Transforming the energy system? Technology and organisational legitimacy and the institutionalisation of community renewable energy

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Abstract
Community renewable energy promises to play an important role in reducing the generation and consumption of high carbon sources of power, as well as in demonstrating the viability of novel business models within a transformed energy system built on principles of locality and democracy. The paper argues, however, that community renewable energy, in England at least, remains marginal, undermined by changing government policies and underplayed institutional factors connected with technology and organisational legitimacy. The paper reports on interviews with 29 actors connected with community renewable energy in England. The analysis identifies themes implicating various types of legitimacy with the partial and uneven institutionalisation of community renewable energy. These are bound up with continuing and new institutional rules and the deployment of strategies for (de)legitimising community renewable energy, including associated technologies and organisational forms, adversely impacting on the potential contribution of community renewable energy to energy system transformation.

Keywords: community energy; energy systems; institutions; organizational legitimacy; technology legitimacy, renewable energy, discursive strategies, England

Highlights:

- Novel focus on legitimacy-building in institutionalising community renewable energy
- Identifies legitimacy gaps faced by community renewable energy in England
- Uniquely analyses organisational and technology legitimacy and discursive practices

Word count: 7,717

List of abbreviations:
CE – community energy
CRE – community renewable energy
CREO – community energy organisation
DECC – Department of Energy and Climate Change
BEIS – Department of Business, Energy and Industrial Strategy
TIS – technological innovation system
RE – renewable energy

Declaration of interest: none.

1. Introduction

Significant state reductions in support for small scale renewable energy in the UK have been justified partly by the growth of community renewable energy (CRE) and reductions in the costs associated with technologies such as solar photovoltaics and onshore wind. Some researchers, e.g. Smith et al. [1], question the assumptions and limitations of a policy approach in which initial support for CRE is withdrawn gradually as it 'mainstreams'. Critics are wary of the technocracy of this kind of strategic niche management [2, 3] which, in their view, neuters the transformational potential of grassroots activism, as it co-opts CRE in 'incumbent-driven' strategies of 'niche advocacy' [1]. Rather, it is necessary to promote community energy activism which is capable of challenging the energy system 'mainstream' [1].

Recent research recognises the importance of legitimacy to the emergence of new innovation systems [4] and to the ability of niches to challenge incumbent energy systems and institutions [5, 6]. This paper asserts the centrality of legitimacy and practices of legitimation to institutionalisation of technologies and organisational forms relevant to diversification and decentralisation of energy generation. It argues that an analysis of both organisational legitimacy and technology legitimacy are required for understanding institutionalisation of CRE and its transformative potential [6].

The paper contends that organisations, individually and collectively, employ legitimacy-building strategies as they challenge, work with or around the energy mainstream [7, 8]. Thus, the paper identifies and categorises problems of legitimacy faced by grassroots community organisations in the CRE 'sub-field'. Such a designation recognises the structuring effect of the institutionalised energy 'field' on challenger organisations but allows for contestation therein from members of the sub-population of CRE [9]. The paper considers how CRE protagonists build, maintain but also lose legitimacy with key stakeholders (e.g. regulatory agencies or local residents). It considers how the case for CRE initiatives and particular technology choices is advanced discursively and how CRE actors justify their position within strategies of legitimacy- and coalition-building [10]. Further, the study

generates insights into the capacity of CRE to challenge prevailing orthodoxies which characterise policies, activities and inter-organisational struggles affecting the sub-field (c.f. [11, 12]).

Legitimacy refers to congruence with institutional pillars, which are the 'rules' which govern apparently – or deceptively – stable social relations [13]. Failure to adhere to such rules may incur denial of resources, formal sanction or disapproval of audiences whose support is necessary to the success of the organisation(s) in question [13]. For CRE, such audiences may be state and local authorities, providers of finance and technical expertise, or local residents.

The political, techno-economic and social structures and agendas are relevant to the legitimacy of CRE [4, 5, 6, 14]. The UK Community Energy Strategy states that transformative community-led action could stimulate investment, address local needs and involve local people and 'tackle challenges more effectively than government alone' [15, 16]. Yet in late-2015 the main state subsidies for community-scale renewable energy projects were drastically reduced [17] and in July 2016 DECC was dissolved. Meanwhile, the electricity generation capacity of CRE in England in 2017 was estimated at less than 150 MW and investment and project activity have stalled [18].[1]

It is essential to probe the strategies which might minimise legitimacy gaps (c.f. [6]). Such foregrounding is required to develop a richer appreciation of why, how and what changes in legitimacy occur and the implications of legitimacy for institutionalisation of CRE and the transformation of the energy system. Thus one needs to identify and analyse the legitimacy-building strategies deployed by community renewable energy organisations (CREOs) and attendant discursive 'legitimation strategies' manifest in their arguments for CRE.

The paper is structured as follows. Section 2 reviews relevant literature on the legitimacy and legitimisation of CRE, taking in the topics of organisational legitimacy, technology legitimacy, and political coalition-building. Section 3 outlines the methods employed to collect and analyse the data gathered for the study, whilst section 4 presents its findings. Section 5 is a discussion of these findings,

[1] Generation capacity for renewable energy for the UK in 2017 was over 18,200 MW [19].

in the context of existing knowledge regarding the importance of technology and organisational legitimacy to institutionalisation in and transformation of the energy system. Section 6 is a conclusion, which summarises the contribution to knowledge and future research agenda.

2. Literature Review

Community is not an unproblematic category; 'energy communities' [20, 21] or 'communities active in relation to climate change' [22] are recognised as internally complex and as sites of contestation, tension, and distinction [22]. Taxonomies of CRE emphasise the need to recognise differences between place-based and non-place-based initiatives and various motives of 'single purpose' initiatives and those motivated by other concerns as well as energy provision [23, 20]. They also note the extent to which community initiatives may be driven by private or collective interests and participatory rather than closed processes [24].

A critical view of CRE should understand the phenomenon (in the global north) within neoliberal processes of rolling back the state and the roll out of market techniques, taking less of a rose-tinted view of communities than tends to occur [22]. Further, CE is entangled with a range of different actors and institutions operating at different scales [25], and there needs to be more attention to normative (what is right to do) and cultural-cognitive (the way things are done here) types of institutional factors governing CRE, as regulative institutions have already received much scrutiny [26].

Bearing the above in mind, three emerging areas of concern here are: a) organisational legitimacy and the institutionalisation of community energy business models [14]; b) 'technology legitimacy' [6]; and c) the difficulty of creating and sustaining 'policy coalitions' which may enable CREOs to secure sufficient and stable funding for their activities [5].

Recent contributions point to the need to examine actor strategies for building of and struggles over legitimacy [6] and an appreciation of the interaction of technology, industry and organisational dimensions of legitimacy. Also, there is a need to investigate how strategies and possibilities (e.g. for coalition building) for grassroots organisations vary with political opportunity structures in different

contexts [10], balancing attention to both processes of incorporation and transformation of 'challenger' organisations and technologies [27]. A nuanced approach is required to transcend conceptions of 'established' and 'emerging' organisations, technologies and business models, in which what is important to institutionalisation and transformational potential is their legitimacy and not merely their novelty.

2.1 Organisational legitimacy

Organisational legitimacy assumes that organisations 'normally' act in a manner congruent with prevailing formal, normative, cultural or cognitive rules required or expected by cultural and political 'authorities…empowered to confer legitimacy' [13: 60]. A legitimacy gap here entails a lack of congruence therewith. Individual organisations can build legitimacy in three ways [7]: a) by conforming to conventions and values of existing environments and audiences; b) by selecting environments with favourable audiences; and c) through the manipulation of environments.

One can also identify a number of different dimensions of legitimacy that an organisation can try to build: pragmatic; normative; and cognitive [7]. For an organisation seeking to build on the 'pragmatic' dimension this would involve finding ways to identify and to satisfy the interests of particular constituents. The latter in return confer legitimacy on the organisation concerned, which also may manifest in commitments and resources favourable to that organisation. Four aspects of the normative dimension of legitimacy may be defined, all rooted in moral evaluations made by the organisation seeking legitimacy: a) a consequential aspect, which may be conferred to the extent that a constituent of a focal organisation considers that the latter fulfills (or has the potential to realise) certain ends; b) a procedural aspect, in which a constituent acknowledges the appropriateness of the processes adopted and practised by the focal organisation; c) a structural aspect, which concerns the adoption of expected organisational forms and structures; and d) a personal aspect, which turns on the charisma and qualities of (usually leading) members of the organisation seeking legitimacy. The cognitive dimension of legitimacy has, as the term suggests, roots in cognition connected with constituents' unquestioning of the need for, or the taken for grantedness of, the focal organisation.

One may distinguish between 'impositions' made on an organisation on the basis of influential authority and those which rely the exercise of coercive power [28]. Organisations, organisational forms or activities may be legitimate in the sense that they conform to social or professional norms, standards or expectations. Legitimate organisations, forms, or organisational activities may also derive authorisation from society to the extent that they conform to widely accepted cultural beliefs.

In each case there may be a number – or different types - of authorities conferring legitimacy on the organisation in question, including governmental agencies, professional bodies, subsets of society or the wider culture. There may be inconsistencies such that organisations may be legitimate to one kind of audience whilst illegitimate to another. One type of authority may evolve into, from, or overlay, another. For example, the legitimacy of an organisation may depend initially on the charismatic authority of a particular leader but may require support in the nature of formally authoritative sanction and/or cultural acceptance to ensure continuity. Enforced compliance may not outweigh or outlast adherence to rules rooted in voluntary conformance or normative pressure. Also, action taken to ensure conformity to one base of legitimate authority (e.g. corporations having a duty in law to act in the interests of their shareholders) may be in conflict with achieving conformity with another (the corporation acting in a socially responsible or ethical manner, which might subordinate profit-seeking activities). The process of gaining legitimacy involves moving over time between satisfying 'what matters' to an organisation and what is important to external audiences [29].

It has been argued, however, that such accomplishment will not occur in the absence of 'technology legitimacy' [6].

2.2 Technology legitimacy

Researchers have begun to address technology legitimacy [6], concerned with the match between renewable or low carbon energy technologies, policy arrangements and public support. Technology legitimacy is necessary for successful transformation of technological innovation systems over and above factors connected with the reliability of the technology, its ease of use and market formation [4]. A technology legitimacy gap may be understood as 'misalignment' between the technology and public

and political support 'elements in the wider context' [6: 300, see also 30, 31]. Such insights may be informative to the present paper, which focuses on a context (England) in which some renewable energy technologies, particularly onshore wind power, have been highly controversial.

Markard et al. (2016) argue that, in the case of biogas in Germany, the gain and subsequent loss of technology legitimacy may be explained in terms of first alignment of the biogas TIS with institutional structures of agriculture then also with those of energy as the two fields intertwined [6]. This is followed by misalignment due to institutional conflict between these fields as biogas technology matured. Markard et al. distinguish technology legitimacy from the legitimacy of technological innovation system actors but do not examine the latter in their study [6]. In contrast, the present paper is especially interested in the implications for the maturing of niches (or institutional 'sub-fields') such as community energy of both categories of legitimacy, which may coincide within a techno-organisational assemblage. In short, technology and organisational legitimacy may not be easily disentangled empirically even if they are analytically distinct categories (c.f. [6]).

Ornetzeder and Rohracher (2013) find that grassroots innovators provide legitimacy to niches such as electricity generation from renewable energy sources, by making technical modifications and adaptations which enable innovations to diffuse as they link up with broader societal discourses [32]. The paper acknowledges the fundamentally different sources of legitimacy of each type i.e. (normative) moral obligation and (socio-culturally) taken for granted belief. Further, it recognises the discursiveness of legitimacy-building for institutionalisation of CRE and the role of language in the politics of systems transitions, as discussed in the following sub-section.

2.3 Politics and coalition-building

A political perspective of transitions identifies 'mechanisms' [27] which allow coalitions to achieve their objectives in the face of opposition from politically powerful incumbents. Important mechanisms include mobilisation by grassroots and social movements, framing of arguments for change [33] and countervailing strategies (e.g. of financial entities) in support of policies for change. These mechanisms may challenge the mobilisation of incumbent regime actors to defend their prevailing positions and

activities, lobbying against policies which might promote regime transformation. The formation of alliances among 'countervailing' actors and grassroots initiatives/social movements may legitimise 'distributed' energy while incorporating local or activist-driven ownership models [27]. Rosenbloom et al's (2016) study of the formation of narratives of solar power in Ontario, Canada, advances discourse analysis as an approach to understand better how 'in transition episodes' people use language and networking to build the legitimacy of innovative socio-technical niches [34].

2.4 Closing 'legitimacy gaps'

CRE faces a double problem with respect to 'legitimacy gaps', which require investigation to understand better the challenges and opportunities for institutionalisation and change in the energy system. First, CREOs may be seen by influential constituents as being mismatched with existing institutional rules. Thus their legitimacy is questioned, possibly in relation to different bases of legitimacy. As the literature review argues, the different bases of legitimacy are rooted in distinct authority systems which should not be conflated analytically. Also, both technology and organisational legitimacy require analysis, whereas recent work has seen the former emphasised at the expense of the latter. Second, CREOs find it difficult collectively or individually to gain, build or maintain legitimacy for their values and activities and for changing institutional rules so that these would be congruent with the foregoing. Without this legitimacy, or if this legitimacy is not durable or pervasive, it is problematic for CREOs to garner the resources, support, and favourable policy commitments they need to flourish as active agents in the transformation of prevailing institutions. They attempt to acquire or maintain legitimacy, however, and so a view which recognises both the constraints on and possibilities for strategic grassroots action to effect institutional change is justified [35].

The prevalence of legitimacy gaps and their closure or transcendence is enmeshed with institutional structures acting on an organisational sub-field. The argument revolves around the idea that organisations seeking to pursue unrecognised activities or to operate in unconventional ways need to build legitimacy with influential audiences which may confer the status, resources and other support necessary to enable them to pursue their goals. As well as pursuing strategies which position sub-fields,

organisations and technologies in relation to broad or selected audiences and environments, the protagonists - collectively or individually - engage with discursive, coalition-building processes through which legitimation is built. This point remains implicit in existing literature but is brought centre-stage here.

2.5 Analytical framework

The paper builds on the recognition that legitimacy renders other modes of organisation or processes 'literally unthinkable', whilst verbal and non-verbal communication are fundamental to 'legitimacy management' (Suchman, 1995 [7], quoting Zucker, 1983 [36]). The paper distinguishes between organisational and technology legitimacy-building strategies, which are based on the identification or selection of target environments and audiences, and discursive processes of legitimation, employed to justify technologies, practices and organisational business models. Processes which may be constitutive of all these arenas of legitimacy relate to 'societal discourses' and the 'mobilisation' of 'context structures' but, more explicitly than prior research has recognised, through language and meaning making in practice. To counter resistance from external audiences, CREOs deploy 'rhetorical strategies' to build 'the necessary legitimacy for social change' [37].

Arguments may be deployed to legitimise renewable energy technologies and/or CREOs, or that of the CRE sub-field. Four types of 'legitimation strategies' have been identified in previous work [38] but not in relation to CRE. These strategies are: a) authorisation, in which justifications are made referring to formal or legal authority; b) rationalisation, in which justification is based on rational argument and with reference to the utility of action proposed or taken; c) moral evaluation, which is based on the value systems of protagonists; and d) mythopoesis, which concerns justification offered through the telling of stories, narrative, cautionary tales and so on. To the extent that CREOs are successful in deploying these strategies, they may close the 'legitimacy gap' and in doing so gain resources they need to build their own position while at the same time helping to consolidate the sub-field and bolster the ability of the latter to challenge the prevailing energy mainstream.

In relation to the above, the paper seeks to answer the following research questions:

1) What are the legitimacy gaps that CRE in England has faced (or is facing)?

2) How do CREOs negotiate or try to build organisational and technology legitimacy in relation to formal-regulative, normative and cultural institutional rules relevant to energy generation?

3) What legitimation strategies are employed in arguing for CRE? What social relations are implicated with these discursive processes?

The study is underpinned by the aim to explain the factors influencing the legitimacy-building and legitimation strategies to justify CRE, renewable energy technologies and CREOs, recognising that these may be implicitly 'realised' rather than intentionally pursued [39]. The following section describes in more detail the approach taken to the conduct of the study.

3. Method

Data was collected from personal interviews with 29 respondents, from community renewable energy organisations and related actors, including local authorities, a distribution network operator, representative and support bodies and voluntary organisations, between May 2014-January 2016 (see Table 1 for details). Interviews were typically between 45 and 90 minutes long. Respondents were at the time of their interview active in or pursuing activities relevant to CRE and included project leaders, investors, and support or other organisations (e.g. involved in operating the electricity distribution network). With one exception the interviews were tape recorded and subsequently transcribed.

Table 1. List of interviewees and participating organisations.

Interviewee	Organisations/activities	Length of interview (minutes)
1. Chair and co-founder	Community Interest Company; aims to generate income through RE and other social enterprises making the community carbon neutral	86
2. Chair and founder	Community Interest Company; aims to provide RE to community reducing electricity bills and fuel poverty Registered society; aims to fund and implement RE projects and energy efficiency measures, to cut carbon emissions	109
3. Director	Community Interest Company; aims to help communities/residents live more sustainably; Registered society; aims to develop local RE generation, to encourage energy saving initiatives, to provide support for local communities Registered society; aims to generate RE, to support sustainable community Registered society; aims to establish sustainable renewable technologies, and promotes the efficient use of resources and environmental awareness	97
4. Director	Community Benefit Society; aims to deliver community-owned RE projects, to raise awareness of and promote local low carbon solutions	52
5. Director	Registered society; aims to invest in RE projects, to help local residents to reduce energy use	145*
6. Director	Same as above	145*

7. Director	Registered society; as energy services cooperative aims to decarbonise local electricity generation and build zero-carbon communities Registered society; aims to support the development of RE projects for the benefit of communities/residents	65
8. Community development officer	Registered society; aims to create cooperatively-owned RE projects, to provide training and employment opportunities for local people, to lower energy costs for local residents	44
9. Secretary	Registered society; aims to reduce the carbon footprint of the area through generating RE	49
10. Director/founder	Registered society; aims to bring RE to local community/area	79
11. Chair	Registered society; aims to provide an opportunity for local residents to get involved/ invest in RE	73
12. Chair	Registered society; aims to provide an opportunity for local residents to get involved/ invest in RE	88
13. Chair	Registered society; aims to generate RE, to reduce carbon footprint, to support local community projects	57
14. Volunteer	Registered charity (Community retreat centre); uses RE sources to generate electricity (off-grid)	93
15. Director	Limited company; invested in local RE project to offset the community's carbon footprint; funded by local residents and businesses	49
16. Citizen shareholder	Community Benefit Society; aims to develop RE projects, to support other local energy sustainability projects	42

17. Chief executive	Social enterprise support organization	49*
18. Deputy chief executive	Same as aboveorganization	49*
19. Chief executive	Environment sector company membership organization	34
20. Chief executive	CE membership organisation Registered society; aims to develop and operate RE projects increasing local renewable energy provision	61
21. Business consultant	Planning application support for RE technology	56
22. Sustainability manager	Electricity distribution network operator	56
23. Co-founder	Cooperative providing administrative support to CEOs	101
24. Community services manager	Energy efficiency advice organisation	75
25. Community development manager	Registered charity ; provides support for CRE projects	91*
26. Community hubs manager	Same as above	91*
27. Sustainability manager	Local authority	55
28. Chief Executive Officer	RE company	48
29. Activist/researcher	CE in Scotland	120 (not taped; notes taken)

Note: * more than one informant interviewed jointly

The geographical focus of the study was England, due to differences in policies pursued in the devolved administrations which mean that community renewable energy is subject to various regulatory regimes and approaches across the different nations constituting the UK. The rationale for selecting interviewees was based on the need to choose operational 'community' projects of varying scale, a representative sample of energy generation technologies, a mix of location type (both urban and rural), and of different organisational forms. Figure 1 is a map showing the approximate location of CREOs which took part in the study. 40 installations have been made by or in association with 20 CREOs participating in the study.[2]

Fig. 1. Map of selected community renewable energy groups in England.

Source: www.batchgeo.com

[2] Community Energy England, 2018, identified 197 CREOs and 204 electricity generation installations in England [18].

Six different renewable energy technologies were represented, though solar photovoltaics predominates with 75% of the installations, approximating its share of Feed-in-Tariff supported initiatives (see Figure 2, below).

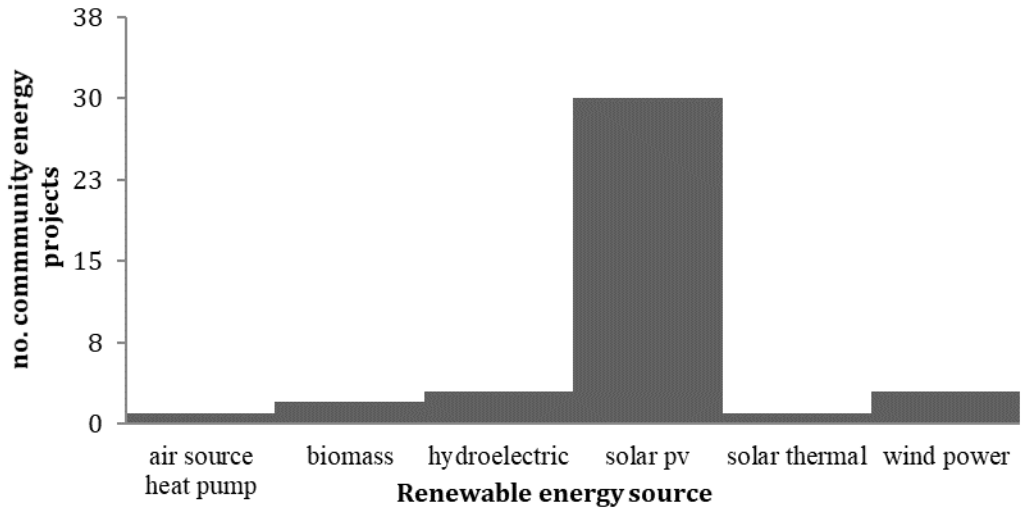

Fig. 2. Distribution of renewable energy technologies installed in selected community projects in England.

Initially, the research team searched a DECC database to identify individual renewable energy sites in England . Secondly, the researchers searched the database of the Community Sustainable Energy Programme, an initiative which provided capital grant funding for not-for-profit community based organisations in England for the installation of microgeneration technologies, as well as project development grants. Thirdly, the team approached members of the Community Energy Contact Group, which had regular meetings with DECC. Finally, potential respondents were recruited through 'snowballing', via interviewees' personal networks and at community energy events (e.g. the Community Energy Conference 2015).

The transcribed interviews were analysed using NVivo 10 qualitative data analysis software. As well as the text of interviews, the analysis of legitimation discourses was based on publicly available texts

produced by their organisations (e.g. reports, websites), to identify regularities in arguments for and typical representations of CRE/CREOs.[3]

Quotations from interviewees are selected for their capacity to illustrate the points made regarding problems of legitimacy and legitimation in relation to CRE, and/or for their representativeness in relation to respondents' view of particular phenomena.

4. Findings

This section presents findings from the study, in relation to the nature of the technology and organisational legitimacy gaps faced by CRE/CREOs in England, and legitimacy-building and legitimation strategies employed.

4.1 Legitimacy gaps

The findings suggest that particular CREOs and CRE more broadly have had to address a number of challenges in an ongoing struggle for legitimacy. Often, CREOs have the enthusiasm and determination to deal with those challenges, although several projects discussed by interviewees were abandoned, e.g. at the stage of seeking a planning permission or raising finance. These challenges are symptomatic of the technology and organisational legitimacy gaps which have needed – and in many cases still need - to be closed if greater institutionalisation of CRE is to be achieved. In summary, interview respondents commonly reported that these challenges are associated with: changing or inconsistent state policy and reduction of support available through the Feed-in Tariff mechanism; planning permissions and consents; eliciting stakeholder engagement (including local communities); financing; relationship-building with partners; access to expertise; environmental issues; technology-related issues, including installation and grid connection; resources availability and scale; and time constraints. At the root of these challenges are gaps in organisational legitimacy and technology legitimacy, which are outlined below.

[3] For example, the website of Community Energy England https://communityenergyengland.org/

4.1.1 Gaps in organisational legitimacy

The findings identify gaps in organisational legitimacy, which may be distinguished in relation to pragmatic, normative and cognitive dimensions thereof. For example, in relation to the pragmatic dimension the analysis shows that the credibility of CREOs and perceptions of their ability to serve the interests of policy-makers on a continuing basis have not been high enough to engender policies that have been consistently favourable to them.

The following points may be made (recognising consequential, procedural and structural aspects) regarding the normative dimension of organisational legitimacy. In connection with the consequential aspect, interviewees expressed what they felt was UK governments' wavering confidence in CRE to contribute effectively to the achievement of climate change and energy policy goals. One may distinguish those who see CRE as democratic, local ownership of generation and as a means of societal transformation, and proponents (e.g. the state) of partnerships among established actors and CREOs. Each of these may appear as 'the right thing' to do for society, whether that is expressed in terms of market development, security of energy supply, decarbonising the economy or community building.

In terms of the procedural aspect, the findings attest to the pressures on CREOs to conform to expected ways of working and organising. Those with whom CREOs engage (e.g. funders, installers, developers) have certain norms, which CREOs may not share, about what and how things should get done, i.e. employing professional practices and procedures. A similar point applies regarding the proper structure for organisations (the structural aspect). CREOs, reliant on a few volunteers, often lack the knowledge or required routines and skills (e.g. to do due diligence), or are short of the personnel (e.g. finance or legal qualified staff) to appear credible to these external audiences – and sometimes their own. Thus, CREOs might fail to acquire or lose legitimacy with those in influential positions who could ease access to resources.

The cognitive dimension of organisational legitimacy is manifest in commonly held assumptions which de-legitimise CREOs taking it for granted that they are considered, as interviewees say: risky

(environmentally or financially); amateurish; too small to be effective; exclusive (e.g. dominated by middle class people); and have unfamiliar business models.

4.1.2 Gaps in technology legitimacy

The interviews show a mixed and changeable picture regarding gaps in technology legitimacy, with variations over time and between different RE technologies. After a period of state support welcomed by proponents of CRE, recent years have seen substantial reductions (notably in the Feed-in Tariff), as macro-economic conditions have worsened. In terms of the pragmatic dimension of technology legitimacy, supporting onshore wind power is not seen as a vote winner for the Conservative Party that has been in government since 2010, whether with an overall majority or in coalition. Nor does state support for the more costly technologies fit the short and medium term 'austerity' economic policies of recent Conservative administrations. The changing dynamics around RE technologies choices were acknowledged by interviewees who pointed to the change in technology preferences for CRE projects, observing that: '[N]ow wind is seen as the most undesirable due to public objections and costs (CEO of National Representative Membership Organisation). Moreover, there is marked opposition (especially to onshore wind turbine installation) from certain local authorities, which have denied planning permission to CRE projects, local citizens and even other green groups.

Fundamentally, the normative dimension of the technology legitimacy gap relates to a widely held view that energy generation, including that using community renewable energy technologies, needs to feed a centralised grid. This is a view about the 'rightness' of energy system design. Moreover, doubts are raised concerning the intermittency, variability and storage of power supplied, which are not shared by many advocates of CRE. The extent to which CRE is not taken-for-granted as a way to generate electricity or supply heat fundamentally exemplifies the gap in the cognitive dimension of technology legitimacy. The continued reliance on fossil fuels and non-renewable nuclear power for energy supplied and final consumption attests to the institutionalisation of these energy technologies.

4.2 Legitimacy-building

CRE has sought to build legitimacy through the establishment of recognised nationally representative bodies and a hub for peer-to-peer networking and knowledge exchange. In parallel, a number of awards for community energy has been founded. Further, representative bodies (e.g. Community Energy England) lobby government to shape policies which might be favourable to CRE, whilst offering facilities (an online 'hub' and annual conference) through which members can meet, share knowledge and promote the activities and achievements of the sub-field. Exploring legitimacy building of individual CREOs/projects and the sub-field helps to understand better what constitutes CRE in England and the complexity of the phenomenon. The focus on legitimation of individual CREOs and CRE projects also allows a closer look at materiality as a basis for legitimacy.

In practice, CRE projects are techno-organisational assemblages. Achieving legitimacy for CRE therefore means building both organisational and technology legitimacy. In terms of organisational legitimacy, the key elements identified are the choice of a legal form/business model by CREOs, to satisfy legislative, regulatory and funding requirements, and the building of partnerships to secure local support or acquire knowledge and expertise for the project or CREO. Building technology legitimacy concerns decisions about what RE technologies to invest in and alignment with other aspects of the energy system.

4.2.1 Building organisational legitimacy

Findings pertaining to how CREOs build organisational legitimacy are presented in relation to four types of CRE model, identified according to whether: a) the promoter of an initiative is primarily internal or external to the focal CREO; and b) the motivation underlying an initiative is mainly activist or entrepreneurial. The four types of CRE model arising from this classification are thus: internal activist; internal entrepreneurial; external activist; and external entrepreneurial.

Internal activist CRE emphasises community ownership and participation. Here, CREOs build legitimacy in the pragmatic sense by working with a target segment (e.g. the fuel poor) or community

of place to address their needs. In the internal entrepreneurial model, CREOs adopt the investment club model familiar from other sectors, which may be legitimate procedurally or structurally. In external activist CRE, CREOs conform to a partnership model, in which the focal local organisation gets support from often larger, more experienced organisations with generally sympathetic values or other interested intermediaries such as local authorities or universities. This may enable the CREO to address the interests of local residents and activists while gaining legitimacy with state authorities in relation to organisational processes and structure. Finally, in external entrepreneurial CRE, CREOs adopt another version of the partnership model endorsed by the state, in which the project is instigated or led by an 'anchor' partner, e.g. a commercial developer.

The most obvious example that illustrate such partnership is the external activist 'Energy4All' model, in which both Energy4All and its member community co-operatives have a history rooted in community energy activism. Energy4All Ltd was created in 2002 by members of the Baywind mutual community energy cooperative. It is owned by the community energy cooperatives it assists, which mid-2017 comprised 15 in England and a total of 22 in the UK as a whole. This model can help small local community organisations to compensate for deficiencies in procedural and structural legitimacy, as exemplified by the following quotation from a representative from one of the community organisations: "Once the project was established […] Energy4All then became the administrators, the management team …who delivered the project. We couldn't exist without them… We're just totally reliant on them for the management of the wind farm." (QJ – Chair of Community Energy Organisation, East Anglia)

The external entrepreneurial business model, based on CREOs working with companies/commercial developers of RE projects, is favoured by the government, and can mean simply buying into projects that are already being developed. This approach makes the process of setting up a project much easier for CREOs. "The last government encouraged developers to share their projects with communities, and what a number of groups are doing is buying a portion, for example, of a solar farm" (LG, Director, Northern Community Energy Organisation).

Organisational legitimacy-building also inheres in the choice of legal forms by CREOs; 14 groups in the study use a co-operative business model and are 'registered societies' in relation to the 2014 Act, which were previously designated as industrial and provident societies (IPS), and two are societies for 'community benefit' (or 'ben com'). Three organisations in the study maintained the status of a 'community interest company' ('CIC') at the time of being interviewed, though one was dissolved in November 2015; only one was set up as a private limited company All of these are legal forms, some devised specifically with social enterprises in mind and thus enjoy legitimacy with state authorities. Depending on the form they may been seen as legitimate by communities they serve (CICs and ben coms) or members (cooperative societies or IPS).

The interview material shows that developing relationships with and mobilising the support of residents, communities and other audiences is important for different types and dimensions of legitimacy. For example, in relation to building the pragmatic dimension of organisational legitimacy, a dialogue with potentially affected groups/stakeholders (e.g. a fishing community and a boat hire company for a hydro scheme) can mean 'quite a lot of liaison work', even if the local community is supportive in general.

Relations with partners, e.g. installers of RE technologies, also vary, depending on whether the firms coming from a commercial environment are familiar with the community energy model and share similar values. The uncertainty regarding finance for CRE projects, which is common at the early stages of development, means that it is preferable for CREOs to deal with big and mature businesses which can accommodate some flexibility in terms of timescale and technology capacity needed. Interviewees also pointed to the role of financial institutions, which were reluctant to lend to CREOs. As one respondent said: "the project really struggled to take off in the early days because simply the banks wouldn't underwrite it". (QJ – Chair of Community Energy Organisation, East Anglia).

4.2.2 Technology legitimacy-building

The interview material highlights the adoption of a technology legitimacy-building strategy based on the selection of a favourable environment, as exemplified in the choices of RE technology in which to invest. Solar is praised by interviewees from CREOs as 'fantastic' and 'the best technology' as it is

seen as less controversial (compared e.g. with the disapproval of significant sections of the general public of onshore wind). It is also generally considered by interviewees to be easier to achieve from a financial or regulatory point of view, in contrast with the price of a wind turbine or a hydro-electric scheme. However, interviewees also recognise some problems with solar PV. For example: installations take land space (in the case of ground mounted solar); existing infrastructure i.e. roofs may not be suitable for installations (of rooftop solar). Onshore wind remains attractive to CREOs (if not in urban locations): they see that output is higher in the winter when energy is in greater demand; the technology works at night; and the amount of land needed is relatively small. Hydro schemes are favoured due to the support of local citizens, although dealing with the planning system and additional consents (in relation to fisheries and requirements of the Environment Agency) can take a long time.

One of the crucial elements of technology legitimacy for RE (beyond its ability to actually generate power, be financially viable and gain public/local support) is the ability to connect the supply with consumption/demand, turn energy into a good, making profits for stakeholders. The planning process for CRE projects does involve considerations about the grid connection and electricity distribution networks. It is widely admitted that the complexity of grid connection is often underestimated by the community organisations at the early stages of their projects. Technology legitimacy of CRE projects therefore typically depends on their compatibility with existing energy distribution infrastructure, which might be 'dated' and lacking capacity.

The diversity of CRE projects (scale, location, type of technology) implies variations in terms of energy distribution and grid connection. The study identified three models being pursued:

(i) 'Embedded generation'/Compatibility model means that CRE projects are connected to the National Grid or the local distribution grid in which case electricity is used locally. Although the approach seems simple and straightforward, some compatibility issues arise in relation to capacity in the local grid which can put restrictions on the size of the RE project. As stated by one interviewee: 'we applied to put 2.7 megawatts in, the grid came back and said there's only enough capacity for 2 megawatts.' (BY, Chair, Community Energy Cooperative, South).

(ii) Semi-isolation model allows energy use by the community first before selling surplus to the National Grid (but requires a private Grid if not attached to residential houses). In this case, the company (e.g. a hydro company or a solar company) sell electricity to local residents or organisations, usually on a lower price, before selling the excess electricity to the National Grid.

(iii) Off-Grid/isolation model is based on the idea of 'energy sovereignty' which also can include a local micro grid. In our study this model suited communities that are remote from the nearest Grid supply of electricity. This approach is seen by its proponents as more ecological and sustainable, although the choice may be based on more practical considerations, as it helps avoid extra costs associated with Grid connection and in some cases a private sub-station.

Justification and legitimation of technology choices and related solutions (e.g. grid connection) are central to CREOs' ability to deliver a project in which electricity generation artefacts are core elements. Although challenges and controversies surrounding RE technologies are not faced exclusively by community organisations, legitimation of technology choices here is enmeshed with organisational aspects of CRE, some of which pertain to the ownership model and funding of CREOs.

4.3 Discursive legitimation strategies

The discursive strategies employed by CRE/CREOs address both organisational and technology issues pertaining to legitimacy building for CRE. Such strategies are deployed to counter widespread unfavourable narratives of CRE, to advance the case for CRE. All four types of legitimation strategy outlined above are employed: authorisation (an appeal to state authority e.g. government support for certain types of RE, legal forms sanctioned by the state and adopted by CREOs); rationalisation (e.g. justification of the choice of RE technologies and more broadly for CRE; justifications of different business models based on different understanding of the idea of 'community'); moral evaluation (CRE as a 'good' thing; CRE as bringing benefits for local communities; growth of a cooperative movement; educational benefits); mythopoesis (stories of struggle, resilience and success, often used to counter opposition to CRE). These strategies are employed by individual CREOs and CRE collectively, and are reflected in discourses, which often overlap and echo each other.

However, the discourses differ in their focus and scope, as they address different stakeholders as key audiences. For CREOs the range of stakeholders can be very wide but the principal audiences are local residents/communities and members of CREOs, local authorities, and financial bodies. This brings to the forefront the organisational and technology-related issues (most controversial), which are specific for particular organisations and CRE projects. It seems problematic for individual CREOs to deal with the lack of political support for CRE (although we have examples of some activists approaching the government departments, as well as taking part in consultations launched by the government); this legitimacy gap can be dealt with effectively only through collective action.

Both narrow and less restrictive images of the CRE sub-field identify CREOs as its core. However, CRE legitimacy cannot be seen simply as aggregative of legitimacy of individual organisations, although legitimacy-building for individual organisations and projects inevitably has an effect on the growing legitimacy of the sub-field as a whole. For the CRE community in England, the image of CRE goes beyond producing electricity from renewable sources; it involves other benefits such as helping people in fuel poverty, providing reduced price electricity to schools, bringing improvements to community buildings, improving wildlife areas, attracting private investments etc. The legitimation discourse is based on rationalisations in which increasing deployment of CRE represents a positive and desirable path. Community energy is argued to have significant potential whilst still being vulnerable, immature and dependent, requiring continued 'nourishing'.

The discourses generated in the sub-field can be seen as attempts to reinforce institutionalisation of CRE. Legitimation of CRE is framed as highly dependent on state authorisation, i.e. government support and a dialogue with policy makers, as well as on inner unity and peer-to-peer support. This means that the key audiences for the legitimation discourses circulating in the sub-field are the state and individual CREOs (existing and prospective). This suggests the thematic organisation and characteristics of those discourses, which deliberate the idea of solidarity, unity, sense of community. The most prominent and powerful discourses are being shaped by CRE representative bodies and other collective forums (e.g. CRE conferences). For them, the government is a key stakeholder who they challenge the most.

The discourse frames CRE and CREOs as disadvantaged compared with mainstream commercial developers, and as dependent on subsidies. Moreover, it also says much about power relations within the discourse, in particular about capacity and ability of representative organisations and CREOs to influence institutional change. The vision of the sub-field as struggling to lobby their interests or influence government's decisions dominates; depowering community energy also raises questions about the relations with the state, to what extent the government policy is susceptible to change, and whether opportunities to influence government decisions for a non-mainstream sub-field (e.g. through consultation mechanisms) are 'real'.

5. Discussion

The paper supports the argument made by Suchman (1995) that key audiences may withhold support from focal organisations, causing the latter to fail to acquire or lose legitimacy with those in influential positions who could ease access to resources [7]. Here, findings were presented in the context of CRE, an empirical domain which has barely featured in research on legitimacy and the transformation of entrenched institutions. The support needed from audiences which could help to realise the transformational potential of CRE is withheld for several reasons. These are connected with doubts about the capacity of CREOs and related technologies to satisfy the interests of key constituencies (implicated with pragmatic dimension of both technology and organisational legitimacy), concerns about CREOs' organisational processes i.e. whether their procedures are fit for purpose and in line with what is expected to 'get the job done' (the procedural aspect of the normative dimension of organisational legitimacy), and reservations about their organisational form (the structural aspect of the normative dimension of organisational legitimacy). Another way of looking at things is to recognise the continued legitimacy of conventional energy business models, modes of organisation or actors (including local authorities). Even where these have been questioned, this does not mean that CRE has the legitimacy necessary to step immediately into the breech, not being the universally taken-for granted alternative (i.e. lacking in the cognitive dimension of technology legitimacy). A distinction needs to be made between possible de-institutionalisation of high carbon energy and institutionalisation of (C)RE, CREOs and associated renewable energy technologies.

The question of how CREOs negotiate or try to shape institutions, may be addressed in relation to the strategies employed to build different though interpenetrated types of legitimacy. Acting collectively, CREOs lobby regulatory bodies, who are actors in the community (renewable) energy sub-field but also have an important role to play within the mainstream energy field dominated by multinational oil and gas companies and central distribution of electricity. The 'field struggles' involve issues pertaining to the level of state support for small scale renewable energy schemes (e.g. via the Feed-in tariff mechanism) and the registration of CREOs as co-operative societies, for example. CREOs thus set up and contribute to national representative bodies in order collectively to inform or lobby policy-makers. Following Markard et al. [6], there was until recently a temporary though partial alignment between CRE/CRE technologies and what was valued by the state and wider society.

A partnering approach was suggested by the UK Department for Energy and Climate Change in its community energy strategy [15]. Conformity with this approach conferred advantages to those adopting the model in the sense of gaining legitimacy with the state but arguably with some versions of the model this comes at the expense of 'toning down' unconventional models (c.f. [29]; [40]). The more radical individual initiatives have not been able to institutionalise their preferred logic within the sub-field; they tend to lack the financial and organisational resources, and supportive networks of those operating in the partnership or more 'energy entrepreneurial' business models (c.f. [14]; [41]; [42]). In any case this mode goes against the grain of highly local grassroots community energy, premised on rather different visions of energy citizenship and democracy, entailing societal, not merely 'energy system' transition.

There are two distinct groups which contest the legitimacy of CRE: (1) actors embedded in the CRE sub-field, for whom CRE is the primary activity (CREOs and activists, support organisations and networks); and (2) 'external' actors associated with CRE (government, local authorities, network operators, businesses e.g. contractors). External and embedded actors have different views of the legitimacy of CRE; there is a struggle over it, inherent in the language strategies of CRE discourse. For embedded actors, the value of CRE is unquestionable; it diversifies energy supply, contributes to renewable energy generation targets and builds resilience of the energy system and local communities.

For the state and other audiences – a simplified, standardised approach is preferred, with CRE to be complementary with other socio-technical arrangements, e.g. around energy in case of energy policy, around business models in case of business relations and contracting, around local infrastructure, communities and public acceptance for local authorities etc. Moreover, for the state, energy is seen as a strategic resource that needs to be governed centrally. Thus, the state may not be interested in CRE growth that would mean more diversified, dispersed, and perhaps uneven and less controllable energy supply.

The struggle over the legitimacy of CRE can be explained through the prism of alignment/misalignment with existing institutional structures and institutional conflicts. CRE initiatives align well with certain institutions and material infrastructures which translate similar meanings and values (e.g. of 'community', 'community ownership', 'sustainability', 'sustainable energy'), e.g. an alignment with existing village infrastructure (using a wind turbine to generate power for the community building) as they both translate the idea of community. However, there is misalignment with well-established institutions (e.g. reliance upon a centralised grid and nationwide electricity networks, certain financial and legal rules and infrastructural requirements for some RE technologies), posing particular challenges for activist-driven CRE/CREOs. This suggests the need for a flexible and adaptive approach if institutionalisation of CRE in existing institutional settings is to be achieved.

6. Conclusion

The paper aimed to answer research questions pertaining to the technology and organisational legitimacy and institutionalisation of potentially system transforming community renewable energy (CRE), CRE technologies and organisations (CREOs) in the case of England. It sought to identify and analyse: legitimacy gaps facing CRE, CREOs and CRE technologies; and the legitimacy-building and discursive strategies employed.

A core issue concerns how 'niche' CRE can challenge orthodoxies [1] to transform the energy system. Although CRE benefited from state support for a decade up to 2015, more recently this (i.e. Feed-in tariffs) has been substantially reduced. The paper highlights gaps in organisational and technology

legitimacy that have contributed to the situation, including organisational issues to do with lack of confidence in CRE/CREOs and technical ones, such as grid connection and installation. The paper concludes that a perspective that analyses both technology legitimacy and organisational legitimacy has greater capacity to interrogate effectively the institutionalisation of CRE than the adoption of either approach alone.

The paper notes the prevalence of and congruence with state preferences of 'externally entrepreneurial' legitimacy-building strategies involving partnership with actors who may not be pre-disposed towards CRE, or who have resources and expertise but weak commitment to more radical CRE. It notes too that some local 'internal activist' grassroots initiatives prefer to operate in already favourable environments, though may join a network of sympathetic partners to address perceived or actual organisational deficiencies (c.f. the Energy4All model). The paper develops Bolton and Hannon's [14] insights regarding business models and change in socio-technical systems. Here, the co-evolution of business models and RE policy effectively incorporates CRE into an energy system designed for centralised generation by large utilities.

CRE proponents employ various discursive strategies to build coalitions and win support and counter arguments that CRE technologies and organisations are ineffective, poorly organised or harmful to the environment. Taken-for-granted 'cognitive' legitimacy of CRE (at least for some technologies, such as onshore wind) eludes influential state and local actors, affecting the *quality* – if not quantity or speed – of overall RE diffusion. Further research is required to identify how CREOs might more effectively argue their case for support, particularly where this involves currently less favoured energy technologies or business models. Studies may also provide examples of effective organisational practice on which future discursive strategies can be anchored. Whilst the current study is limited in its focus on phenomena in one country, it advances the understanding of institutionalisation, legitimacy- and coalition-building in distributed energy/CRE . It is hoped that future work will further extend geographical coverage, to provide a more contextually sensitive understanding of institutionalisation and legitimacy of CRE and their implication with energy system transition.

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