Community renewables in the UK – a clash of cultures?

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Abstract: Community renewables policy and uptake are analysed and compared between Scotland, England and Wales, using a 'cultural frames' approach. Until very recently, the majority of UK community renewable capacity (in megawatt terms) was rolled out in Scotland. More egalitarian approaches to organising community renewables are observed in Scotland compared to more individualistic approaches in England and Wales. We argue that this may be associated with the existence of more 'communitarian' oriented local institutions in Scotland as opposed to England and Wales. However, the future trend of community renewables policy may be towards a more hierarchical modality in that governments are now stressing the advantages of partnering community renewable initiatives with commercial renewable energy schemes.

Keywords: community energy; political economy; cultural theory; social organisation; Scotland; England; Wales; institutional economics.

Reference to this paper should be made as follows: Harnmeijer, J., Toke, D. and Slee, B. (2018) 'Community renewables in the UK – a clash of cultures?', *Int. J. Technology Intelligence and Planning*, Vol. 12, No. 1, pp.99–120.

Biographical notes: Jelte Harnmeijer is an energy professional with about a decade of international experience in the practical delivery, research and policy aspects of distributed energy. He is particularly comfortable in the domains of microgeneration, energy access, shared ownership and local supply. He founded Scene Connect (http://scene.community) in 2011.

David Toke joined the University of Aberdeen in April 2013. He has had approximately 50 papers published in refereed journals in different disciplines, most of all in political science, but also including geography, energy and public policy. He has published four single-authored monograph books. He has recently published *China's Role in Reducing Carbon Emissions* in April 2017. This was published by Routledge, who have also given him a contract to a book entitled *Low Carbon Politics* which will be published in 2018. By the end of 2016, his output had been cited nearly 1,500 times according to Research Gate.

Bill Slee was the Head of the Socio-Economic Research Group (SERG) from the Macaulay Institute before his retirement which evolved into the Social, Economic and Geographical Sciences Group (SEGS) in the James Hutton Institute. He was previously a Professor of Rural Economy and the Director of the Countryside and Community Research Unit at the University of Gloucestershire. Most of his research has focused on interrelationships between the farming and forestry sectors and the other component parts of the rural economy and the exploration of the environmental externalities associated with rural land use. He has published widely across a range of scientific fields.

1 Introduction

Questions to do with politics and policy issues surrounding community renewables are important given emissions reduction and decarbonisation targets, as well as the other 'green' objectives of achieving greater decentralisation and local control over energy and environmental resources. Community renewable energy (RE) comprises a predominantly place-based collective enterprise where there is evidence for both actual participation (*process*) and collective benefits (*outcome*) (Walker and Devine-Wright, 2008b; Walker and Cass, 2007; Walker and Devine-Wright, 2008a).

Several studies have investigated the formation and nature of community RE projects (Bomberg and McEwen, 2012; Seyfang and Haxeltine, 2012; Toke, 2005, 2007; Walker and Cass, 2007; Walker and Devine-Wright, 2008a; Walker et al., 2010; Van der Horst, 2008; Warren and McFadyen, 2010; Murphy and Smith, 2013). Some comparative studies have been undertaken of differences of policy towards renewables among EU member states (Kitzing et al., 2012; Ragwitz et al., 2012) and between the UK and the US (Butler and Neuhoff, 2004). Most studies explore alternative forms of support for RE, and do not explicitly address different forms of institutional support for community renewables. Thus, little has been done by way of studying regional or international differences in legal and governance structures involved in community-based RE projects.

Scotland has many policy commonalities with other parts of the UK but, in the context of community renewables, there are also important differences in this partially

devolved policy arena. A major theme in the referendum on Scottish independence was the institutional differences between Scotland and the rest of the UK ('rUK' hereafter). This paper investigates differences between the different parts of the UK with respect to community renewable policy. It links this to a wider institutional context of public policies and relevant local and regional development institutions.

Two arenas of policy merit comparison: renewables policy and planning policy. The setting of renewables targets and design of support systems for community RE projects differs between regions and countries. Lehmann et al. (2012) report the importance of feed-in tariffs (FiT) in generating high community and farmer buy in to RE schemes in Germany and Denmark, but also point to public support for coal-based electricity production in some European countries as a deterrent to renewables development. Butler and Neuhoff (2004) report that planning obstacles were the principal barrier to developments of renewables in the UK in the 1990s, a view reinforced for a later period by Slee (2015).

Policy that impacts on community renewables is developed and implemented at multiple scales, from global agreements such as the Paris Accord, to European Union commitments on emissions reduction, to national renewables support policies, to the creation of regional support institutions, to local planning and regulatory arrangements. There are often interactions between scales. Particularly with respect to community renewables policy, it is desirable to explore other public policies that support community-based action.

The number of community renewable projects has been growing. In 2013, 57% of UK-based community RE capacity was in Scotland, with wind power being the most common technology [Harnmeijer et al., (2013), p.10]. There is a large diversity of schemes supported from turbines, wood heating or solar panels for very small village halls to large schemes feeding into the grid (http://www.energyarchipealgo.com). The primary aim of this paper is to consider the extent to which cultural and institutional factors mediate geographical differences in uptake.

First, we examine some theory that forms a basis to explore geographical differences in community renewables deployment. Then we study the policy context in relation to RE development in the UK. Then we analyse community renewables in the nations and regions using the tools we have developed in the theory section. Finally, we reach some conclusions.

2 Theoretical framework

Curtice (2013) summarises research on comparative social attitudes in Scotland and England, suggesting that 'the balance of opinion in Scotland is only a little more social democratic than that in England'. Fyfe et al. (2006) indicate a strong orientation of the devolved Scottish Government towards supporting third sector initiatives. Jarvie (2004) promotes the concept of communitarianism as a feature of Scottish sport. Communitarianism is evident in other areas of Scottish policy such as community land ownership (Bryden and Geisler, 2007). Here we assume that 'communitarianism' follows from a more egalitarian outlook.

We investigate the influence of political differences on institutional arrangements through the lens of community renewables. According to Hall and Taylor (1996, p.938)

institutions are 'the formal or informal procedures, routines, norms and conventions embedded in the organisational structure of the polity or political economy'. One possible explanation of differences between Scotland and England in community renewables developments is institutional arrangements. These may exist and produce differing outcomes, in particular favouring more communitarian approaches in Scotland, despite the modest differences in social attitudes observed (Curtice, 2013; Rosie and Bond, 2009). In rural and community development policy in Scotland, there is a strong strand of communitarian sentiment, evidenced in community-based land reform (Bryden and Geisler, 2007) which connects to RE policy (Slee and Harnmeijer, 2017) where access to land for developments is often critical.

A 'cultural approach' to institutionalism "emphasizes the extent to which individuals turn to established routines or familiar patterns of behaviour to attain their purposes" [Hall and Taylor, (1996), p.939]. We note also that policy communities in Scotland include many institutions that are quite separate from English or UK institutions (Keating et al., 2008).

A question arises, however, regarding whether it is possible to categorise, and therefore to compare, differences in the cultural basis of institutions. A system of categorisation that captures some possibilities of differences between Scotland and England may be appropriate for this purpose. We can then investigate the evidence to see whether there is a difference in the way that the categories measure the institutional arrangements in the different places. According to Dryzek et al. (2003, p.43) the UK in practice is tempered by the experience of Thatcherite 'authoritarian liberalism' entailing the imposition of a free market agenda, a corresponding suppression of civil society, and an 'individuation' of social and economic life that 'undermines the conditions for public association and action'. If Scotland is more 'communitarian' in institutional terms, one would expect different institutional arrangements in Scotland.

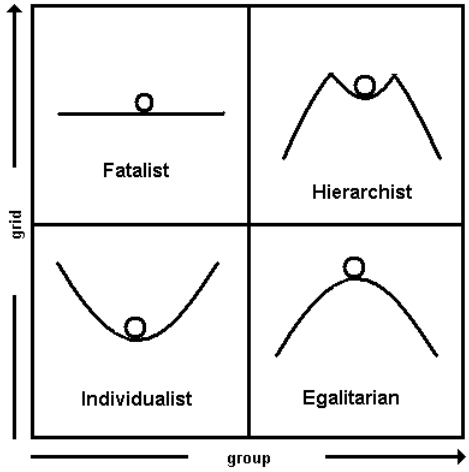
'Cultural theory' (CT) can be used to categorise and analyse the extent of such cultural differences in particular fields. This presents a typology of cultural differences that enable analysis of institutional arrangements in different parts of the UK. CT (Douglas, 1974, 1982; Douglas and Wildavsky, 1982) divides cultural attitudes to social organisation into four types: fatalism, hierarchy, individualism and egalitarianism (Figure 1). In this 'grid' versus 'group' scheme there is a comparison between people who follow rules (grid) and those who follow others on the basis of group identity. Both fatalists and hierarchists emphasise following rules, whilst hierarchists and egalitarians emphasise group solidarity – leaving individualists who favour neither rules nor group solidarity. The combination of group solidarity and rule following produces hierarchy. Hood (1998) explores how these categories might be applied in relation to the organisation and actions of the state.

A CT typology allows comparisons to be made regarding the organisation of community renewable schemes, programs, and related institutions – namely, whether there are individualist, egalitarian, or hierarchical (or simply fatalist) arrangements. Such categories form a potentially useful means to explore alleged differences between Scotland and the UK. Might differences in Scotland be attributed to more egalitarian policies and institutions?

Fatalists (strong on grid, weak on group) believe that outcomes are contingent on the 'unpredictability of human affairs' [Hood, (1998), p.152], emphasise following rules and assume little or no cooperation between people. Egalitarian (weak grid, strong group) attitudes give priority to participation and favour decentralised decision making. An

'individualist' (weak grid, weak group) approach prioritises competition between individuals with few constraints through rules or 'group' affiliations. A hierarchical (strong grid, strong group) worldview tends towards "…socially cohesive, rule bound approaches to organisation…" [Hood, (1998), p.8]. In practice, institutional arrangements will reflect combinations of these biases. Differences may emerge in the way that different biases predominate in different contexts.

Figure 1 Cultural attitudes to social organisation



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Communitarianism is likely to be associated with egalitarianism. In the case of locally owned social institutions, including those concerned with community renewable schemes, (where local actors participate on a decentralised basis), communitarianism' and 'egalitarianism' will closely overlap.

CT analysts maintain that institutions mirror prevalent social heuristics which can be analysed using CT. According to Swedlow (2011, p.704):

> "CT contributes significantly to institutional accounts of politics by specifying the types of institutions that can exist...Events and behaviour that are anomalous from one cultural perspective, and/or better explained or understood from another, can be catalysts of cultural change for both individuals and institutions."

In the environmental planning sphere, Hendriks (2004) utilises a cultural approach to associate different institutions with different cultural biases and so help explain outcomes. He discusses how more egalitarian approaches involve an emphasis on involvement of individuals and citizen groups in the planning processes and concludes that well-organised egalitarian approaches involve more positive outcomes compared to 'hierarchic' approaches. The approach here is to better understand how particular institutions are associated with one or other of the four cultural biases and then to analyse how these cultural biases frame outcomes. This approach is followed in this paper.

Dryzek et al.'s (2003) characterisation of Britain as authoritarian liberalism suggests a mixture of individualism and hierarchy. If Scotland is different then we might expect to see more egalitarianism and less individualism, and a relative preponderance of

non-hierarchical institutional architectures compared to the rUK. The categories used by CT can thus potentially help us analyse cultural differences in the sphere of the community RE policy.

3 Community renewables

We first need to consider how community RE schemes map onto these categories. First, there is the issue of their scale and absolute number. *Ceteris paribus*, if there are more community RE schemes pro-rata (for the population) in one nation then we can cite this as prima facie evidence of cultural difference – but we also need to consider what institutional factors might account for this concentration if it is to have theoretical significance. Other factors being equal, a greater number of schemes imply greater local participation in RE provision, which in turn implies a more egalitarian tendency in institutions. This relationship is complicated by other possible influences on uptake such as the quality of renewable resources, access to finance and opportunities of connecting to the grid (Haggett et al., 2013).

Community energy initiatives can be seen as quintessentially communitarian endeavours. They are also place-based developments where local communities decide on local development opportunities. They are strongly evidenced in EU and Scottish policies (Fyfe et al., 2006; Bachtler, 2010; Mair et al., 2011). However, there are gradations in the extent to which RE schemes can be considered egalitarian and communitarian. Literature on community renewables tends to define the extent to which schemes are 'community' by reference to three factors: first, the extent to which they are based on a particular place; second, the extent to which people in that particular place are active participants in the scheme; and third, the extent to which local people benefit from the project (Walker and Devine-Wright, 2008b; Walker and Cass, 2007; Walker and Devine-Wright, 2008a). Essentially, the more the community renewable schemes fit these criteria the more they correspond to the features of the 'egalitarian' category in CT.

Community schemes are often described as being 'cooperative' in nature. However cooperative organisation can itself involve 'individualist' as well as 'egalitarian' drivers because many RE cooperatives involve share offers with schemes owned through individually-based shareholdings (Bauwens and Defourney, 2017). Alternatively, schemes can also be owned by a local development trust, or local social enterprise which exists to provide services to the community in a more overtly collectivist and egalitarian model.

Hence, different cultural categories may apply to different types of community renewables schemes including 'egalitarian', and 'individualistic' cultural elements. Designs which involve organisation on an 'individualistic', 'market' approach could be considered as being different to those organised by a collectivist/egalitarian approach. For example, the widespread practice of funding schemes by share offers so that shareholder could earn a profit could be considered to be a market-based individualistic approach. The cooperative organisation – a mode of group endeavour – gives them a somewhat egalitarian aspect. Hence this type of community renewable project case comprises a mixture of individualist and egalitarian approaches. Such schemes may often comprise little more than crowd-sourced projects with wealthier investors benefitting from a larger shareholding.

Alternatively, schemes could be organised by a local community development organisation typically, a community development trust ('CDT' hereafter). These are legally constituted independent local institutions based on: local community ownership; seeking sustainable regeneration; working in partnership with others; engaging in income generating activity (DTAS, 2017). This is a solidly egalitarian and communitarian design for developing locally owned RE schemes. CDTs are established to promote place-based interests and the schemes would be owned by the community. Not only are there clear differences in the way that community RE schemes are organised in different parts of the UK but also there are be differences in the pattern of activities of the CDTs themselves. Some are more oriented to the provision of collective goods for the local population such as the creation of local park amenities, or the provision of energy efficiency. Other CDTs may be more concerned to support local businesses through training or promotion. Development trusts exist in all parts if the UK and operate similarly but are more prevalent in Scotland.

To varying extents, centralised 'hierarchical' influence from Westminster or Holyrood also direct and shape the nature of community energy. In Scotland, the initial emphasis on CDTs was encouraged through the Scottish Government's community energy fund ('CARES') and an agency ['Community Energy Scotland', (CES)]. Until 2015, cooperatives were ineligible for CARES support, thus favouring the development trust model in Scotland. More recently, 'community' participation can be seen as centrally prescribed by mandating community participation in commercial RE developments. This might include selling a minority of shares to locally-based individuals, although in practise most of such 'community' shares are held by distant investors.

We should also consider what reasons there are for the differences between community renewables in Scotland and the rUK, both in terms of the number of schemes and also differences in the ways they are organised. For this contextual difference, we need to examine the institutional backgrounds of different parts of the UK as they relate to the possibilities for establishing community RE schemes. In order to do this, we need to study the nature and extent of the capacity for organising community renewable schemes. Part of this can involve a study of the nature and extent of capacity of organising developments in the community. This may throw some light on the extent and nature of community RE schemes in different parts of the UK.

Hence we frame two hypotheses:

H1 There are differences in the organisation of community renewable schemes in Scotland compared to other parts of the UK, manifested in different legal structures and business models.

H2 These differences can be ascribed, in part, to a more egalitarian mode of organising community renewables in Scotland as opposed to other parts of the UK.

4 Methodology

In tackling this subject, data on community RE projects in the UK are analysed by accessing the extensive Energy Archipelago (http://energyarchipelago.com) dataset used previously in reports by Haggett et al. (2013) and Harnmeijer et al. (2013). Data

collection and analysis methodology is described in Harnmeijer et al. (2012a, 2013), and online at: https://energyarchipelago.com. The database was constructed and maintained through intensive telephone and web-based surveying and follow-up research of individual community projects throughout the UK. The key criteria for inclusion of projects in our study were the involvement of a place-based or interest-based social enterprise, together with evidence for both actual participation and collective benefits. In the case of non-charitable organisations, articles of association were used to assess the presence of a motivation to generate collective benefits over and beyond company profit. Where the main business activity was based on an alternative economic activity, such as housing, charitable status was a prerequisite for inclusion. For-profit housing associations with independent charitable arms espousing a social/environmental mandate, for instance, were also included. We included community councils in our definition of 'community', but not local authorities. Early findings based on the preceding methodology (Harnmeijer et al., 2012b), closely matched those of a separate study commissioned by the Scottish Government (Lyon, 2012).

In the analysis, emphasis has been placed on projects that have been completed or which are near to completion. The projects have been categorised according to a range of variables, including the regions in which they are located. Attention has been paid, *inter alia*, to the type of organisation and form of ownership of the community renewable projects.

In addition to this, the differential nature of CDTs in different parts of the country is explored. Community renewables projects have been widely deployed by non-government actors in pursuit of objectives involving collective gains for the local communities rather than private profit. The local development environment is considered important in order to assess the differences in local 'community' development institutions across the UK.

5 Policy development

Community RE in the UK can be seen to have developed in two main streams. The first was the 'cooperative' stream, in which some form of industrial and provident society ('IPS', 'energy cooperative') is established. The second is a CDT model.

The energy cooperative represents the dominant legal structure for community energy at a global level. Projects are funded and controlled by shareholders, and each individual shareholder has a single vote irrespective of shares held. This is the basis of the best known RE cooperative in the UK, the Baywind Co-operative formed in 1996 when a windfarm was developed in Cumbria in 1997. Since then a number of other ventures, most recently often involving solar photovoltaic ('solar PV') projects, have been organised. These are generally called community renewable projects, even though the shareholders may not always live nearby. Energy4All was formed as a spin off from Baywind, with the specific objective of establishing further cooperatives. Baywind have also worked collaboratively with commercial RE companies such as Falck Renewables (Scotland) and Wind Prospect (England).

Investors in cooperatives have benefited from significant tax relief through the Seed Enterprise Investment Schemes and Enterprise Investment Schemes ('SEIS' and 'EIS'), favouring high rate tax payers. Indeed, this financing mechanism is now favoured by the UK Government for implementing its community energy strategy (DECC, 2013). On the

6th of April 2015, a new scheme, called social investment tax relief ('SITR'), was introduced.

Financial advantages such as these can be accompanied by a weakening of the association and sense of ownership by the local organisation. Haggett et al. (2013, p.18) note that: 'share issues may threaten the 'local nature' of community projects, and have the potential to lead to local opposition to projects which may be regarded as benefitting distant investors. Moreover, the cooperative model may lead to perceptions of discrimination if the minimum buy-in cost is high'. We note, however, that the minimum buy-in on energy cooperatives has steadily dropped over time, and the public can often invest as little as £50 in more recent projects.

The second stream of development was focused in Scotland, and involved the deployment of community RE schemes by CDTs. These are typically incorporated as companies limited by guarantee, with charitable status. The use of renewables revenues for local community benefit is 'locked in' through the CDT's constitution. Usually the CDTs pre-date the formation of the plans for RE, and renewables assets are held in fully-owned trading subsidiaries. Around 2000, the Highlands and Islands Executive (HIE) had become interested in promoting community renewables as a means of supporting rural community development as well as deploying RE. A program was launched in 2002 called the Scottish Community and Household Renewables Initiative. This initially gave grants to support RE schemes, often based around CDTs. This initiative spawned the Highlands and Islands Community Energy Company ('HICEC') (Van der Horst, 2008) which later morphed into CES. This strategy was aimed at supporting remote Highlands and Islands' communities, which are recognised as being on the 'periphery' of resource links (Murphy and Smith, 2013). Local communities could derive income for community development from the schemes. Similar development grants were later made available through the Scotland-wide CARES scheme, a program first delivered by CES and later Local Energy Scotland which gave grants and (from 2011) loans to help communities with initial planning and technical costs associated with launching community renewables projects. Here we can see the intervention of a regional government agency which connected to local level agency.

CDTs have generally raised capital by borrowing loans from ethical investment funds run by for example Triodos or the Cooperative Bank. More recently, debt finance has been available through the renewable energy infrastructure fund ('REIF'), and increasing numbers of main-street (Santander, Close Brothers) and other banks (Green Investment Bank) are now lending or planning to lend to community energy schemes. Although this is usually more expensive (in terms of interest rates) and offers less flexibility compared to the crowd-funding by cooperatives, in Scotland this has often been offset by the presence of pre-planning financial support from CARES, as well as a superior wind resource. As we explain below, the dominance of CDTs in Scottish community renewables started shifting in 2013/2014, with an increase in renewables cooperatives.

The shift of CARES administration from CES to the Local Energy Scotland consortium may well be a reaction to CES's policy preference for CDT-based developments rather than cooperatives funded through share offers. Indeed, according to Smith (2014, p.35) "CES did not consider bona-fide co-operative schemes to represent their vision of CE." Commenting on a particular project involving a cooperative share offer, the CEO of CES said that

> "It's a community scheme insofar that I think most of its investors are from the wider Ross-shire community and in particular the farming community. However, its purpose is not to support local community development per se, but to generate income for its private investor-members." [Gubbins, N., personal communication, 31 July 2014, (Smith, 2014)]

CES thus had an understandable preference for developments through CDTs given evidence that trust schemes offer a much greater proportion of their revenue to community projects rather than rewarding private investors. Since the change in management of the CARES program (in 2013) there is now a greater emphasis on organising community renewable schemes through cooperative share offers. Some examples of this 'new wave' of cooperative schemes are shown in Table 3 in the later section discussing deployment of community renewables.

More recently, the Scottish Government set a target of achieving 500 megawatt ('MW') of community renewables by 2020, but modified the definition of 'community renewables' to include small scale private schemes by farmers and landowners. Had it wanted to further reinforce community ownership this could have been achieved either by an enhanced FiT or by obligating local authorities to factor in the enhanced local socio-economic benefits arising from community-owned schemes in planning decisions (Slee, 2015). Moreover, the Scottish Government now supports a strategy of community renewables being organised in collaboration with mainstream RE companies. An official commented that 'taking a smaller share of that risk in a larger commercial development is often a much better way for them (the community) to invest.' The Scottish Government is moving in concert with DECC officials to implement this approach (DT personal communication with senior civil servant in Scottish Government, 17/02/2015). At UK level, Ed Davey, the former energy minister stated that: "Engaging private sector renewable developers in community shared ownership schemes offers a new partnership model" [DECC, (2014), p.4]. Such a strategy implies emphasis on local communities being given shareholdings or other types of community benefits in schemes organised by commercial developers. This differs from CES' vision. The difference of emphasis perhaps reflects the desire of CES to change the ground rules of energy production (see Becker and Kunze, 2014).

Hence, we can see that structural influences are shaping the direction of community renewables policy in Scotland towards with what is happening with the rUK, with governments encouraging communities to collaborate with the mainstream energy industry.

In terms of the definition of community RE schemes discussed earlier, such policies may be directed as much to gaining more local acceptance and benefits from commercial schemes as organising schemes that are wholly community owned (Strachan et al., 2015). This policy, now favoured by both UK and Scottish Governments, implies that in the future community renewable ownership is likely to emphasise partial community ownership of commercial projects.

The reliance on providing community shares in large mainstream RE projects would seem to have a substantial 'hierarchical' element as the community element is initiated and provisioned using a top-down process. The project is organised by an outside agency (to the local community) and also driven by a central government policy process. This results in a mix of community energy schemes whereby both cooperatives and CDTs own stakes in mainstream commercial developments.

Policy on community renewables certainly developed earlier in Scotland (circa 2000) compared to other parts of the UK. Community Energy England was established in 2013, along with a Rural Community Energy Fund and in 2014 an Urban Community Energy Fund was set up. Community Energy Wales has become an active player in Wales, and several intermediary organisations have facilitated the launch of community energy projects in Northern Ireland.

Parallel to these developments there have been major changes in the industry-wide (as opposed to community-specific) support mechanisms for RE. The first consistently available fund that community renewable schemes could access was the renewables obligation ('RO'), which was introduced in 2003. The associated renewable obligation certificates ('ROCs') were sold onto electricity suppliers to help them meet their obligations to supply a target proportion of their electricity from renewables. However, the FiT scheme which was launched in 2010 gave a major boost to smaller projects and has been generous for projects up to around 1 MW.

State aids rules (relating to EU rules for public support) have presented enormous problems to many community energy projects, because eligibility for FiTs support is compromised if capital costs are supported by grants. As a project representative in Aberdeenshire says, "The feed-in tariff with no grant was better than ROCs with grant. We did the analysis and it was very clear which way to go" (DT personal communication with project manager of community renewable wind development in North East Scotland, 14/11/2014). Larger schemes have used the RO, although this is now replaced by the 'contracts for difference' ('CfD') scheme for which there is greater competition for funding because of spending caps imposed by the Treasury.

6 Deployment of RE: Scotland and the rUK compared

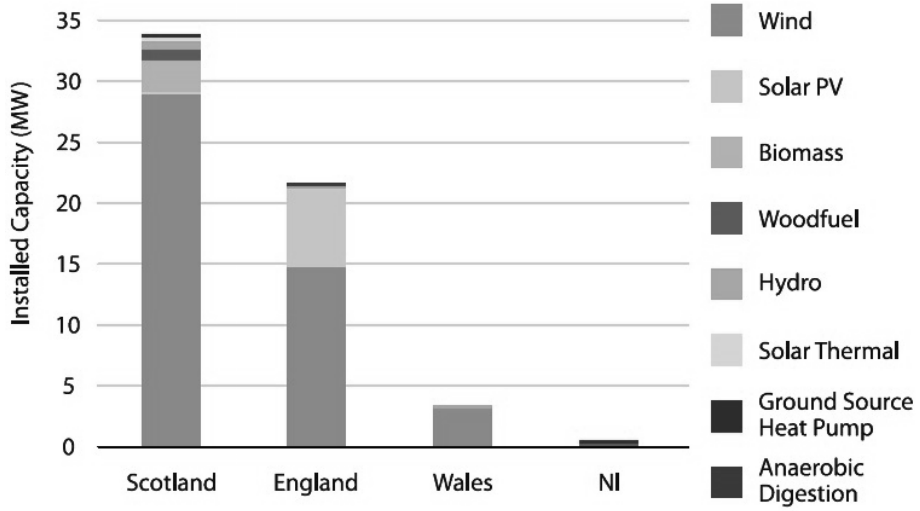
Figure 2 shows that the majority of UK community renewables capacity, up to 2013, was deployed in Scotland. Most comprised wind power schemes. Later, England saw growth of community solar PV, the continued growth of which has considerably changed the subsequent picture (Community Energy England, 2017). The actual numbers of projects are shown regionally in Table 1, which shows that solar PV and onshore wind predominate.

Table 1 Community renewable technologies in 2017 in the UK by region

	Total	*Scotland*	*England*	*Wales*	*Northern Ireland*
Bioenergy	11	8	2	1	0
Hydro	28	8	14	6	0
Solar PV	114	16	87	9	2
Solar thermal	1	0	1		
Wind	62	46	12	3	1
Heat pump	3	3	0	0	0
Other	1	0	1	0	0
Total	*220*	*81*	*117*	*19*	*3*

Source: Energy Archipelago database (2017)

Figure 2 Community renewable project capacities in 2013 in the UK by region



Note: 'NI' = Northern Ireland.

Source: Harnmeijer et al. (2013)

Table 2 shows the big difference between Scotland and other parts of the UK in terms of the mode of organisation of community renewables. Whereas the bulk of schemes are organised by CDTs (or some other type of social enterprise or charity) in Scotland, in England and Wales most schemes have been organised through cooperatives.

Table 2 Community renewable organisational form in 2017 in the UK by region

	Total	*Scotland*	*England*	*Wales*	*Northern Ireland*
Cooperative type	117	5	102	8	2
Development trust type	40	39	1	0	0
Others	63	37	14	9	3
Total	*220*	*81*	*117*	*17*	*5*

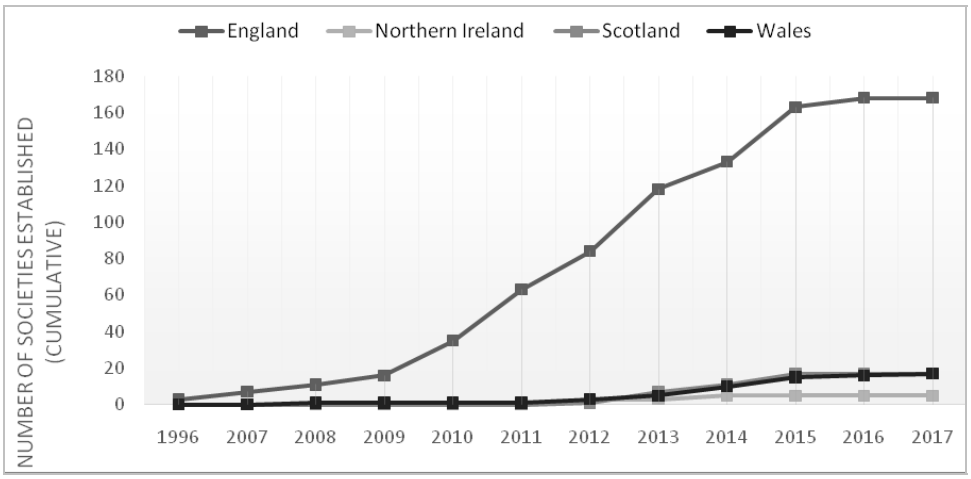
Source: Energy Archipelago database (2017)

The dominance of CDT organisation in Scotland can also be seen more widely in community energy projects (which can also often involve energy efficiency and 'carbon awareness' projects), as seen in Table 2 and Figure 3. This suggests that CDT organisation of RE projects is part of a wider trend of working through CDTs as local sustainable development hubs.

This also implies a different approach between component parts of the UK to sourcing funds for capital costs, with Scottish schemes tending to borrow money from banks in the form of loans whilst in England funding is dominated by issuing shares to individuals. This implies a different conception of community benefit. The CDTs, which own the bulk of the Scottish community projects, serve a defined geographical area. On the other hand, share-issuing cooperatives are not as strongly place-linked to a defined area since the shareholders often come from different places (although many make strenuous attempts to connect to local shareholders).

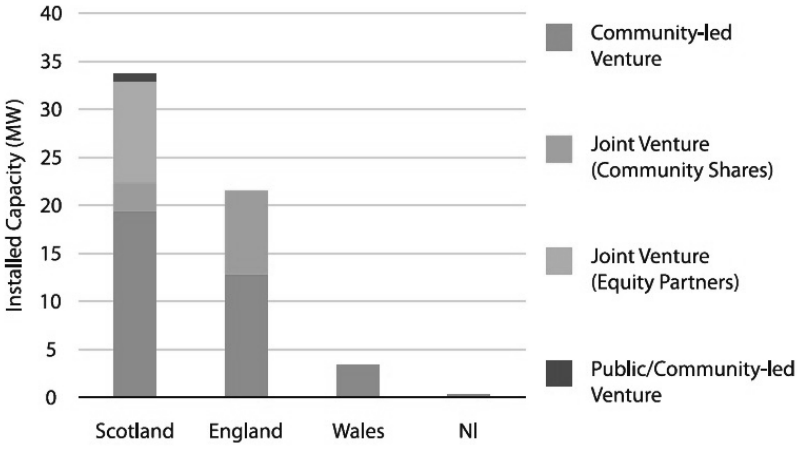
Figure 4 shows that by late 2013, a sizeable minority of community renewable development by capacity existed through partnership arrangements with commercial RE developers. However, it should be noted that the split between different types of ownership is based on (in Figure 4) capacity installed. If it were based on the numbers of projects then the proportion of schemes that involve community-commercial partnership arrangements would be much smaller. This is because on average fully-community-owned schemes are much smaller than 'mainstream' commercial schemes (Harnmeijer et al., 2015; Berka et al., 2017).

Figure 3 UK energy cooperatives over time, by region



Source: Energy Archipelago database (2017)

Figure 4 UK community renewables in 2013 categorised by ownership structure, by region



Note: 'NI' = Northern Ireland.

Source: Harnmeijer et al. (2013)

7 Evidence from different local institutions and intermediaries

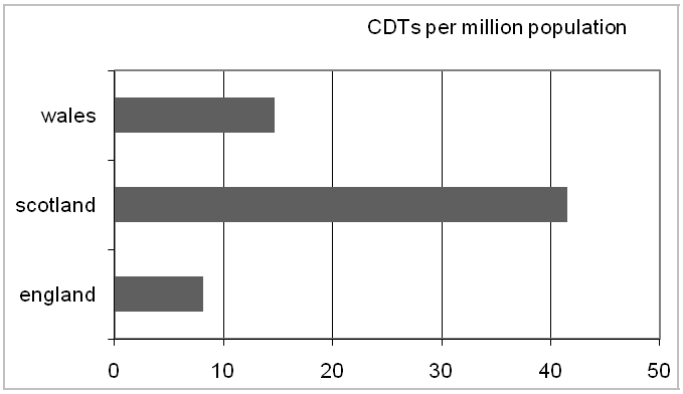
The heavy reliance of community renewable development in Scotland on CDTs (compared to England and Wales) demands explanation as in the rUK, cooperatives predominate. Therefore, both are analysed.

The only data on cooperatives is the database organised by Co-operatives UK (2015), with which cooperatives are usually affiliated. Overall, there seems to be little overall difference between Scotland and the rUK. Some 8.6% of the (6,378) cooperatives listed in the whole of the UK are based in Scotland, a figure which is almost identical its proportion of the UK population. There are, however, major differences in the types of coops with many sport and social clubs in England but few in Scotland and more credit unions and agricultural coops in Scotland. Only a small proportion of these cooperatives involve share offers. A search revealed just 102 in the UK that were associated with RE activities, of which 13 were in Scotland, eight in Wales and the rest in England.

There are much starker within-UK differences when it comes to CDTs. Data were derived from the database of the Development Trust Association Scotland (DTA Scotland, 2015), Development Trust Association Wales (DTA Wales, 2015) and Locality (2015). We analysed the numbers, activities and funding of the CDTs in the three nations (Scotland, England, Wales). We did not have sufficient data for a comparison involving Northern Ireland.

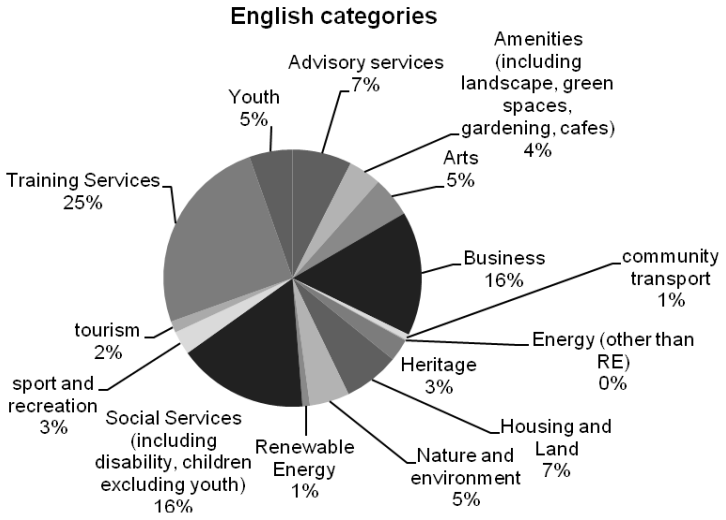
The number of CDTs is proportionately greater in Scotland compared to England or Wales (450 CDTs in England, and 217 CDTs in Scotland). Scotland's population is less than a tenth of the population in England. Figure 5 shows a comparison per million of population with around five times as many CDTs in Scotland as England on this (per million capita) basis. CDTs are not only a rural phenomenon – the ratio of CDTs to population in the Glasgow and Clyde area, for example, is little different to that for the whole of Scotland.

Figure 5 Comparison of number of CDTs in each nation per million of population



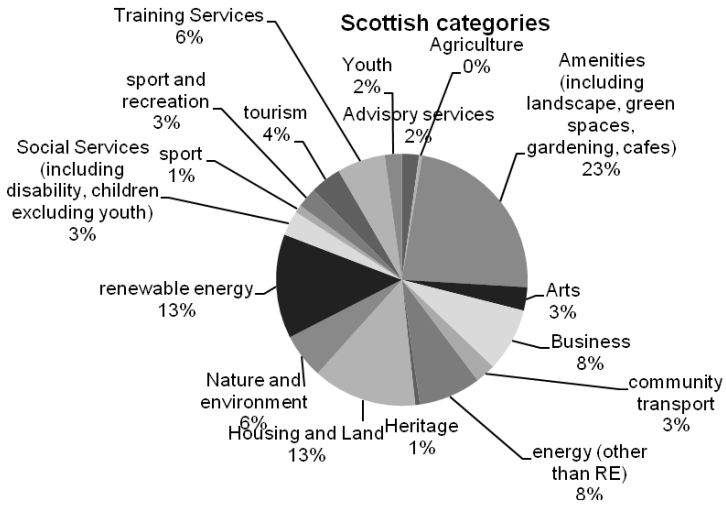
Source: DTA Scotland (2015), DTA Wales (2015) and Locality (2015)

Figure 6 Activities of English CDTs



Source: DTA Scotland (2015), DTA Wales (2015) and Locality (2015)

Figure 7 Activities of Scottish CDTs

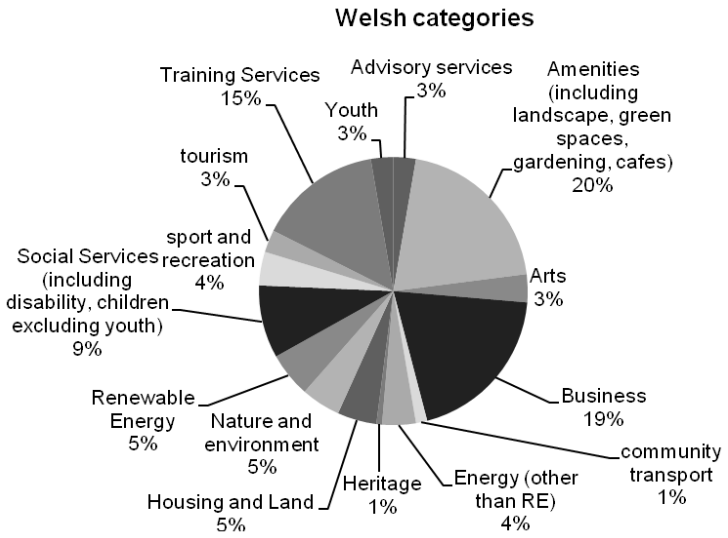


Source: DTA Scotland (2015), DTA Wales (2015) and Locality (2015)

An analysis of the activities performed by the CDTs was carried out, based on their directory entries. We devised sub-categories for these diverse entries in order to make for easier comparison using a manageable number of categories. The results are shown in Figures 6, 7 and 8. There are some clear differences between the three nations. In England, there were very few RE (0%) or other energy activities (1%). In Scotland, 13% of activities were related to RE and 8% to other energy. 'Other energy' usually refers to energy efficiency or related environmental activities such as 'carbon awareness'. In Wales 5% of activities were in RE and 4% in other energy. However, what was also

interesting was that in England, 43% of activities could be classified as business support and promotional activities. In contrast, in Scotland only 14% of activities were related to business or training. In Wales, the figure for such economic-related activity was 37%. In Scotland, the bulk of activities were related to providing goods for collective consumption, such as providing cafes, organising open spaces for landscape, gardening or housing or, as stated, various energy services.

Figure 8 Activities of Welsh CDTs



Source: DTA Scotland (2015), DTA Wales (2015) and Locality (2015)

What this suggests is that not only is there a higher density of CDTs in Scotland compared to England, but also the activity of the Scottish CDTs is much more oriented to providing 'collective' goods or services to local people. By contrast, in England there is a relatively much higher proportion of activities directed towards business support and promotional activities than Scotland, and less on providing 'collective' goods and services.

8 Discussion

A cultural frames perspective on policy formation provides a useful means for exploring both divergence and convergence in RE policy in the UK. Sub-national influences have shaped the policy support means. The early development of the Scottish community renewable program by CDTs, often on islands or in the highlands of Scotland, can be seen as an effective approach by an arm's length Scottish governmental agency to exploit an emergent opportunity for community development. High wind speeds in such locations were important, as was a desire for greater community self-sufficiency, driven by the existence of strong CDTs. Indeed, in some places (e.g., Eday, Orkney) grid connection was a very recent phenomenon. This practice then spread outside the Highlands and Islands. It was a conscious decision to employ the 'distinctly

communitarian' institution of the CDT in Scotland to implement community renewable projects.

Hence, it can be seen that the development of community renewables is strongly reliant on the existence of this local communitarian/egalitarian institutional context manifested in strong CDTs. CDTs still had to be able to raise money at reasonable interest rates from banks or public-sector lenders and after the financial crisis, which began in 2007, obtaining bank finance became more challenging. In contrast, the use of cooperative share offers has predominated in England. In the English case, there are proportionately fewer CDTs. Moreover, such CDTs as there are appear less oriented toward collective goods and more towards improving market-based economic activities.

Therefore, in terms of the 'cultural' frames discussed earlier, there seems to be a consistent linkage between 'egalitarian' communitarian local institutions and community renewables in Scotland. By contrast, in England, and to a slightly lesser extent in Wales, there is more of a mixture of egalitarian and individualist frames underpinning both local institutional arrangements with less communitarian-oriented CDTs generally and a usual practice of cooperative share offers. These offers give ownership to individual shareholders rather than local institutions but may offer donations to local trusts. Moreover, there is a much greater proportion of community renewables in Scotland compared to England and Wales (pro rata for the population), suggesting greater egalitarianism in Scotland.

Arguably the lack of CDTs in England compared to Scotland may comprise evidence of a more 'hierarchical' approach since implicitly there will be a greater reliance on formal government institutions to provide local collective goods and services. However, there is also some evidence of 'hierarchy' in the way that the Scottish Government has recently led development of community renewables, first basing them almost exclusively on bottom up CDTs, then supporting the shift to cooperatives. This bottom up vs. top down debate is also discussed by Kitzing et al. (2012) with respect to EU and national policies and they detect a growing convergence in national and EU policy.

Table 3 The first wave of Scottish energy cooperatives in 2013–2014

Name	*Location*	*Technology*	*Scale (kW)*	*Date share raise commenced*
Dingwall	Dingwall	Wind	250	Sep. 2013
Garmony	Mull	Hydro	400	Nov. 2013
Harlaw	Midlothian	Hydro	65	Apr. 2013
Islay Energy	Islay	Wind	330	Jan. 2014
Spirit of Lanarkshire	Nutberry (near Coalburn and West Browncastle)	Wind	Revenue share on 15,000 kW and 30,000 kW wind farms	Jun. 2013
Sunart	Strontian	Hydro	100	Oct. 2014
Urras	Lewis	Wind	1,800	Oct. 2014
Wester Derry	Kilry (near Alyth)	Wind	250	Apr. 2014

Source: Energy Archipelago database (2017)

Since 2013, the Scottish Government's emphasis has shifted more towards allowing cooperative share offers (Table 3) and shared commercial-community ownership models as part of both Westminster and Scottish governments emphasising community renewables as a component part of conventional RE projects. These models tend to be more open to involvement by non-local stakeholders than are typically highly local – development trusts that are fully community-owned. In consequence, this policy direction may lead to furthering rather than reducing estrangement between local communities and renewables developments. In the future therefore, the community renewables sector may expand, but with an emphasis on collaboration with conventional RE companies. A downside of this approach is that it makes community renewables an adjunct to the conventional RE industry rather than a free-standing movement.

9 Conclusions

In this paper, modes of organisation within the UK community energy sector were subjected to regional comparison, and analysed through the lens of CT. Two hypotheses were developed:

H1 There are differences in the organisation of community renewable schemes in Scotland compared to other parts of the UK, manifested in different legal structures and business models;

H2 These differences can be ascribed, in part, to a more egalitarian mode of organising community renewables in Scotland as opposed to other parts of the UK.

The first hypothesis is supported by evidence obtained. Scottish community energy has until recently tended towards a distinctive form, that we assert reflects the more egalitarian nature of community renewable ownership in Scotland. Further, ownership of community renewable projects through CDTs is a more insistently local and collective mechanism compared to the cooperative share offer schemes in England and Wales. Cooperative share offers are inherently less locally inclusive and more individualistic than the more the 'locally collective' and communitarian CDT model.

Hence there is also evidence for the second hypothesis in that the existence of more egalitarian forms of community renewables organisation in Scotland via CDTs. In England, CDT traditions are much weaker. In short, community renewables in Scotland were associated with a more egalitarian institutional pattern compared to England which, in contrast, seems more oriented to a more individualistic pattern of institutions.

In Scotland, government agencies initiated the community renewable program with CDTs the initial legal form of choice. However, the emphasis changed in 2013, as the Scottish and Westminster governments developed a policy of integrating community renewable ownership into commercial renewable projects. It is possible that the CDT model was appropriate in the window of opportunity after high rate feed in tariffs for smaller schemes were introduced in 2010 and when the CDT model had already been tested in practical applications in the Highlands and Islands, but the greater density of CDTs in Scotland and their stronger community focus than those in England does suggest a more communitarian orientation.

The policy emphasis is now more fluid in Scotland towards community development using cooperative share offers, a mode that is already dominant in England. There is thus evidence that the early distinction between Scotland and England may be breaking down. Government policy, meanwhile, is now more oriented towards integrating community renewables projects into the commercial developments. In this sense, even 'community' renewable strategy in the UK may be shifting more towards a form of 'hierarchical neoliberalism' whereby RE markets are opened up by prescribing top-down rules of engagement with local communities.

We observe a paradoxical trend towards a more individualistic orientation of community energy schemes in the UK. The more communitarian and potentially transformative nature of many of the early developments has been supplanted by a predominantly crowd-sourcing approach, in which individuals become shareholders in clean energy systems. This may attract local investors and reduce local opposition, but it is less about offering an alternative to large-scale corporate clean energy production and more about taking the community sector under its wing. This has clearly increased engagement in terms of capacity, but at the same time undermined autonomous vernacular action.

There has been a subtle but important cultural reframing of RE governance, which has replaced a distinctly Scottish communitarian governance regime by a more universal individualistic ethos through crowd-sourced funding of community energy co-developed with mainstream clean energy developments. With this governance change, the scope for deepening community-based development has been lost and a social orientation of community energy replaced with something more pragmatic and more individualistic.

The existence of a more communitarian ethos to the early development of Scottish community renewables emerged contemporaneously with other communitarian policy initiatives, particularly with respect to land reform. Many renewables initiatives have taken place on community-owned land. This does suggest a distinctly different cultural perspective. But while the early years of community energy practices were steeped in communitarianism, a more pragmatic UK and wider European model of community ownership through cooperatives has now taken hold in Scotland, almost certainly to the detriment of wider rural development objectives.

We conclude that, for the UK at least, CT provides a promising explanatory framework for the stark regional differences in organisational forms identified in this paper. This being the case, community energy might present a clear example of a domain that benefits from bespoke, fit-for-purpose, regional policymaking that furthermore leaves appropriate space for local institutional innovation.

Acknowledgements

We gratefully acknowledge the assistance of Yvonne Toke in collecting and categorising data on CDTs. BS's and JH's contribution to this paper was developed under the SIMRA project, Social Innovation in Marginalised Rural Areas. This project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement No. 677622.

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