognised as  
48 composed of multiple elements, some locally embedded but others, like financing, arising from  
49 actions in other arenas such as national government (see Raven et al 2012). Less frequently  
50 examined – but highly pertinent to a consideration of the role of sub-national government – is the  
51 spatial constitution and reach of the socio-technical regimes. Truffer and Coenen (2012) have  
52 proposed that such regimes should not be seen as (spatially) monolithic, or nationally bounded, but  
53 as cutting across and connecting different territories and scales that, as they are orchestrated  
54 across space, unevenly distribute opportunities for actions that may stabilise or destabilise them.  
55 These insightful observations have been under-exploited to date.  
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4 However, understanding the contextual embeddedness of socio-technical regimes in regions and  
5 places (Lawhon and Murphy 2011) would benefit from questioning the tacit inference in some  
6 transitions thinking that regimes are inherently less exposed to the diverse exigencies of context  
7 than niches. Research from science and technology studies and techno-politics (Barry 2001),  
8 proposes that the elements that constitute regimes (markets, infrastructure, regulatory rules) are  
9 always a potentially fragile abstraction from the multiplicity of elements, forms and processes  
10 beyond the system, which they interact with, and with which they are in 'contingent, uneasy and  
11 unstable interrelationships' (Ong and Collier 2005, 12). Careful attention is required to how  
12 contextual conditions impinge on them if they are to be reproduced. Indeed, aspects of regime  
13 reproduction and development may also require 'protective spaces' that insulate them from  
14 disruption or political critique. Furthermore, it may be problematic to treat socio-technical regimes  
15 as if homogeneous configuration across space was always a defining quality (Hansen and Coenen  
16 2015). For regimes to be durable across space and time, it may be desirable that key elements are  
17 open to contextual adaptation so that they work in diverse settings (after Laet 2000). Spatial  
18 flexibility may therefore serve persistence as well as transformation.  
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23 This leads us to a second set of debates, concerning the emphasis within much transition thinking  
24 on technological innovation as the main driver of change (Hansen and Coenen 2015; Geels  
25 2011). The spatial dynamics of implementation – the rolling out of technologies, at scale, both those  
26 that are newer and those that are more mature - has been less well considered despite being  
27 equally critical to transition dynamics (Cowell 2016). Understanding adoption and implementation  
28 requires transitions analysts to give greater attention to infrastructure siting and planning  
29 processes, which brings into view the wider social and political conditions in which technologies  
30 and infrastructures are deployed: issues captured by Wüsthagen et al (2007) as dimensions of  
31 'social acceptability'. Infrastructure planning and consenting, by dint of their potential openness to  
32 heterogeneous and competing interests (concerned publics, impacted environments) are key  
33 spheres in which contextual embeddedness has to be negotiated.  
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37 These perspectives provide ways of interpreting the potential effects of sub-national government  
38 on energy transition pathways. Greater contextual attunement has long been held as a virtue of  
39 more localised action. Indeed, the positive normative claims that are widely made for local action  
40 on sustainability, that it facilitates better links with actors, and leads to policies better adapted to  
41 local conditions, have also been made in arguments for political devolution and have relevance to  
42 energy issues. Sub-national governments may indeed facilitate innovative technological or social  
43 practices that are responsive to local contexts and constituencies. However, they may also act to  
44 facilitate the reproduction of dominant socio-technical regimes as much as radical alternatives. .  
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## 50 2.2 *Actors and networks*

51 From this discussion one can see how government at any level may pursue a diversity of actions  
52 and agendas in shaping energy pathways. However to conceptualise agency and the links to  
53 outcomes one needs to move beyond the multi-level perspective (MLP) on transitions. As Geels  
54 (2011) suggests, the MLP is a middle range theory that can benefit from the insights of 'auxiliary  
55 theories' drawn from other perspectives.  
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59 There is an overlapping consensus that to understand transitions it is important to understand  
60 networks of actors – their composition, configuration (sectoral and spatial), strategies and  
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4 interactions (e.g. Verbong and Loorbach 2010; Kern et al 2014). In many cases, researchers are  
5 less specific on how precisely networks of actors should be analysed, and with what causal  
6 theories in mind. The requirement for a clear theoretical framework increases where comparative  
7 research is to be conducted. Moreover, any such framework should look beyond those sets of  
8 actors working to 'create' new artefacts or pathways (Lawhon and Murphy 2011), and be sensitive  
9 to the likelihood that the governance of energy is the subject of struggle, entailing competing  
10 conceptions of sustainability and alternative pathways. Relations between actors may be conflictual  
11 as well as consensual (Szarka 2007; Geels et al 2016), and how conflicts are managed may have  
12 a significant bearing upon outcomes.  
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16 The theoretical framework adopted here is 'policy networks analysis', representing the  
17 constellations of regime actors that encourage or resist energy transition at any particular scale. In  
18 the Marsh-Rhodes formulation (Marsh and Rhodes 1992), policy networks analysis identifies  
19 'policy communities' where a relatively small, restricted number of key actors negotiate with  
20 government to decide policy in a particular specialist field. The actors share core policy goals,  
21 enjoying stable relationships based on high levels of interdependence, which encourages policy  
22 stability and continuity. This interdependence means that actors 'share' resources in order to  
23 devise and enact policies that are mutually beneficial. The category of 'interdependencies' that  
24 shape network form is often characterised in terms of resources that can be pooled and  
25 exchanged. Such resources, suggests Rhodes (1999) can be constitutional-legal, hierarchical  
26 (concerned with control and supervision), financial, political (e.g. legitimacy) and informational,  
27 though Rhodes did not set out to be exhaustive. These are resources that may be possessed by  
28 the interest groups and the government actors in the network. In general the biggest example of  
29 policy communities is how the government, in wishing to deliver its preferred policies, needs the  
30 cooperation of the dominant interests in that field which, in exchange, acquire a big influence over  
31 the shape of at least the details of that policy. Indeed, in modern complex societies no one actor  
32 can address issues single-handedly. Policy fields with networks characterised by policy  
33 communities are contrasted with fields shaped by 'issues networks', where a larger, more fluid set  
34 of actors, of limited interdependence, are concerned with an issue but contestation of core goals  
35 remains more omnipresent. Influence on policy is more dispersed and policy turbulence can be a  
36 result. In the context of issues networks, policies may fail to emerge, or may have to be imposed  
37 with little give and take (that is resource interdependency and exchange) between members.  
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41 Using this framework, one might expect actor network coherence to affect patterns of policy  
42 change and development, though the significance of this may vary whether one is concerned with  
43 opening up energy pathway choices or with implementation. On the latter, one might hypothesise  
44 that renewable energy expansion is likely to be most effective where a policy community can  
45 sustain consistent support over time, to underpin what are often large and long-term investments,  
46 and to struggle where issues networks prevail (see for example Lauber 2012).  
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49  
50 Policy network analysis offers potential but, like transition theories, needs interpretation in a  
51 manner sensitive to the spatial constitution of agency and governance. As Haughton et al (2010)  
52 suggest, shifting the scale of government structures can affect the constellation of actors that  
53 participate in policy and the policies that emerge. Moreover, a focus on *internal* network  
54 configurations between actors *within* a territory risks neglecting the ways in which agency is jointly  
55 produced by the interactions of actors centred upon a particular arena with others beyond their  
56 territorial space (Carter and Smith 2009). Transition researchers have followed economic  
57 geographers in advocating the adoption of strategic-relational perspectives on regional space  
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4 (Raven et al 2012; Murphy 2015). Such perspectives can alert us to the ways in which some  
5 institutions – notably those of the state, but also perhaps major businesses – can greatly affect the  
6 operation of those trying to construct effective policy communities at sub-national scale (MacLeod  
7 and Goodwin 1999), which in turn can influence the objectives, instruments, rules, practices and  
8 outcomes of energy transitions (Kuzemko et al 2016).  
9

10  
11 Political scientists have developed concepts that help to link actor configurations with the evolving,  
12 constructed nature of governance territoriality. One might expect to see devolved governments  
13 forming the focus of ‘territorial policy communities’ (Bomberg 1994), characterised by a relatively  
14 small number of actors, with close, informal linkages, working in an integrated fashion across  
15 different policy instruments. Arguably one should be interested in the extent to which policy  
16 communities become progressively territorialised; sometimes becoming more embedded over time  
17 in the space of sub-national government (Carter and Smith 2009), yet also needing to negotiate  
18 dependence on national state actions to achieve particular goals (Dawley et al 2015). Viewed in  
19 this way, understanding the power of sub-national governments to act is not merely a matter of  
20 identifying the formal powers at their disposal, but also of tracing whether other actors become  
21 aligned around them, or choose to prioritise sub-national policy arenas for achieving their  
22 objectives.  
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26 If policy network analysis provides a simple, formal structure for comparative causal analysis, there  
27 are also some deficiencies that ought to be recognised. ‘Resource interdependencies’ is a broad,  
28 open-ended set of entities and this breadth is both a weakness and a strength, on the one hand  
29 placing pressure on analysts’ judgement about the relative ‘size’ of particular interdependencies  
30 constituted by dissimilar resource elements, yet on the other offering heuristic value (Toke 2010)  
31 and giving the framework the flexibility to embrace a diverse set of factors. Recognition also needs  
32 to be given to how non-human elements can exert agency in shaping change. Thus for example,  
33 the availability of indigenous energy sources, or ‘materially obdurate infrastructures’ like grid  
34 systems (Hodson and Marvin 2013) can help reproduce the dominance and spatial reach of major  
35 incumbent actors (e.g. grid operators, market regulators). Potential development sites are also an  
36 important dimension of systems of energy provision, with material as well as affective and  
37 institutional dimensions.  
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41 The analysis proceeds by charting how the devolved governments in the UK have sought to affect  
42 renewable energy development, beginning by considering how devolution created new actors and  
43 re-distributed formal powers within the energy sphere.  
44

### 45 46 47 **3 UK devolution and the governance of the electricity sector**

#### 48 49 *3.1 New actors, legacies and distributions of power*

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51 The prime effect of devolution in the UK from 1998 has been to create a set of new political and  
52 government actors for the territories of Northern Ireland, Scotland and Wales. In each of the  
53 territories new assemblies and executives have been given the powers formerly exercised directly  
54 by central government ministers. In terms of policy network analysis, devolution brings with it a  
55 reallocation of resources between Westminster and the devolved governments - constitutional-  
56 legal, hierarchical, financial and political – but the reallocation is asymmetric and complex.  
57 Scotland received a Parliament with primary legislative and tax-varying powers, Northern Ireland  
58 received primary legislative responsibilities but no powers over tax while the Wales’ Assembly  
59 initially received only secondary legislative powers. Complexity arises from the fact that the  
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4 creation of new, sub-national government actors did not create a neat division of powers and  
5 responsibilities between Westminster and the devolved governments, with energy and electricity  
6 being a particularly grey 'grey area' (Keating 2005), as Table 1 summarises.  
7

8 **[Insert Table 1 near here]**  
9

10 Central government in Westminster remains a pivotal actor, retaining control of key constitutional-  
11 legal, hierarchical and financial resources in the energy sphere. The main centres of governing  
12 capability are still located in UK government departments - the Department of Energy and Climate  
13 Change <sup>3</sup>(DECC) - with financial support for renewable energy subject to the budgetary control of  
14 the Treasury (Toke 2010). Arms-length regulators also exercise significant authority in managing  
15 Great Britain-wide energy markets, as does the National Grid Company in its role as operator of  
16 the grid network across England, Scotland and Wales. Security of supply, markets and  
17 competitiveness thus remain central government concerns.  
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19  
20 Of the devolved governments, Northern Ireland possesses the widest suite of formal energy-  
21 related powers<sup>4</sup>, including powers to design and operate systems of market support. This reflects  
22 the fact that electricity networks in Northern Ireland have historically been functionally detached  
23 from the rest of the UK, exhibiting greater cross-border integration with the Republic of Ireland. In  
24 Scotland, key aspects of energy policy are 'executively devolved', including control over major  
25 energy consents and planning, and operational control over aspects of market support. The Welsh  
26 Government has the fewest energy-related powers, of which the most pertinent are in planning  
27 policy. All of the devolved governments received responsibility for discretionary economic  
28 development funding which can be spent, *inter alia*, on energy-related projects.  
29

30  
31 So, devolution has to some degree dispersed formal UK government capacities to steer the socio-  
32 technical regime for electricity beyond Westminster, but 'formal competencies are only an indicator  
33 of the potential power of an organization' (Coulson and Ferrario 2007, p.607). Policy network  
34 analysis alerts us to how far the devolved governments interact with other actors, and thus where  
35 and how power is actually exerted – issues we return to below. Before this, however, it is  
36 necessary to assess how the devolved governments have utilised the powers available to them to  
37 affect renewable energy development and the outcomes. The account focuses on market support  
38 for renewable energy and land use planning, both instruments being critical in shaping renewable  
39 energy deployment.  
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### 44 3.2 *Market support*

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46 In most countries, renewable energy technologies receive some form of financial support to enable  
47 them to compete with conventional power generation. In the UK, central government actors –  
48 DECC and the Treasury – have the prime role in designing market support systems: in policy  
49 network analysis terms, they possess the key financial and hierarchical resources. Furthermore,  
50 market supports systems have operated in a broadly consistent fashion across the nation. Thus,  
51 the switch from financial support issued through the Non-Fossil Fuel Obligation, which was rather  
52 unsuccessful (Mitchell 1996), to the Renewables Obligation (RO) in 2002 (2005 in Northern  
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57 <sup>3</sup> The central government department with responsibility for energy has changed names frequently since 1998. We  
58 refer to it as DECC throughout, for simplicity, even though this name and arrangement strictly only applied from 2008.  
59 DECC was abolished in 2016 and its functions passed to other departments.

60 <sup>4</sup> Apart from nuclear energy, of which it has none.  
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4 Ireland) stimulated an upturn in renewable energy investment observable in all parts of the UK (see  
5 Figure 1).<sup>5</sup> A key question then, is whether the devolved governments have been able to use their  
6 more limited powers to shape market support and, in turn, whether this has affected the delivery of  
7 renewable energy in their territories.  
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9  
10 The RO is essentially a quota/tradable certificate system of support which sets electricity suppliers  
11 an obligation to achieve increasing targets of renewable energy. 'Renewables Obligation  
12 Certificates' (ROCs) are issued to renewable generators in respect of the units of electricity they  
13 produce, which suppliers must then purchase or suffer financial penalties for every unit of energy  
14 they fail to supply towards their target. The RO was formally broken up into three separate  
15 mechanisms for England and Wales (Wales having no autonomy here), Scotland and Northern  
16 Ireland (see Table 1). However, the ROCs can be transferred between operators and thus between  
17 the different territories, so creating a single UK market. The costs of complying with the RO are  
18 paid ultimately by all UK citizens through their electricity bills.  
19  
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21 The devolved governments have used their powers to emphasise different technologies. In  
22 Northern Ireland the NIRO has a special banding for small-scale renewables (<500kW), including  
23 farm-scale anaerobic digestion. The Scottish Government led the UK in using its operational  
24 powers to set higher ROC levels for particular technologies, notably newer, emerging wave and  
25 tidal stream power, allocating them 5 and 3 ROCs/megawatt hour (MWh) respectively (Winskel  
26 2007). This differential support only operated from 2008 to 2011, until the UK government  
27 extended the higher bandings to England and Wales, but interviewees in Wales and Northern  
28 Ireland suggest that this 'first mover' action contributed to the greater growth of commercialisation  
29 and testing facilities for these technologies in Scotland, whereas elsewhere in the UK local  
30 companies were perceived as losing out.  
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34 However, although Scotland and Northern Ireland have altered the RO for emergent technologies,  
35 this power has not been very important to date in shaping the overall volumes of renewable energy  
36 installed in these territories. More significant is the fact that both benefit from being part of an  
37 integrated, UK-wide pool of market support. The rapid growth of established technologies,  
38 especially onshore wind in Scotland, has been supported by the way that the RO channels  
39 resources to projects from all UK electricity consumers. Northern Ireland elected to be part of the  
40 UK-wide RO system for financial reasons, despite having the constitutional legal resources to  
41 pursue its own support arrangements. If it operated its own financial support scheme in isolation,  
42 or in collaboration with the Republic of Ireland, the smaller pool of electricity consumers would  
43 mean less money available for projects in Northern Ireland.  
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47 The fact that the Scottish Government has been seen as delivering a rapid expansion of renewable  
48 energy has given it important hierarchical and political resources for negotiation in UK-centred  
49 networks with Westminster, especially given interdependencies created by the UK's requirement to  
50 deliver on EU renewable energy targets. We discuss this further below. However, this has not led  
51 to the devolved governments being able to influence the development of market support in any  
52 fundamental way. So, from 2010 deepening UK government concerns about the cost-effectiveness  
53 of the RO led to its replacement by a new system of support - Contracts for Difference (CfD)  
54 (DECC, 2011). The Scottish Government had good reason to object: CfD was designed, in part, to  
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58 <sup>5</sup>Feed-in Tariffs (FIT) are operated in a consistent way across England, Scotland and Wales, in a process managed by  
59 Ofgem, but do not operate in Northern Ireland. FITs only kicked in in 2010 and only fund projects up to 5MW installed  
60 capacity. For these reasons they have not received detailed consideration in this paper.  
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4 support new nuclear capacity to which the Scottish Government was opposed, and was also to be  
5 more firmly centralised in its operation, thus extinguishing the executive powers that Scotland  
6 enjoyed under the RO. Although the Scottish Government did raise objections<sup>6</sup> they were not  
7 sustained; a further recognition of the importance of the financial resource benefits arising from  
8 access to a UK-wide pool of resources if Scotland is to drive a major renewable energy expansion  
9 within their territory..  
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### 12 13 14 3.3 *Planning and consents onshore*

15 Renewable energy companies often decry planning as a key ‘barrier’ to development. Whatever  
16 the veracity of this claim (Cowell 2007), there is no doubt that planning processes shape the  
17 engagement of different actors, mediate the contextual factors admissible in making decisions, and  
18 thereby affect the availability of development sites. Moreover, land use planning and energy  
19 consenting are almost entirely devolved (see Table 1), giving much scope for autonomous policy  
20 development. Table 2 captures how planning arrangements for renewable energy have been  
21 adjusted since devolution, showing that a key axis of variation is the extent to which devolved  
22 governments have sought to determine consents centrally, and steer local government decision-  
23 making. In policy network analysis terms, planning embodies important hierarchical resources i.e.  
24 the authority to direct and supervise decision-making.  
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#### 28 **[Insert Tables 2 and Table 3 near here]**

29  
30 A distinctive quality of the planning system for renewable energy in Northern Ireland is that local  
31 authorities have not had major planning powers. Until April 2015, all planning applications for  
32 renewable energy in Northern Ireland were determined centrally by the Department of the  
33 Environment. Decisions were underpinned by policy guidance for renewable energy, but this  
34 adopted more flexible, criteria-based approaches to siting issues than seen elsewhere in the UK.  
35 Centralised consenting and flexible guidance help explain why Northern Ireland has exhibited the  
36 highest consent rate for renewable energy applications of any part of the UK (see Table 3), but one  
37 also needs to consider the limited significance of potentially disruptive actors, as discussed below.  
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40 In England and Wales, an enduring facet of the planning system that structures the distribution of  
41 hierarchical resources is that onshore energy projects over 50MW are determined by Westminster  
42 while those below are determined by local government. In both territories, however, planning  
43 arrangements altered significantly after 1998 as governments sought to respond to growing public  
44 opposition to onshore wind in particular. In order to underpin the delivery of renewable energy and  
45 navigate environmental concerns, the Welsh Government used its policy-making powers to  
46 introduce a national zoning framework to give a supportive policy context for large-scale on-shore  
47 wind energy development in seven demarcated areas of upland Wales (WAG 2005; Cowell 2007).  
48 This guidance was interpreted by the wind energy sector as stabilising the conditions for  
49 investment, with the zones attracting applications totalling over 2000MW in capacity – twice initial  
50 expectations. This level of interest exceeds anything achieved onshore in comparable regions of  
51 England (DECC 2013). However, the resulting spatial concentration of large-scale windfarm  
52 applications and attendant requirement for major new grid connections fomented vociferous public  
53 protest, leading to refusals of projects within the seven zones despite the notionally supportive  
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60 <sup>6</sup> Correspondence, Alex Salmond to Chris Huhne, 12<sup>th</sup> July 2011.  
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4 policy. As a result the installation of new wind capacity has been slower and patchier than  
5 anticipated.  
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7 Westminster planning policy for renewable energy in England can be characterised into two  
8 phases. From 1998 until 2010, successive Labour Governments sought to create a more  
9 supportive policy framework, with pro-development planning guidance issued to local planning  
10 authorities. Beyond a tepid interest in regional spatial zoning and sub-national targets, these  
11 governments largely ignored NGO pressure for more strategic spatial guidance. However, as part  
12 of wider moves to streamline and accelerate major infrastructure consenting, energy projects over  
13 50MW (including renewables) were subjected to new 'fast track' procedures. The 2010 election  
14 saw the creation of a coalition government, with a dominant Conservative Party contingent seeking  
15 to act on public disquiet about wind energy in particular, leading to successive steps to give local  
16 planning authorities more control over renewable energy applications (see Table 2). These steps  
17 made local configurations of actors more important in decision-making (DCLG 2012; Harvey and  
18 Walker 2013), which has been perceived by the industry as adversely affecting consent rates  
19 (indeed, see Table 3).  
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23 Interviewees were clear in perceiving that when it came to planning regimes for onshore wind, 'the  
24 process in Scotland is better' (ScotCom1; also ScotGov1, EngGov1) than England or Wales.  
25 Interestingly, however, devolution triggered only relatively incremental changes. The Scottish  
26 Government has continued to determine 'major' energy projects centrally (those over 50MW) but  
27 without the major streamlining reforms undertaken by Westminster. The significance of these  
28 arrangements is magnified by the fact that Scotland has more large sites for wind farms, thus many  
29 more projects weigh in over 50MW and are determined centrally. Of the 27 consented wind farms  
30 over 50MW in the UK in operation by the start of 2016, 20 are in Scotland.<sup>7</sup> With renewable energy  
31 proposals below 50MW, the Scottish Government has worked actively with local planning  
32 authorities (LPAs) to help them take a facilitative approach to development. Although successive  
33 policy guidance has encouraged LPAs to identify preferred areas for wind energy and areas where  
34 it would be less acceptable, the Scottish Government has intervened to challenge authorities that  
35 pursue policies it regards as too spatially restrictive<sup>8</sup>.  
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40 No government – national/UK or devolved - has found an effective way to expedite new high  
41 voltage grid capacity. Such schemes are usually conflictual and slow to come to fruition, a  
42 reflection of disruptive landscape and environmental effects of threading highly visible  
43 infrastructure through rural environments and the resulting opposition. The 220km Beaulieu-Denny  
44 line, designed to enhance the grid's capacity to export renewable energy from the Scottish  
45 Highlands, took nine years from application to the issuing of consent. However, if the devolved  
46 governments have not been able to manage or reduce public opposition to such schemes, the  
47 Scottish Government did at least convey security of outcome. Grid enhancement schemes were  
48 identified in its National Planning Frameworks as of 'national interest', to which Governmental  
49 support was attached, thus underpinning business confidence.  
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### 54 3.4 *The view offshore* 55 56 57

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58 <sup>7</sup> REUK database, accessed 26<sup>th</sup> April 2016.

59 <sup>8</sup> See also letters from Derek Mackay, Minister for Local Government and Planning of the Scottish Government, to  
60 Moray Council and Fife Council, 6<sup>th</sup> August 2013.  
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4 For the period up to 2009 the development of new renewable energy capacity in the UK was  
5 largely a story of the uneven development of on-shore wind. However, since then, offshore wind  
6 has become a bigger fraction of overall UK renewable energy capacity, reaching 5100MW by  
7 2015<sup>9</sup>. Moreover, examining the offshore realm casts a different light on the effects of devolved  
8 government.

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11 Given that the devolved governments have all expressed strong interest in expanding marine  
12 renewables, it is noteworthy that Kern et al's explanation (2014) of the rise of offshore wind does  
13 not identify them as significant actors. Our research concurs that key resources are held by the UK  
14 Government, which was central in increasing market support for offshore wind (to 2 ROCs/MWh),  
15 and the Crown Estate, a UK-wide public agency that has acted 'entrepreneurially' (Kern et al 2014,  
16 640) in organising the licensing of areas of sea to prospective energy developers. The emphasis  
17 on large-scale investments has also reinforced the role of major construction and energy  
18 companies, most of them multi-national. English regional development agencies are also seen as  
19 important (Dawley et al 2015). Does this mean that devolved governments have had little effect on  
20 outcomes in this sector?  
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22  
23 Devolved governments have been active in spheres where they have relevant powers, such as  
24 planning and consenting (see Table 3). The Scottish Government created a dedicated in-house  
25 agency, Marine Scotland, to provide a 'one stop shop' consenting/licensing agency for marine  
26 projects – exploiting its greater scope to pull together a more integrated set of arrangements than  
27 can readily be achieved for England or Wales. However, while some offshore wind farms have  
28 attracted public opposition (Ellis et al 2007; BBC News 2014), only rarely has this actually thwarted  
29 projects compared to onshore wind, with planning issues offshore being more concerned with  
30 mediating the interests of organisational actors in fishing, navigation and conservation (Kidd et al  
31 2012). In all parts of the UK consenting is centralised i.e. the role of local government is limited.  
32 These factors make differences in planning procedures between devolved governments less  
33 relevant to development outcomes.  
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37 The promotion of emergent wave and tidal stream technologies has been given great attention by  
38 the devolved governments. We noted above how Scotland had varied RO support to attain a  
39 competitive advantage for research and development, but the devolved governments have also  
40 used their discretionary economic development spending. Scotland successfully pulled in UK-  
41 government funded development facilities like the Catapult centre for Offshore Renewable Energy,  
42 showing its status within cross-UK strategies for industrial development. It has also provided the  
43 biggest share of funding for the European Marine Energy Centre, based in Orkney, and issued  
44 leases for several commercial sized schemes in its Pentland Firth marine renewable development  
45 zone (see also Dawley et al 2015). The devolved governments of Northern Ireland and Wales have  
46 also supported demonstration and utility-scale facilities around their coasts (e.g. the SeaGen  
47 project in Northern Ireland and DeltaStream in Wales). In addition, the Scottish and Northern  
48 Ireland governments have projected themselves as leading advocates for marine renewables, and  
49 been active in raising the profile of marine renewables within the European Union. They have  
50 been leading partners in EU-funded projects to promote marine energy grids that would better  
51 capture potential energy development (Scottish Government et al 2012).  
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54 What is questionable is whether actions by the devolved governments have markedly affected  
55 deployment to date. Patterns of offshore wind development reflect mainly the intersection of  
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60 <sup>9</sup> Digest of UK Energy Statistics 2016, Chapter 6  
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4 economics, shaped by national-level policy networks around market support centred on  
5 Westminster, and physical geography. Most turbines have been installed in the English North Sea  
6 and Liverpool Bay (bridging England and Wales), where the shallow seas reduce development  
7 costs, and criticism from publics and landscape groups has been limited in its effect (Cowell et al  
8 2012). Scottish and Northern Irish licensed areas tend to be in deeper water, which raises costs; a  
9 critical factor shaping project realisation as UK policy agendas came increasingly to emphasise  
10 cost reduction. Consequently, offshore wind energy development remains concentrated in the  
11 English North Sea; wave and tidal energy technologies remain at early stages of  
12 commercialisation, with progress highly vulnerable to UK-wide turbulence in funding (ENDS  
13 2015a).  
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#### 19 **4 Results and discussion – explaining policy choices and outcomes**

20 The analysis above assesses how policy choices by the devolved governments have affected  
21 renewable energy outcomes. How then, might these choices be explained? The patterns of  
22 renewable energy development are not a simplistic path-dependent extrapolation of pre-devolution  
23 trends. Scotland already had significant hydro capacity by 1998 but this has not been the  
24 technological basis of expansion since devolution. Wales had 150MW of on-shore wind installed by  
25 1998, then a major part of the UK total, ‘however after a good start things started to splutter’  
26 (WalesTRA1). Proximity between key actors is widely seen as helping to facilitate network  
27 formation (Hansen and Coenen 2015), so one might expect the smaller size of sub-national  
28 governments to facilitate solidaristic, territorial policy communities (Bomberg 1994). Our  
29 interviewees attested to the small size and much greater accessibility of policy-relevant actors in all  
30 three devolved governments, describing them as ‘a bit of a village’ (ScotNGO1), but the difference  
31 in renewable energy outcomes between them indicates that actor proximity should not be viewed in  
32 simplistic, spatial terms. Further application of policy network analysis can however, enhance our  
33 explanation of the events observed.  
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##### 40 *4.1 Policy networks and Scottish ‘success’?*

41 Policy network analysis seems to explain why it is in Scotland that conditions have been most  
42 conducive to the large-scale delivery of renewable energy, with many interviews identifying  
43 ‘Scotland as being the leader’ (NITRA1). This is attributed partly to the political resources deployed  
44 by the Scottish National Party and its leadership, which has long regarded energy development as  
45 central to the economic future of an independent Scotland (Hamilton 2002), and is seen as having  
46 ‘gone gung-ho for renewables’ since forming their first government in 2007 (ScotGov4).  
47 Importantly, however, the expansion of renewable energy has attracted support in Scotland across  
48 the main three political parties - SNP, Labour and the Liberal Democrats - from the first days of  
49 devolved government (SNP 1999; Scottish Government 2001). Thus, ‘in Scotland right from day  
50 one there was this impression that everything was going to be the future of renewables (which  
51 meant, in a nutshell, “come to Scotland”’ (WalesGOV4). This temporal continuity in political  
52 resources created the time for governing capacity to be developed, agendas to be refined and  
53 interdependencies between actors to emerge.  
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58 Integral to this is the existence within Scotland of a series of actors with relevant resources that  
59 could then be pulled into close alignment. This includes major energy businesses such as  
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4 ScottishPower<sup>10</sup> and Scottish and Southern Energy, long-standing national and regional  
5 development agencies (Scottish Enterprise and Highlands and Islands Enterprise); as well as a  
6 trade association for renewable energy (Scottish Renewables), formed in 1996 and autonomous  
7 from trade associations elsewhere in the UK. These actors are all supportive of the Scottish  
8 Government's expansionist aspirations for renewable energy, and possess financial and other  
9 resources for delivery. The territorial connections of these actors to Scotland are relatively strong,  
10 but they have also been cultivated actively by the Scottish Government, which brought them into  
11 the energy policy-making process, notably in the Energy Advisory Board (seen by some  
12 interviewees as a more important arena for discussion than the Scottish Parliament) and the Forum  
13 for Renewable Energy Development in Scotland. Underpinning this collaboration, 'it's about  
14 convergence of interest and capability and opportunity, to be frank' (ScotAdv1); a recognition of the  
15 powerful interdependencies between renewable energy targets, the financial resources of business  
16 actors and the hierarchical and political resources that the Scottish Government possessed.  
17 Scottish Governments have thus been able to mobilise a strong and relatively territorialized policy  
18 community.

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23 The policy community surrounding energy development in Scotland in turn helps legitimise and  
24 rationalise the Scottish Government's full and assertive use of the powers made available to it by  
25 the devolution settlement. As one former minister put it, 'we took energy on and worked with that  
26 almost as if it was an unspoken claim of right' (ScotGov4), while the industry feels that 'civil  
27 servants are empowered to get on and address barriers' (ScotCom2). This is very clear in the  
28 preparedness of Scottish Government officers and ministers to encourage local planning  
29 authorities to take a facilitative approach to projects.

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32 One can see how the interdependencies characteristic of policy communities (Marsh and Rhodes  
33 1992) have built up over time. Integral to this temporal dynamic is that Scottish Governments have  
34 not just set successively higher domestic renewable energy targets but *have met them*; a 'relational  
35 asset' (Murphy 2015, 84) reinforcing Scottish Government credibility with the industry players. The  
36 Scottish Government's reputation for helping deliver on UK-wide renewable energy targets also  
37 secured it sympathetic relations within Westminster-based networks. Thus interviewees in England  
38 recall 'I've heard DECC officials frequently say "we need the Scots" in order to deliver those  
39 targets' (EngCom1). In terms of outcomes, the Scottish Government had long argued for reforms to  
40 transmission charges which would enable Scottish renewable generators to pay lower rates for  
41 sending their power south to England. DECC ministers report 'that was one of the big issues that  
42 [the Scottish First Minister] was continually raising with me in my time as Secretary of State and I  
43 was continually reassuring him that I was completely onside' (ENGGOv8). In 2012, OFGEM  
44 announced proposals which partly met the Scottish Government's demands (Toke et al 2013).

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48 Analysts of sustainability transitions have been criticised for giving undue attention to elite  
49 alignment around technological change, neglecting how orchestrating cohesion can marginalise  
50 alternative voices (Lawhon and Murphy 2011; Späth and Rohracher 2012), yet marginalisation of  
51 critical voices may be central to explaining how certain development pathways persist and expand.  
52 Again, policy network analysis can be insightful. Scotland's renewable energy expansion has  
53 certainly encountered conflicts, especially over on-shore wind and major electricity grid  
54 reinforcements, with sections of the public and landscape NGOs among the major actors.  
55 However, such groups have found it harder to exercise influence in Scotland than in Wales or  
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60 <sup>10</sup> Sold to Iberdrola in 2006.  
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4 England, such that renewable energy expansion has scarcely been environmentally constrained.  
5 This is partly because larger swathes of Scotland's prospective windfarm sites lie outside nationally  
6 protected landscapes or symbolically important 'wild lands', diminishing the policy resources of  
7 actors arguing for their protection. NGOs concerned with more 'domesticated' rural landscapes are  
8 far smaller than their English equivalents, and there is a perception that the Scottish Government  
9 has deployed its hierarchical resources to discipline local authorities and statutory conservation  
10 bodies, which have been 'completely under the cosh' (ScotNGO3). Such factors have made it  
11 difficult to challenge a sustained, Scottish economic narrative around renewable energy expansion  
12 which enjoys consistent high-level support:  
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15 'There's these phrases about world leadership in renewable technology and "the Saudi  
16 Arabia of renewable energy", and so we keep hearing these phrases all the time and they  
17 have almost become unchallengeable' (ScotNGO1).  
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21 Indeed, alignment of government and industry actors has been facilitated by the policy framing of  
22 renewable energy. Successive Scottish Governments have positioned renewable energy  
23 expansion as central to Scotland's national economic and environmental future; with a sustained  
24 emphasis on green jobs, growth and international competitive advantage (see SNP 1999, 2003,  
25 2007, 2011). As cause and effect of this, party politicisation of renewable energy expansion has  
26 been negligible.  
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#### 31 4.2 Northern Ireland and Wales as counterfactual cases? 32

33 The form of policy network seems to matter to renewable energy outcomes, and this deduction is  
34 reinforced when we turn to explain why renewable energy development in the other devolved  
35 government territories has proven slower than in Scotland. In short, our research found less  
36 evidence of sustained, territorial policy communities forming around renewable energy expansion.  
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38 In Northern Ireland, renewable energy displays qualities of an issues network (Marsh and Rhodes  
39 1992), but limited cohesion *within* government is a more conspicuous element, reflecting the  
40 enduring sectarian nature of politics in this territory. As a result, the devolved Assembly only  
41 emerged fully from suspension in 2007. Moreover, the power-sharing arrangements that allocate  
42 ministerial postings to all the main parties leave responsibilities for renewable energy fragmented  
43 between a number of departments, characterised in their operation as 'we get on with our business  
44 and you get on with yours' (NIGOV2). Potential resource interdependencies go un-exploited. This  
45 makes it hard to find clear champions to drive the agenda, deploying political resources, or to forge  
46 policy communities around renewables expansion. Political manifestos have tended to frame  
47 renewable energy in terms of helping the rural economy, reflecting the importance of agriculture  
48 sector actors in Northern Ireland politics, for which banding the NIRO to support anaerobic  
49 digestion is one policy outcome. All this helps to explain why renewable energy has been slower to  
50 take-off in Northern Ireland compared to Scotland, despite a wider set of formal powers. Offsetting  
51 the effects of these fragmentary policy networks, however, has been the configuration of actors  
52 around planning. Political involvement in renewable energy projects has been low in Northern  
53 Ireland, as have levels of local opposition (Barry and Doran, 2009), allowing development interests  
54 to maintain the case for a liberal planning policies that maximise siting flexibility. Despite its late  
55 starting position, on-shore wind in Northern Ireland has seen very rapid expansion rates compared  
56 to other parts of the UK.  
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4 In Wales the Welsh Government's more limited financial and hierarchical powers, and the more  
5 limited territorial congruity between government and business interests than in Scotland,,  
6 problematises the creation of territorial policy communities. Few major energy businesses have  
7 headquarters in Wales, and the staffing capacity of UK-wide renewable energy trade associations  
8 in Wales was minimal (consisting of one officer until 2012). Within the structure of the Welsh  
9 Government, energy had spent periods until 2011 closely tied to climate change policy, creating a  
10 'disconnection from the core economic development thinking' (WalesNGO2), leading to industry  
11 perceptions that the sector itself was required to lead on delivery. Elite consensus has also been  
12 more difficult to maintain. The National Assembly Sustainable Energy Group, which aimed at being  
13 cross-party, failed to attract consistent ministerial buy-in and folded in 2010. The Welsh  
14 Government hoped to forge a stable, territorial policy community around wind energy expansion by  
15 engaging key actors from the industry, environment and local government sectors in the creation of  
16 new, spatial planning guidance (Stevenson 2009). Consensus did not materialise. Although  
17 industry actors came to back the strategy with investment, and it has been supported by major  
18 conservation bodies, local community groups and landscape NGOs like the Campaign for the  
19 Protection of Rural Wales were never fully supportive. As the impacts of major onshore wind and  
20 grid expansion became clearer, so opponents successfully politicised the issues, with pro-  
21 renewable energy politicians losing seats in local, general (UK) and Assembly elections to  
22 Conservative Party representatives with more oppositional stances. As a result, local planning  
23 authorities in mid-Wales have been difficult to bring into alignment with the Welsh Government  
24 policy.  
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#### 32 4.3 *Fragmenting policy communities in England*

33 Although policy networks around renewable energy in Westminster were always more diffuse  
34 because of the bigger size of the UK government, since 2010 it has been possible to observe a  
35 significant fragmentation of renewable energy policy communities and their evolution into a more  
36 conflictual issues network. Mounting local public opposition to on-shore wind (and field-scale  
37 solar), in parts of England attained greater national political salience with the election of the 2010  
38 Coalition Government, with the Conservative contingent more electorally sensitive to rural  
39 opposition and sceptical of key tenets of previous, Labour environmental agendas (ENDS 2011).  
40 Because Conservative Party ministers controlled the planning ministry, one policy outcome was the  
41 legitimising of more restrictive local planning approaches to on-shore wind (see Table 2), with  
42 actors that previously found it difficult to influence the pro-renewables regimes becoming more  
43 influential. As one countryside NGO officer said, 'we got rather more policy change than we  
44 expected'.<sup>11</sup>  
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50 However, whereas changes to planning apply only to England, pressure from Conservative Party  
51 MPs<sup>12</sup> also informed government actions with a wider spatial reach, such as moves swiftly to scale  
52 back market support for on-shore wind. The Coalition government also pressed for the EU to adopt  
53 decarbonisation targets rather than national renewable energy targets post-2020. Both moves were  
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57 <sup>11</sup> Pers comm.. 30<sup>th</sup> January 2013.

58 <sup>12</sup> The call by 100 MPs for reduced financial support for on-shore wind was mostly Conservative Party members, but  
59 did include two Liberal Democrats which, perhaps unsurprisingly, represented constituencies in rural Wales facing  
60 large-scale wind farm development and grid reinforcement.  
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4 designed *inter alia* to allow greater flexibility in energy pathway choice (ENDS 2015b), allowing  
5 nuclear power to play a major role.  
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8 This recalibration of policy objectives and technology choices marginalised renewable energy  
9 actors within Westminster policy networks, as the resources they possessed – be they hierarchical,  
10 financial or political - became less relevant to a government looking to other technological  
11 pathways. This included devolved governments like Scotland who, whatever interdependencies  
12 they may have developed with pro-renewable energy actors in DECC, are shown to be less  
13 influential in key Westminster policy networks shaping future UK energy development than the  
14 Treasury and ‘insider’ industrial and energy organisations pushing for energy market reform and  
15 nuclear expansion (Toke and Nielsen 2015). As one Northern Ireland energy company put it  
16 “Westminster doesn’t give a tootle about what happens in Belfast... they just ignore it as they have  
17 bigger fish to fry...” (NICom2). The spatial geometries of financial resources, with market support  
18 controlled by the Treasury in the UK government, are a clear illustration of strategic-relational  
19 perspectives on regional space (Raven et al 2012), insofar as they further highlight the external  
20 resource dependencies underpinning territorial policy networks.  
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#### 24 25 4.4 *Sub-national government, scale and sustainability transitions* 26

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28 Devolution in the UK and, with it, the reallocation of certain energy-related powers to the new sub-  
29 national governments has certainly impacted the evolution of renewable energy development, but  
30 the fact that the role of sub-national government has previously been rather under-recognised can  
31 be seen as reflective of blind spots in transition theory, stemming from the emphasis on  
32 technological innovation. While the devolved governments have all given support and ‘protection’  
33 to newer, innovative technologies, the main material effects of devolved government on renewable  
34 energy outcomes to date have been faster deployment of mature technologies, especially onshore  
35 wind. The ‘innovations’ – if this is the right word – that have most affected development outcomes  
36 are thus more in the fields of land use planning and consenting; measures that help to align  
37 investors with the availability of sites and contain the scope for local government or civil society to  
38 delay or de-rail project approvals.  
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42 A key illustration of this – as summarised in Table 2 - is the various ways that the devolved  
43 governments have exhibited greater centralisation of renewable energy project decision-making  
44 than in England/Westminster. Indeed, the contrasts have increased since 2015, with central  
45 government passing planning decisions for windfarms in England over 50MW to local planning  
46 authorities, while the Welsh Government has taken some consenting powers away from the local  
47 level. This was an outcome very much pushed for by the industry (Cowell 2016), and can be seen  
48 as a reflection of a more sustained lobbying presence in Wales since 2011; a belated response to  
49 evident interdependencies. Far from sub-national government being automatically more open to  
50 local civil society actors, outcomes in the energy sector show a propensity of territorial policy  
51 communities to depoliticise policy arenas and marginalise disruptive views (Bomberg 1994).  
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56 These findings show how the concept of a ‘protective space’ for development can be useful not just  
57 for thinking about niche developments but for understanding how the infrastructures of socio-  
58 technical regimes negotiate contextual conditions. As outlined above, maintaining the  
59 infrastructural and financial systems required to reproduce regimes is always *potentially* vulnerable  
60 to elements outside the system and requires a degree of protection such that stable conditions for  
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4 operation and investment can be maintained. The Scottish Government has done a more effective  
5 job than in England or Wales of constructing arrangements for renewable energy expansion,  
6 forming a coherent policy community and containing localised environmental challenges or  
7 politicisation that might bring these agendas into contingency, especially for on-shore wind. Many  
8 of the relevant actions have been in the sphere of planning, but the Scottish Government has also  
9 sought to use its more limited powers in respect of market support to foster investment stability e.g.  
10 using its executive powers over 'grandfathering' (the guaranteeing of subsidies into the future for  
11 recipient projects) to maintain support for sub-5MW solar projects (ENDS 2015, 13-14) and the  
12 early announcement of ROC levels. By such means the Scottish Government has offered  
13 supportive 'flanking conditions' (Szarka 2007), in terms of how regulations and procedures  
14 governing the operation of a policy are organised and carried out; and it has done so at a time  
15 when Westminster was gaining a reputation in the renewable energy sector for policy disruption.  
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20 Governments in England, Wales and Scotland have also sought to act on potential host  
21 communities for renewable energy infrastructure, by promoting greater levels of community benefit  
22 payments from renewable energy projects to local communities and encouraging community-  
23 owned energy schemes. The Scottish Government is the most advanced in this agenda (Strachan  
24 et al 2015), and has linked financial support to a specific target of obtaining 500MW of community-  
25 and locally-owned renewables by 2020. However, despite rhetoric of 'a community energy  
26 revolution' (Davey 2013), nowhere in the UK have community renewables become more than a  
27 supplemental strategy to dominant, large-scale commercial forms of electricity provision.  
28 Communitarian alternatives have not dislodged the dominant framing of renewable energy in the  
29 devolved governments, as a sector to be expanded at industrial scale, supplying energy above  
30 'domestic' demand, as the basis of export-related economic development. Policy networks analysis  
31 helps to explain this situation. Only to a minor extent has devolution created spaces in government  
32 for new voices pressing for a greater local control over (renewable) energy provision (Strachan et  
33 al 2015). Although community renewables actors evidently have links to devolved and UK  
34 governments, they tend not to populate the most significant policy networks (Bomberg and  
35 McEwen 2012).  
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## 43 **5.0 Conclusions**

44 Our analysis has shown how the actions of sub-national government can shape wider dynamics of  
45 energy transition. Within the UK, the devolved governments have not been passive recipients of  
46 renewable energy investment in their territories, but have sought to encourage its development  
47 using the powers available to them. This is clearest in Scotland, but both the Northern Ireland  
48 Executive and Welsh Government have also sought to steer development, adopting policy  
49 approaches that depart from Westminster norms. The analysis also offers useful wider insights into  
50 the spatial constitution of energy transitions. It shows how 'national' transitions are constituted by  
51 actions at other governmental levels. More fundamentally, our research shows how focusing on  
52 sub-national government can reveal wider causal processes in energy transitions, beyond the  
53 dynamics of technological innovation. With electricity generation in the UK, it has been the steering  
54 of deployment of existing technologies (notably on-shore wind) in which sub-national government  
55 has had greatest effect on renewable energy capacity to date, notably in the way that planning  
56 processes have been used to orchestrate the delivery of new generation facilities.  
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6 Policy network analysis has aided explanation of renewable energy outcomes and the renewable  
7 energy case shows how network form can matter. Scottish Governments have forged a sustained  
8 coherent policy community around renewable energy expansion, that is relatively territorially rooted  
9 in Scotland, and this helps explain why Scotland has seen a larger level of development than  
10 Northern Ireland (or England in some respects) despite having fewer formal powers at their  
11 disposal. Indeed, only for Scotland were interviewees clear that devolution per se had made a  
12 difference to renewable energy outcomes, based on its territorial alliance-forming potential:  
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15 'It's allowed us to have that debate here, and to have that focus and talk about sustainable  
16 economic development ... every community, every sector in Scotland can align and play that  
17 role, so I think that's been utterly fundamental' (ScotGov4).  
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21 The predominance of issues networks explains why Northern Ireland, England and Wales have, at  
22 various times (and for particular technologies) not matched Scotland's achievements. The policy  
23 community in Scotland generates power *in actu*, in that it galvanises and is galvanised by the use  
24 of the available governance powers in an assertive manner, bringing diverse actors into alignment.  
25 That devolved governments remain dependent on how the UK government organises market  
26 support is also readily apparent, such that Scotland's wind energy expansion 'may have been  
27 facilitated by the [Scottish] planning system but it's really been driven by the subsidy' (ScotNGO1).  
28 In Northern Ireland we saw how constitutional-legal resources (to pursue their own forms of market  
29 support) were traded against the greater financial resources attained by maintaining  
30 interdependencies with the UK. Yet national state policy developments are also amenable to  
31 explanation through policy networks, notably the minimal influence of devolved governments on  
32 debates about market support as policy communities around renewable energy expansion in  
33 Westminster fragmented into a more volatile issues network.  
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37 However, while the effects of sub-national governments and policy networks on energy transitions  
38 has been demonstrated, the results are not easily converted into straightforward instrumental  
39 recommendations for institutional design, as our comparative analysis revealed. Although absolute  
40 levels of renewable energy development are lower in Northern Ireland (perhaps because it is the  
41 smallest territory), it has still achieved rapid renewable energy expansion, especially of on-shore  
42 wind, and without such a coherent policy community. Relative absence of effective opposition,  
43 compared to other parts of the UK, has relevance here. This suggests that forging policy  
44 communities around energy development may matter more where there are potentially effective  
45 opposing actors (see also Cheon and Urpelainen 2013), and this in turn, may be particularly  
46 relevant to certain combinations of technological pathways and contexts. Seen in this light,  
47 Scotland has best displayed the kind of actor networks conducive to facilitating renewable energy  
48 expansion based on the bulk provision of controversial technologies like on-shore wind, where  
49 sustained elite cohesion around policy and implementation is important for investment. The rolling  
50 out of decentralised electricity systems based on micro-renewables, in which the navigation of land  
51 use planning constraints may be less critical than the coordination of diverse local actors, may  
52 depend on different policy networks with a different set of roles for sub-national governments.  
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57 This returns us to wider questions about the spatial constitution and embeddedness of socio-  
58 technical regimes and the qualitatively different energy transition pathways that could be pursued.  
59 Our results suggest that although devolution in the UK may be seen as fostering energy transition  
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in that it has enhanced the quantitative expansion of renewable energy capacity, sub-national government has still largely served to maintain dominant systems of energy provision based on large facilities supplying electricity into a centralised and organisationally unchanged grid. The UK case shows how sub-national action can facilitate the spatial adaptability and temporal persistence of dominant socio-technical regimes, especially in planning and consenting, where the three devolved governments pursued arrangements that created more facilitative 'protected spaces' for infrastructure expansion than was observable in England, which has benefited onshore wind particularly. One could conclude that devolution in the UK is an illustration of 'stabilizing landscape trends' (Geels 2011, 36) - i.e. a set of wider processes that helps to reproduce existing regimes, but does so by facilitating contextual adaptation. Perhaps one should not be surprised at this, given that devolution in the UK is itself part of ongoing statecraft designed very largely to manage tensions within this union state. It shows why analysts of energy transitions ought to give greater attention to the politics of state re-scaling (Hodson and Marvin 2013), and recognise how this may serve agendas, that maintain key elements of the status quo as well as offer opportunities for radical change.

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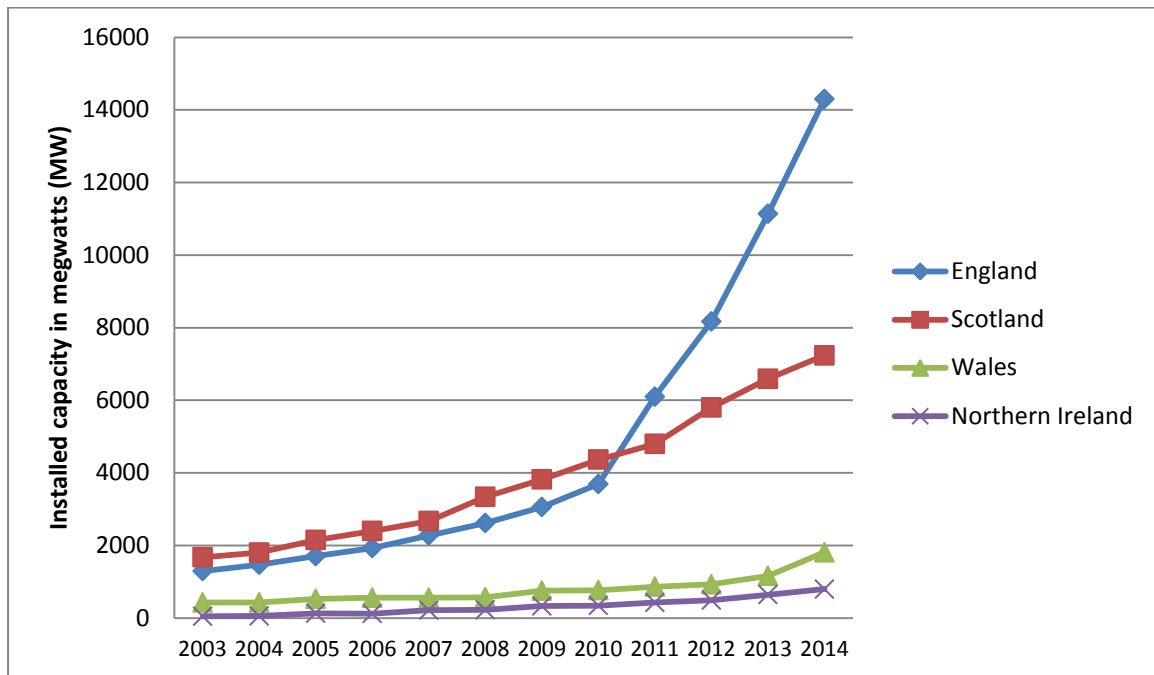
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Figure 1: Installed renewable energy capacity in the UK, 2003-2014



Sources: RESTATS historic regions data, UK Government regional energy statistics, <https://www.gov.uk/government/statistics/regional-renewable-statistics> accessed 27th May 2016

**Table 1: Devolution, government actors and energy-related powers (until 2015)**

<b>Instrument (and resources)</b>	<b>UK and England</b>	<b>Northern Ireland</b>	<b>Scotland</b>	<b>Wales</b>
<b>Devolved institutions (constitutional-legal resources)</b>	Limited decentralisation of roles to regional bodies, until 2011	Assembly and Executive; primary legislative powers; no powers over tax	Parliament and Government; primary legislative powers; tax-varying powers	National Assembly and Government; secondary legislative powers; spending only responsibilities [1]
<b>Energy policy (constitutional-legal resources)</b>	Full competence	Fully devolved	Executively devolved	Not formally devolved
<b>Market support for renewable energy (financial resources)</b>	Full competence	Fully devolved	Executive devolution of some support schemes	No powers
<b>Planning and consents (onshore) (hierarchical resources)</b>	Full policy competence for England, partial for Wales; full competence over major projects (50MW plus)	Fully devolved	Fully devolved	Partial powers over planning policy and consent for smaller schemes (below 50MW)
<b>Planning and consents (offshore) [2] (hierarchical resources)</b>	Full competence for English and Welsh Waters (subject to Welsh exceptions)	Fully devolved	Fully devolved	Power to determine applications up to 1MW (exception under Transport and Works Act 1992)
<b>Economic development spending (financial resources)</b>	Full competence; decentralised delivery by English regional bodies until 2011; some programmes are UK wide.	Fully devolved; can receive UK-wide programme funding	Fully devolved; can receive UK-wide programme funding	Fully devolved; can receive UK-wide programme funding

[1] Noting that the Government of Wales Act 2006 gave the National Assembly the power to initiate primary legislation, and the 2011 referendum enabled the Assembly to pass primary legislation in those areas devolved to it without the consent of Westminster.

[2] We do not include marine licensing powers and consenting for onshore connections for simplicity. The offshore regime applies mainly to applications in UK territorial waters (i.e. up to 12 nautical miles and designated Renewable Energy Zones).

**Table 2: Planning policy and renewable energy in the UK, post-devolution**

<b>Territory</b>	<b>Position at 1998</b>	<b>Significant Changes, 1998 to 2013</b>	<b>Changes, 2013 onwards</b>
<b>Northern Ireland</b>	All applications determined by central government (Department of the Environment). Above 10MW, consent also needed from Department of Enterprise, Trade and Investment.	Planning policy guidance introduced (Planning Policy Statement 18 [DoENI 2009]), with criteria-based approach to decisions, and supplementary best practice guidelines	From April 2015 most planning functions were transferred to local planning authorities, but central government (DoE) retains control over renewable energy consents.
<b>Scotland</b>	<p>Applications of 50MW or over and major grid network proposals determined centrally, by UK Government Ministers (Secretary of State for Scotland), managed by central Scottish consents unit, under Sections 36 and 37 of the Electricity Act 1989.</p> <p>Applications below 50MW determined by local planning authorities under town and country planning (Scotland) legislation.</p> <p>Planning policy guidance issued in 1994 gave criteria-based advice, and advised local authorities to demarcate in their local plans areas that would be suitable and unsuitable for wind farms (Scottish Office 1994).</p>	<p>Applications of 50MW or over and major grid network proposals determined by Scottish Ministers, managed by central Scottish consents unit (powers acquired under Scotland Act 1998 (Transfer of Functions to the Scottish Ministers etc) Order (SI1999/1750). Nine month time target for determining applications introduced, post-2007.</p> <p>Applications below 50MW determined by local planning authorities under town and country planning (Scotland) legislation.</p> <p>Planning policy guidance issued in 2006 revised and updated guidance, continuing advising local authorities to demarcate in their local plans areas that would be suitable and unsuitable for wind farms. Planning Advice Note 45 issues good practice guidance.</p> <p>National Planning Frameworks identify particular infrastructural schemes as 'national developments' for which there is government support.</p>	No significant changes.
<b>Wales</b>	<p>Applications of 50MW or over and major grid network proposals determined centrally, by UK Government Ministers, process managed by central government consents team, under Sections 36 and 37 of the Electricity Act 1989.</p> <p>Applications below 50MW determined by local planning authorities under town and country planning legislation for England and Wales.</p>	<p>Applications of 50MW or over and major grid network proposals determined centrally, by the Infrastructure Planning Commission (under Planning Act 2008), then transferred back to UK Government Ministers (Localism Act 2011), with consents issued under fast track procedures. Decisions guided by National Policy Statements.</p> <p>Applications below 50MW determined by local planning authorities under town and country planning legislation for England and Wales.</p>	<p>Applications over 50 up to 350MW to be determined by Welsh Government under Wales Bill 2016; applications over 350MW still determined centrally by UK government ministers under Localism Act 2011.</p> <p>Applications from 10-50MW to be determined by Welsh Government, under the Developments of National Significance (Wales) Regulations 2016.</p>

	<p>Planning policy guidance (PG22) provided criteria-based guidance (Department of Environment and Welsh Office 1993)</p>	<p>2005 planning guidance (Technical Advice Note 8) institutes spatial zoning for wind farms over 25MW, giving presumption in favour of development within seven 'Strategic Search Areas'.</p>	<p>Applications below 10MW determined by local planning authorities [under town and country planning legislation for England and Wales] and Planning [Wales] Act 2015.</p>
<b>England</b>	<p>Applications of 50MW or over and major grid network proposals determined centrally, by UK Government Ministers, process managed by central government consents team, under Sections 36 and 37 of the Electricity Act 1989.</p> <p>Applications below 50MW determined by local planning authorities under town and country planning legislation for England and Wales.</p> <p>Planning policy guidance (PG22) provided criteria-based guidance (Department of Environment and Welsh Office 1993)</p>	<p>Applications of 50MW or over and major grid network proposals determined centrally, by the Infrastructure Planning Commission (under Planning Act 2008), then transferred back to UK Government Ministers (Localism Act 2011), with consents issued under fast track procedures. Decisions guided by National Policy Statements.</p> <p>Applications below 50MW determined by local planning authorities under town and country planning legislation for England and Wales.</p> <p>Planning policy promoted criteria-based guidance (PPS22, ODPM 2004) and regional-scale mapping and target-setting (Power and Cowell 2012). Superseded by National Planning Policy Framework (2012) which endorsed local planning authorities instituting preferred areas for wind energy development in their local plans.</p>	<p>From 2015, on-shore wind over 50MW to be determined by local planning authorities (under the Onshore Wind Generating Stations (Exemption) (England and Wales) Order 2016 (11<sup>th</sup> March 2016) and Infrastructure Planning (Onshore Wind Generating Stations) Order 2016</p> <p>New guidance, June 2015, that local planning authorities should only grant permission for onshore wind farms where the site is in an area identified as suitable for wind energy development in a local or neighbourhood plan and, following consultation, it can be shown that impacts identified by local communities have been fully addressed and that the proposal has their backing (Ministerial Statement to LPAs, 2015). From 2016, applies to all windfarms, including those of 50MW and over.</p>

**Table 3** On-shore wind project consent rates, 2011-2014

	<i>England</i>	<i>Northern Ireland</i>	<i>Scotland</i>	<i>Wales</i>
2011-2012	58%	88%	70%	50%
2012-2013	59%	78%	76%	46%
2013-2014	31%	89%	62%	52%

Data taken from Wind Energy in the UK 2014, State of the Industry Report 2013, State of the Industry Report 2012, produced by Renewables UK. Data is for projects under 50MW.