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1 **Community Energy: entanglements of community, state and private sector**

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4 5 **Abstract**

6 The decarbonisation of energy systems is leading to a reconfiguration of the geographies of
7 energy. One example is the emergence of community energy, which has become a popular
8 object of study for geographers. Although widely acknowledged to be a contested, capacious
9 and flexible term, 'community energy' is commonly presented as singular, bounded and
10 localised. In this paper, we challenge this conception of community energy by considering
11 evidence about the role and influence of three categories of actors: community; state; and
12 private sector. We demonstrate how community energy projects are unavoidably entangled
13 with a diversity of actors and institutions operating at and across multiple scales. We
14 therefore argue that community energy is enabled and constituted by trans-scalar
15 assemblages of overlapping actors, which demands multi-sectoral participation and
16 coordination. We point to the need for further academic attention on the boundaries between
17 these actors to better understand the role of different intermediary practices and
18 relationships in facilitating the development of decentralised energy systems with just
19 outcomes.

20

21 **Keywords**

22 Community energy; decentralised energy; energy transition; energy geographies; energy
23 governance.

24

25 **1. INTRODUCTION**

26 Academic interest in community energy has been increasing for a decade. Early research
27 focused primarily on understanding meanings of and attitudes towards community energy
28 (e.g. Walker, Hunter, Devine-Wright, Evans & Fay, 2007; Walker & Devine-Wright 2008;
29 Rogers, Simmons, Convery & Weatherall, 2008; Warren & McFayden, 2010), as well as
30 exploring motivations for and barriers to participation (e.g. Walker, 2008; Hoffman & High-

31 Pippert, 2010; Bomberg & McEwen, 2012) and the potential for community initiatives to
32 contribute to system-wide change (e.g. Hoffman & High-Pippert, 2005; Hielscher, Seyfang &
33 Smith, 2011; Seyfang & Haxeltine, 2012). While these questions continue to have resonance
34 today (e.g. Hicks and Ison, 2018; Becker, Kunze & Vancea, 2017), there has also been
35 growing interest in the socio-political dimensions of community energy, most explicitly
36 expressed through concepts of justice and democracy (e.g. Catney et al, 2014; McHarg,
37 2016; Simcock, 2016; Forman, 2017; Angel, 2017; van Veelen, 2018). This expanding body
38 of community energy scholarship is international and interdisciplinary, with particular interest
39 in Europe (e.g. Becker & Kunze 2014; Blanchet 2015; Bauwens, Gotchev & Holstenkamp
40 2016; Hall, Foxon & Bolton 2016; Islar & Busch 2016), especially the UK (e.g. Walker and
41 Devine-Wright 2008; Middlemiss & Parrish 2010; Bomberg & McEwen 2012; Seyfang,
42 Hielscher, Hargreaves, Martiskainen & Smith, 2014; Strachan, Cowell, Ellis, Sherry-Brennan
43 & Toke, 2015; Simcock 2016; Markantoni 2016; van Veelen 2017). Much of this attention
44 has come from geographers interested in community energy as a manifestation of “new
45 ways – and new geographies – of producing, living, and working with energy” (Bridge,
46 Bouzarovski, Bradshaw, & Eyre, 2013, p. 331) developing in response to the need to
47 transition to low carbon economies (OECD, 2015).

48 A range of terminologies has emerged in different contexts to refer to various forms of locally
49 led, collectively owned and managed energy projects, including: civic energy (de Vries,
50 Boon, & Peine 2016; Hall et al 2016); citizen energy (Yildiz, 2014); grassroots energy
51 (Blanchet, 2015; Haggett & Aitken, 2015; Kooij et al, 2018); local energy (Arentsen &
52 Bellekom, 2014; Hoppe, Graf, Warbroek, Lammers & Lepping, 2015; Schwencke, 2017;
53 Hasanov and Zuidema, 2018); and ‘collective and politically-motivated energy’ (Becker &
54 Kunze, 2014). Nevertheless, in the UK, ‘community energy’ is the most prevalent term used
55 in both policy and practice, and it has become the dominant term within the international
56 academic literature (Kunze & Becker, 2015; Seyfang et al, 2014). The explicit connection
57 between ‘energy’ and ‘community’ may particularly attract geographers to the concept of

58 community energy by focusing attention on the influence modes of energy production and
59 distribution have on acts of place-making, and the ways spatial identities affect processes
60 and criteria through which the legitimacy of staking a claim in, or profiting from, a specific
61 energy project is negotiated (Calvert, 2016; Cowell, Bristow, & Munday, 2011; Murphy &
62 Smith, 2013).

63 Despite the development of community energy as a distinct research object, 'community
64 energy' continues to be used ambiguously and flexibly both in practice and literature (Becker
65 & Kunze 2014; Klein and Coffey 2016). Energy can be decentralised in many ways, and
66 community energy encompasses projects of varying scale, complexity and socio-technical
67 organisation, embedded within diverse social contexts (Pohlmann 2018; Chmutina &
68 Goodier, 2014; van Veelen, 2017). Projects vary significantly according to the parts of the
69 energy system they seek to influence, with different activities addressing how energy is
70 *generated*, how it is it is moved around (*transmission* and *distribution*), and how it is sold
71 (*supply*) to end users (*demand* for energy). Governance and ownership models also vary.
72 Differences in how projects are controlled, owned and financed translate into differences in
73 civic actors' roles, and the degrees of risk, return, and responsibility for communities of
74 community energy (Haggett, Creamer, Harnmeijer, Parsons, & Bomberg, 2013). Moreover,
75 community energy is not the product of community endeavours alone. Community energy is
76 enabled and constituted by trans-scalar assemblages of overlapping and heterogeneously-
77 configured actors.

78 This article therefore aims to challenge framings of 'community energy' as singular, bounded
79 and localised by exploring the role and influence of three categories of actor in 'community
80 energy': state; private sector; and community. Whilst we address these actors separately for
81 clarity, we take them as overlapping, non-unitary and contested domains. We highlight the
82 differences in needs, constraints and ambitions of these different actors and argue that, to
83 date, insufficient attention has been paid to the fuzzy but productive boundaries between
84 them.

85 This is not a systematic review of community energy literature. Instead, we draw on literature
86 selectively to enable us to examine these different actors and highlight the interplays
87 between them. We focus on the UK, because it bounds the review to a specific
88 sociotechnical energy system configuration, and because a large proportion of the
89 community energy scholarship has been conducted within the UK. Whilst we draw on
90 selected European, North American and Australian scholarship comparatively to illuminate
91 specific resonances and contrasts with the UK case, we have excluded literature on
92 decentralised energy in developing countries. Although we recognise the value in
93 incorporating this perspective, significant differences in sociotechnical infrastructure systems
94 and socio-political-economic and historical contexts adds a complexity that puts this beyond
95 the scope of this paper.

96 We take each actor category in turn, considering evidence of the ways they constitute and
97 configure community energy projects, and factors influencing this role. We then bring these
98 observations together to reflect on how framing community energy as a product of
99 entanglements between these different actors helps to expose the role of intermediary
100 practices in the development of decentralised energy systems and the need for more
101 nuanced understanding of processes through which more democratic and inclusive
102 outcomes are achieved through community energy.

103 **2. THE COMMUNITY**

104 Communities are engaged in a broad range of energy activities, including electricity and heat
105 generation (from a range of sources), energy efficiency and demand management, collective
106 purchasing, storage, transport, and education and awareness raising¹. Community energy is
107 commonly differentiated from non-community energy by the (assumed) level of participation
108 and involvement of community members in the process of developing a project and/or the

¹ For examples of successful community energy projects in the UK see <https://communityenergyengland.org/pages/case-studies> (England) and <http://www.communityenergyscotland.org.uk/case-studies.asp> (Scotland)

109 outcomes of the project (van Veelen, 2017). Although some (e.g. Walker & Devine-Wright,
110 2008) use this 'process-outcome' approach to map the broad variety of community projects
111 that may exist, others adopt a normative perspective, where 'more' (participation or benefits
112 flowing into the community) is better (e.g. Callaghan & Williams, 2014). This is one
113 explanation for the substantial body of empirical research on community energy focusing on
114 understanding factors that encourage and facilitate participation in energy projects (e.g.
115 Bomberg & McEwen, 2012; Park, 2012; Rogers, Simmons, Convery, & Weatherall, 2012a;
116 Walker, 2008). Across this literature, scholars have particularly noted the importance of
117 identification with a place-based community in facilitating participation: a sense of belonging
118 to a particular place is observed to inspire voluntary efforts to develop community renewable
119 energy to generate local benefits (Bomberg & McEwen, 2012; Haggett & Aitken, 2015;
120 Rogers, Simmons, Convery, & Weatherall, 2012b; van Veelen & Haggett, 2016). This sense
121 of belonging and place attachment has been observed to be mutually reinforced through
122 participation in community projects (Haf & Parkhill, 2017; Hoffman & High-Pippert, 2010;
123 Kalkbrenner & Roosen, 2016; van der Horst, 2008). For example, Haf and Parkhill (2017)
124 found that the four community energy projects they studied in Scotland and Wales were
125 driven by cultural values, but also contributed to the cultural sustainability of local areas
126 through encouraging retention of Scottish Gaelic and Welsh languages.

127 Community is not necessarily place-based, and various legal structures are used to
128 constitute different types of community groups. A group's legal structure – as well as its
129 activities – can influence the potential impact of the project and inform interactions with
130 society at multiple scales, including the degree and form of local participation (Devine-Wright
131 & Wiersma, 2013). Some models of community energy rely on engaging a large number of
132 residents in the local geographic community, whereas others depend more or less actively
133 involved financial investors (Kalkbrenner & Roosen, 2016). In the UK, groups can adopt the
134 structure of a Community Benefit Society, Community Interest Company, Co-operative
135 society, Limited Company or other charitable legal models. Community Benefit Societies

136 serve the interests of their local community, whereas Co-operatives serve the interests of
137 their members, who can be geographically dispersed (van Veelen, 2017).

138 Despite, or perhaps because of, the fact that 'community' is embedded within community
139 energy, what constitutes community in community energy has arguably been taken for
140 granted or inadequately unpacked in much of the literature (Devine-Wright & Wiersma,
141 2013). 'Community' commonly invokes feelings of "warmth, belonging, and comfort" (Evans,
142 2010: 33). As a result, there is a tendency to make normative assumptions about the
143 inherent moral and ethical 'goodness' of community energy (Taylor Aiken, 2014; 2015).
144 Community energy has been assigned a central role in new literatures on energy democracy
145 and justice (Catney et al, 2014; McHarg 2016; Simcock 2016; Forman 2017; Angel 2017;
146 van Veelen, 2018) and is associated with helping to give voice to those disenfranchised by
147 existing energy system configurations (Wirth, 2014). It is argued that, through community
148 participation, decisions around energy are more inclusive, decision-makers are more
149 representative, and there is greater opportunity to hold decision-makers to account (Kunze &
150 Becker, 2015; Vansintjan, 2015; Weinrub & Giancattarino, 2015).

151 The capaciousness of the term 'community energy' can be valuable for communities. It
152 enables experimentation with different models (Walker & Devine-Wright, 2008) and allows
153 for a wide range of practices to emerge, dependent on, and sensitive to, particular contexts
154 (Becker & Kunze, 2014; Pohlmann, 2018). In her study of three community energy projects
155 in Scotland and Germany, Pohlmann observed that a multitude of different interests, ideas,
156 knowledge, and norms shaped the projects. For one project, energy production was used as
157 a way to generate money to realise the community's broader interests. For another, the
158 project was used to directly challenge the existing energy system. For the third, the project
159 was a means to raise international attention for the city and become a symbol for the
160 production of renewable energies in the district. In each case, the communities were able to
161 'make sense of' community energy in a way met their particular needs.

162 There is a growing strand of critical research on community energy highlighting that simply
163 adding the prefix 'community' does not necessarily lead to just or democratic outcomes.
164 Community energy does not, in itself, generate progressive or regressive effects; it is the
165 way that it is mobilised and enacted that matters (Berka & Creamer, 2018). It has been
166 observed that, typically, only a relatively small number of highly active community members
167 are necessary to initiate and manage a community energy project (Hoffman and High-
168 Pippert, 2010). Fostering and sustaining participation in community energy projects has
169 been found to be challenging, particularly given the apparent pervasiveness of individualism
170 in everyday social interactions (Mulugetta, Jackson, & van der Horst, 2010). Kalkbrenner
171 and Roosen (2016) note that low willingness to participate in local energy projects is partly
172 due to "free-riding" as "positive outcomes, such as environmental benefits, are distributed
173 amongst participants as well as non-participants" (p.61). As Hoffman and High-Pippert
174 (2010) suggest, sustained participation is therefore likely to be motivated less by personal
175 benefit than by an appreciation of community-wide benefits.

176 Community energy is commonly assumed to deliver a range of positive social outcomes
177 locally (Bere, Jones, Jones, & Munday, 2017; Callaghan & Williams, 2014; Gubbins, 2010;
178 Hicks & Ison, 2011; Seyfang, Park, & Smith, 2013), and there is evidence to suggest that
179 economic and social outcomes are at least as important as environmental concerns in
180 motivating community energy projects (DECC 2014a; Haggett, et al., 2013; Hargreaves,
181 Hielscher, Seyfang & Smith, 2013; Islar & Busch, 2016). However, in a recent systematic
182 review, Berka and Creamer (2018) found little robust empirical evidence of social benefits
183 being generated in practice.² Moreover, participation is not guaranteed to be a positive
184 experience with a positive outcome for all (Callaghan & Williams, 2014; Middlemiss &
185 Parrish, 2010); nor is it automatically equitable. As Park (2012) and Catney et al. (2014)
186 have demonstrated, varying levels of community capacity and social capital within

² Several community energy organisations are currently collaborating to design a standardised 'monitoring and evaluation tool' aimed at producing such evidence. See <https://www.pureleapfrog.org/monitoring-and-evaluation> for more details.

187 communities may support or greatly inhibit local energy action on the ground, with
188 participatory opportunities often taken up by those in higher socio-economic groups
189 (Grossmann & Creamer, 2017; Angel, 2017). Consequently, there are fears that community
190 energy is more accessible to affluent and able communities - or individuals within those
191 communities - reflecting wider political issues concerning the role of social class, socio-
192 economic division and regional and spatial inequalities that underpin broader systemic
193 inequalities in the UK (Catney et al., 2014; Johnson & Hall, 2014; Park, 2012). Here, the role
194 and influence of the community meets, and becomes entangled with, the role of the state.

195 **3. THE STATE**

196 3.1 Central government

197 The actions of central government institutions are critical to the development of community
198 energy projects. State funding and subsidy mechanisms, planning regimes, political
199 commitment to low carbon energy transitions and arrangements for devolved decision-
200 making all have-significant influence (Walker, 2008). Less visibly, policy measures are both
201 shaped by and serve to reproduce culturally-specific social norms, understandings and
202 priorities, with direct and indirect consequences for the acceptance and normalisation of
203 community energy (Bomberg & McEwen, 2012; Taylor Aiken, 2014).

204 In the UK, the roots of the community energy policy under the 1997-2010 Labour
205 government were argued to be largely driven by instrumental objectives, with community as
206 a vehicle for achieving these objectives. Walker et al (2007) found three factors were
207 particularly appealing for UK policy makers. First, an understanding that channelling benefits
208 to local residents helped mitigate opposition to proposed wind farm developments. Second,
209 the not-for-profit legal status of community-based bodies meant they could directly receive
210 government subsidies whilst circumventing European rules on state-aid, and help to
211 stimulate the renewables market. And third, the recognition that renewable energy projects
212 could generate new sources of income and employment for areas experiencing “agricultural

213 decline, depopulation and economic collapse” (Walker et al., 2007, p. 73). There was also
214 *some* aspiration to embed participatory approaches in decision-making on energy
215 production, also evident under the ‘localist’ rhetoric of the Liberal Democrat-led approach to
216 community energy under the 2010-2015 Coalition government (Catney et al., 2014),
217 culminating in the UK’s first Community Energy Strategy (DECC, 2014b, 2015; see also
218 Smith, Hargreaves, Hielscher, Martiskainen, & Seyfang, 2016).

219 The role of central government engagement with community energy goes beyond its ability
220 to effectively catalyse or stymie civil society goals, and contributions have critically analysed
221 how governmental programmes interact with and shape the activities of community-led
222 initiatives, producing a trans-scalar politics of community energy (Bomberg & McEwen 2012;
223 Nolden 2013; Catney et al 2014; Oteman, Wiering & Helderma, 2014; Markantoni 2016;
224 van Veelen 2017). A strand of recent research has interrogated the effects of governmental
225 intervention on actions, behaviours and outcomes of community energy protagonists. A
226 common theme is to focus on how governmental rationalities and conceptualisations of
227 community energy interact with sometimes divergent understandings among those seeking
228 to develop community energy projects. The impacts of funding criteria and governmental
229 accounting regimes, for instance, are said to have shaped the work of grassroots energy and
230 sustainability movements in the UK (Creamer, 2015; Hauxwell-Baldwin, 2013; Taylor Aiken,
231 2016). This has profoundly changed the dynamic of community energy for many projects,
232 with increased emphasis on quantifying inputs, outputs and outcomes exemplifying what
233 Taylor Aiken (2016, p.28) terms ‘governing through numbers’. In his exploration of the
234 Scottish Government’s Climate Challenge Fund, Taylor Aiken describes a dramatic change
235 in the operations of one neighbourhood community group after receiving funding and
236 becoming entangled in the various practices of governing this entailed, such as meeting
237 prescriptive legal and financial arrangements, to the everyday action of recording and
238 *counting* activities, output and outcomes.

239 The rise of governmental interest in community energy has also brought charges of co-
240 option of 'community' as a policy object leading to a narrowing of the diverse manifestations
241 of community to elision *with* local, apolitical action. It has been argued that many of the UK
242 government's 'community' energy policy mechanisms have instead been aimed at
243 marketising communities or using community as a misnomer for 'meta-individual' activities
244 (Aiken, 2012; Eadson & Foden, 2014; Hauxwell-Baldwin, 2013): "These policies promote the
245 primacy of economic and market goals ahead of the idea of community as collective
246 relations, which is fundamentally 'not individual'" (Eadson, 2016, p. 1625). This juxtaposes
247 the focus on social relations, identity and normative values within community groups
248 (Hauxwell-Baldwin, 2013).

249 The past decade has produced many comparative studies of contrasting policy approaches
250 to renewable energy in different countries (e.g. Hoppe et al, 2015; White, Lunnan, Nybakk &
251 Kulisic, 2013; Sovacool, 2011; Toke, Breukers, & Wolsink, 2008) and differing 'institutional
252 space' these create for community energy (Oteman et al, 2014). Danish and German
253 governments are noted for being particularly supportive of civil society engagement with
254 energy systems, combining progressive approaches to decarbonisation and energy
255 transitions with longer held commitment to municipal, citizen and civil society involvement in
256 decision-making (Bolinger, 2001). For example, KfW, the German government-owned
257 development bank, provides low interest loans distributed through networks of local and
258 regional banks which have been instrumental in the growth of locally and cooperatively
259 owned renewable energy in Germany (Hall et al, 2016). There were almost 1,000 renewable
260 energy cooperatives in Germany in 2014 (Brummer & Herbes 2018) – a significant growth
261 from 136 cooperatives six years earlier (Hoppe et al. 2015).

262 It is important to note that central government institutions are not necessarily monolithic,
263 unified or stable. Policy arrangements must be viewed as merely 'temporary stabilisation[s]...
264 in continual flux' (Arts, Leroy, & van Tatenhove, 2006: 96). Furthermore, national
265 governments are themselves marked by competing interests and priorities, within and

266 between departments. For example, in the UK, the dissolution of the Department for Energy
267 and Climate Change and the creation of a new Department for Business, Energy and
268 Industrial Strategy in 2016 was met with some concern that policy to address climate change
269 might be undermined by ambitions for economic growth (Watson, 2016).

270 There is also scope for regions with devolved powers to design energy policies that differ
271 from or go further than national policies. For example, the Scottish Government – with its
272 own target to achieve 1GW of renewable energy capacity in community and local ownership
273 by 2020 and 2GW by 2030 (Scottish Government, 2017) – has launched various measures
274 to support community energy in Scotland since 2002. The provision of grants and loans is
275 enhanced by a range of general support and intermediary organisations designed to
276 increase community engagement in low carbon transitions (see Markantoni and Woolvin
277 2015 for the key Scottish community funding initiatives). Experiences in several northern
278 European countries, particularly Germany, Denmark and Sweden, also demonstrate that the
279 governing context at *local* government scale is a key factor in understanding the
280 development of community energy spanning the management of roles, responsibilities, and
281 relationships between different scales of government.

282 3.2 Local government

283 In several northern European countries, municipalities have taken a leading role in driving
284 forward decentralised energy systems (Webb, Tingey, & Hawkey, 2017). As well as being
285 the scale of government which interacts most with local civil society actors, local government
286 has a commitment to locality and place. Municipal government is, therefore, often framed as
287 more accessible than central government to those pursuing community energy initiatives and
288 more engaged with local priorities (Warbroek & Hoppe, 2017).

289 Hoppe et al. (2015) highlight the potential impact of local government leadership in their
290 analysis of two ‘best practice’ local energy initiatives in Lochem in the Netherlands and
291 Saerbeck in Germany. Counter to common ‘bottom-up’ or ‘grassroots’ narratives about

292 community energy projects, these projects had been “to a large extent initiated by public
293 officials... [and] success in large part was due to active, involved public leadership” (Hoppe
294 et al., 2015, pp.1917-1918). In some cases, development of community energy initiatives
295 has catalysed a reworking of relationships between civil society and local government
296 through politicisation of energy provision. For example, in Germany, the rising number of
297 community energy cooperatives as part of the country’s high profile *Energiewende*, has
298 stimulated larger scale citizen-led movements seeking to re-municipalise heat, gas and
299 electricity grids in Hamburg and Berlin into German public ownership³ (Becker, Naumann &
300 Moss, 2017; Becker, Blanchet, & Kunze, 2016; Blanchet, 2015; Kunze & Becker, 2015;
301 Moss, Becker, & Naumann, 2015).

302 In Denmark and Sweden, local government has a well-institutionalised role within the energy
303 system and established legislated responsibilities in energy planning and a history of
304 ownership and operation of energy provision and services. Hence, municipal and community
305 energy companies in these countries contribute to more diverse market in energy services,
306 working ‘in-against-and-beyond the state’ (Angel, 2017; see also Becker, Naumann & Moss,
307 2016). By contrast, in the UK, energy expertise, resources and assets are concentrated in
308 large, mainly transnational, corporations with primary responsibility to shareholders, meaning
309 local authorities have more limited institutional capacity for energy (Webb, Hawkey, &
310 Tingey, 2016). Not only has energy generation and supply been progressively centralised
311 and privatised in the UK (Chick, 2007), local government also has less fiscal and decision-
312 making autonomy to control local services overall (twinned with fewer resources conferred to
313 energy). Consequently, recent research has found considerable variation in the extent of
314 activity and planning across UK local authority action on energy (Tingey, Hawkey, & Webb,
315 2016; Webb et al, 2016, 2017).

³ The energy grids in both Hamburg and Berlin have been operated by Vattenfall, which is owned by the Swedish state

316 Where local governments do not take a leading role in developing energy projects, they can
317 nevertheless be important players in partnerships with civil society-led energy projects
318 (Castán Broto & Bulkeley, 2013). In the UK, examples include Bath & West Community
319 Energy, Low Carbon Hub (Oxford), Plymouth Energy Community (PEC), and Swansea
320 Community Energy (Webb et al, 2017). In these cases, Local Authorities supported
321 community energy project through innovative use of council resources, including access
322 buildings to host solar panels as well as access to finance, staff time and expertise. The
323 political priorities of these Local Authorities favoured community ownership and stemmed
324 from councils' history of sustainable development work, as well as recent enabling powers.
325 Supporting community energy was also considered a route to local engagement and
326 community responsibility for assets, and a source of opportunities for training, skills
327 development and empowerment, which was important in the face of dwindling council
328 resources.

329 Local Authorities and community groups may also co-invest. For example, Public Power
330 Solutions (wholly owned by Swindon Council) engaged in partnership with Abundance (a
331 green economy investment platform) to co-finance Swindon Community Solar Farm from a
332 mix of public finance and community investment (Crisp, 2016). Local Authorities generally
333 benefit from scale of assets, access to land and planning powers, and can therefore enable
334 more straightforward replication of business development for local ownership. Increasingly,
335 community projects in the UK have opportunities to partner with private sector actors, which
336 – while not without challenges – has proved successful in several cases (Goedkoop &
337 Devine-Wright, 2016; Vaughan-Morris, McNaught, Morris & Cheung, 2015). However, it is
338 argued that the nature of UK energy supply regulation plays a significant role in preventing
339 small-scale companies from entering the market (Hall & Roelich, 2015). Here, the role and
340 influence of state and community actors meets, and becomes entangled with, the role of
341 private market actors.

342 **4. THE PRIVATE SECTOR**

343 Private sector actors, such as energy utilities, developers and independent consultants, have
344 a complex and powerful influence on community and local energy projects (Rydin et al.,
345 2015), and there are important considerations to make about the extent to which market
346 actors and market-based rationalities shape the ways in which community energy is
347 conceived, mobilised and enacted.

348 Community energy projects are market actors themselves (Eadson, 2016), typically as
349 companies engaged in one or more of the core 'energy chain' activities of generation,
350 distribution, and supply. In the UK, energy generation, distribution and retail are currently
351 dominated by a few vertically-integrated energy utilities, the 'Big Six' (Koh & Groucher, 2014;
352 Shrubsole & Cameron, 2014), and their dominance affects the operations of ancillary
353 companies (such as manufacturers of equipment or providers of finance) and the structure of
354 the whole energy market. Community energy ventures, commonly classified as 'Non-
355 Traditional Business Models' (Ofgem 2015), are typically small scale and new to the
356 challenges of managing an energy project. Consequently, these organisations may lack
357 capacity to interact with large institutions in a way that is as timely and cost-effective as
358 larger private sector energy developers (DECC, 2014a). Equally, market actors whose
359 systems are organised around dealing with larger scale projects and more established
360 companies may not consider it cost-effective to engage with community groups. This applies
361 to suppliers of technologies, such as wind turbines (Gubbins, 2007), as well as providers of
362 services including finance (Hall et al., 2016; DECC, 2014a). For financial institutions,
363 community energy projects are often unattractive investments, not only because of their size
364 but also because of their geographical embeddedness as they tend to be single project,
365 single location initiatives, unable to spread the risk of project failure across multiple projects
366 and locations.

367 The broad international trend towards more decentralised energy generation (OECD, 2015)
368 is likely to force changes in large energy companies and provide additional market

369 opportunities for community energy actors. Funkhouser, Blackburn, Magee, & Rai (2015)
370 suggest that, in the USA, large energy companies are already major promoters of
371 community solar, seeing collective energy projects as more easily integrated into their
372 business models than widespread adoption of 'behind the meter' rooftop solar PV. There are
373 also some initial signs of cooperative action between energy companies and communities in
374 the UK. For example, energy company OVO Energy have established an 'OVO
375 Communities' division, which seeks to develop local energy schemes across England. To
376 date, they have partnered with three local authorities and a social housing consortium to
377 offer advice and expertise to energy schemes that address fuel poverty and prioritise local
378 energy tariffs for local residents, demonstrating an innovative partnership between cross-
379 sectoral actors (OVO Energy, 2018).

380 Despite the challenges portrayed in much of the UK literature, energy markets can be made
381 to work for community energy; community energy may even have some advantages
382 compared to private sector actors. There is some evidence that community or locally-owned
383 renewable energy projects have greater success in the land use planning process than
384 privately-owned projects, although other factors are also important (Szarka & Bludhorn,
385 2006; Bauwens et al., 2016; Warren & McFadyen, 2010). Community energy may also be
386 able to operate with lower financial returns than private sector investors (Vaughan-Morris et
387 al., 2015). While community energy project costs appear to vary more than comparable
388 private sector projects, they are not necessarily higher (Harnmeijer et al., 2015). Smaller
389 actors' power to raise finance and lessen their dependence on larger financial institutions
390 has also been enhanced by widespread access to the internet (Davis & Brauholtz-Speight,
391 2016; Yildiz, 2014).

392 **5. DISCUSSION & CONCLUSION**

393 This review of community energy from three perspectives has sought to demonstrate that it
394 is not possible to consider community energy as an entity (or set of entities) in isolation.

395 Community energy projects are unavoidably entangled with a range of different actors and
396 institutions operating at and across scales. These projects demand multi-sectoral
397 participation and the coordination of governments, public and private institutions, and
398 communities (Mulugetta et al, 2010). It is partly by virtue of the new partnerships, networks
399 and relationships engendered in this way that community energy initiatives have the
400 potential to contribute to social and political transformation (Pinker, 2018). Understanding the
401 different roles that these actors and institutions play in the development of community
402 energy projects is essential to understanding the sector as a whole.

403 Communities, however defined, cannot achieve large scale, socio-technical reconfiguration
404 single-handedly, but must be facilitated by a mixture of top-down policy and bottom-up
405 initiatives, generating “heterogeneous actor constellations and organisational landscapes”
406 (Moss et al., 2015, p. 1560). In this paper we have considered some of the interactions and
407 contestations between this plurality of actors, above all highlighting the complex effects of
408 institutional context and trans-scalar politics on how community energy emerges. Even
409 within the relatively homogeneous setting of north-western Europe, there is significant
410 variation in nationally- and locally-specific governance arrangements and their underlying
411 norms and assumptions. For example, in Germany and Denmark priorities are observed to
412 be relatively coherent and consistent between scales of governance, impacting positively on
413 the degree of cooperation towards shared goals between community organisers, market
414 actors, and national, regional and local governments. By contrast, in the UK, as well as
415 Belgium and the Netherlands, approaches to renewable energy policy are identified to be
416 less strategic, more market-led developments and greater dissonance between
417 governmental and community priorities, which coincides with smaller and less developed
418 community energy sectors (Bauwens et al, 2016; Breukers & Wolsink, 2007; Kooij et al
419 2018; Nolden, 2013; Oteman et al, 2014).

420 There is a growing recognition of the potential role that effective intermediary organisations
421 can play at the boundaries between public, private, and community actors, encouraging and

422 enabling new relationships in a complex context (Bush et al. 2017). A diverse array of non-
423 governmental intermediary organisations has emerged to mediate between communities,
424 private and state actors. These intermediaries have been observed to support community
425 energy groups in the development of a project, translating policy objectives to the local level,
426 and helping develop and nurture the types of network-oriented strategies required to 'jump
427 scale' and enact change beyond the local scale (Bird & Barnes, 2014; Hargreaves,
428 Hielscher, Seyfang, & Smith, 2013; Parag, Hamilton, White, & Hogan, 2013; Seyfang et al.,
429 2014; Strachan et al, 2015). In some instances, local authorities can take on an intermediary
430 role, making use of their 'trusted brand identity' (Webb et al, 2017) to assist in scaling-up
431 community activity. With respect to developing district heating, this role has been observed
432 to include "persuading local stakeholders of the value of district heating, and building the
433 social networks required to deliver projects" (Bush et al., 2017, p.143), both externally
434 (facilitating cooperation between local, public and private sector stakeholders) and internally
435 (encouraging cooperation across the local authority).

436 Despite the increasing recognition of the importance of intermediaries in facilitating local and
437 community energy initiatives, this type of boundary work remains under-researched (Bush et
438 al., 2017; Hodson, Marvin, & Bulkeley, 2013). Literature on the roles of intermediaries is
439 dominated by authors adopting a multi-level perspective to sociotechnical transitions,
440 analysing the role these organisations play in niche nurturing (Hargreaves et al., 2013;
441 Kivimaa, 2014). There would be value in research that sought to further unpick nuances in
442 the practices, relationships and influence of different intermediary actors, building on existing
443 work, such as Hodson et al's. (2013) analysis of the 'modes of intermediation' in urban low
444 carbon transitions.

445 Ultimately, as Becker and Kunze (2014) have argued, the term 'community energy' may not
446 be the most appropriate to describe these increasingly complex, trans-scalar decentralised
447 energy arrangements in which state, private, and community actors collide. As multi-sector
448 coalitions become more prevalent, there is a danger that the manifestation and position of

449 community actors become increasingly obscure, to the point that the 'community' of
450 'community energy' becomes an empty signifier, arbitrarily defined (Rogers et al., 2012a),
451 and little more than a means of garnering legitimacy for potentially controversial renewable
452 energy projects (Pinker, 2018). Recent community energy scholarship utilising the emerging
453 concepts of 'energy justice' and 'energy democracy' to interrogate normative assumptions
454 about participation and the relationship between community energy and normative ideals of
455 democracy and justice (e.g. Rasch & Kohne 2017; Becker & Naumann, 2017; Forman, 2017;
456 McHarg, 2016; Simcock, 2016; van Veelen 2018) is therefore welcomed. There remains,
457 however, significant scope for further conceptual and empirical work on the intersection
458 between participation and inclusion in material systems in the context of plural and dynamic
459 understandings of community energy, including the types of participation enabled and the
460 connection between inclusive participation and just outcomes.

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