Written Evidence from the Sussex Energy Group (University of Sussex)

About the authors

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SEG aims to understand and foster transitions towards sustainable, low carbon energy systems. We undertake academically rigorous, interdisciplinary and world-leading research that is relevant to contemporary policy challenges.

The authors are currently engaged in the Responsive Organising for Low Emission Societies (ROLES) project. This is exploring how European city-regions can accelerate and intensify decarbonisation, specifically looking at the role of digitalisation of energy infrastructure. Community energy is one of the focus areas for the project. https://roles.w.uib.no

1. **What contribution could community energy (through renewable power and/or energy efficiency) make to achieving net-zero by 2050 in the energy sector and its potential role in decarbonising the heat and transport sectors?**

1.1. Modelling by SP Energy Networks & WPI Economics shows that, by 2030, the community energy sector could grow by 12-20 times, powering 2.2 million homes and saving 2.5 million tonnes of CO_2 emissions every year[2], but requires appropriate funding and policy support. Modelling of the United States electricity distribution grid by Vibrant Clean Energy reveals that integration of decentralised, local solar and storage could save American ratepayers almost half a trillion dollars[3]. Their key finding is that:

"Deploying at least 247 GW of local rooftop and community solar on the grid would be the most cost-effective way to transition to a clean energy system by 2050. It is also the most cost-effective way to reach 95% emission reductions from 1990 levels."

1.2. While this is specific to the United States, the dynamics and conditions they describe largely parallel those here, and similar relative savings and benefits can be expected. For example,

[1] See https://www.sussex.ac.uk/research/centres/sussex-energy-group
[2] WPI Report – The Future of Community Energy https://www.spenergynetworks.co.uk/pages/wpi_report_the_future_of_community_energy.aspx
[3] Vibrant Clean Energy - EXPANDING LOCAL SOLAR AND STORAGE COULD SAVE RATEPAYERS NEARLY A HALF A TRILLION DOLLARS https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/LocalSolarRoadmapPressRelease_FINAL.pdf

they model the ability of local solar and storage to serve local loads, and reduce peak loads as appropriate, for optimising wider system functionality. They further quantify the potential of local and community solar and storage to reduce the need for buildout of costly distribution and transmission infrastructure, and additional utility-scale generation. Their modelling also highlights job creation, heightened resilience, local economic development and improved distribution of access to the benefits of renewables.

1.3. The takeaway is that community and local energy is key to facilitating a larger transition, optimising utility-scale renewables transitions and facilitating wider electrification, with benefits across the power, heat, and transportation sectors.

2. How well are the financial and technical needs of setting up and running community energy projects met by existing Government support mechanisms? What changes would be needed to the access or nature of support to develop community energy further?

2.1. Because the economic benefits of community solar are not concentrated in one area, but instead span different policy domains, the extent to which diverse community entities can compete in traditional capacity markets is constrained. This is because value in these markets is solely based on ability to produce low-cost kWh. Cost per kWh can be higher for many forms of community energy, but broader economic benefits are found with respect to:

- Jobs creation and skills development
- Lower transaction costs when seeking acceptance for renewable infrastructure development
- Improvements in subjective pro-environmental behaviours and reduced environmental impacts
- Local economic development
- Upgrades to community facilities and infrastructure
- Social capital
- Local disaster resilience, etc.[4]

These benefits come in addition to embedded energy benefits to the grid. Guaranteed rates allocated to community energy should not be framed as subsidies, but instead should be conceived in terms of public value. Community energy generators need to be provided with fair recompense for the above suite of social and economic benefits that are not accounted for in traditional capacity markets.

2.2. Regulations here should follow those set out for Renewable Energy Communities under the Renewable Energy Directive (RED II) in the 2018 EU Clean Energy Package. This includes: removing barriers to market entry for community energy; facilitating the operation of these entities, and; protecting their integrity from interests seeking to exploit the technical benefits of local models without returning the full set of broad-spectrum potential benefits.

[4] Smith, A., Hargreaves, T., Hielscher, S., Martiskainen, M., & Seyfang, G. (2015). Making the most of community energies: Three perspectives on grassroots innovation. *Environment and Planning A*, *48*(2), 407–432. https://doi.org/10.1177/0308518X15597908

An attempt should be made to quantify the positive externalities of a wide variety of community energy types (e.g. a detailed breakdown of the impacts of Community Benefit Funds established by numerous community energy groups across the UK and supported activities within local economies), so that these can be appropriately incorporated into financing schemes, market operations and public support.

3. What are the main barriers to development of new community energy schemes under the current regulatory regime? Do lack of connection or high access charges to the electricity grid pose an obstacle? How could these be overcome?

3.1. There is a complete lack of guidance, and of any strategy, from UK central Government on energy decentralisation, local energy and community energy. Growth in community renewables projects has slowed significantly: between 2016 to 2018 new community energy organisations dropped by 81%. In addition, the greatest barriers to community energy in 2019 were found to be the reduction and removal of subsidy support, in particular the 2020 closure of the Feed-in Tariff (FiT) scheme[5] (also see recommendations in 2.2).

3.2. Established community energy groups – those that have accumulated experience, skills, and resources (including capital) through earlier projects - are able to develop new energy generation projects. However, the way the market is currently structured means that for new project to be viable, they generally have to be of a scale and complexity that tests the means of smaller or newly created groups. Consolidation may be possible, but the prospects for expansion are currently unclear. Furthermore, the variety of community energy forms, the locations in which that variety is appropriate, and the types of beneficiary, may all diminish as market-driven business models increasingly dominate over more mixed community purposes.

3.3. The main barriers to the development of new community energy schemes are therefore a lack of adequate market access mechanisms, and the lack of any guiding strategy or document from central Government. The Government have not outlined any future scenarios or transition pathways where community energy plays a significant role in the energy system and generates a substantial proportion of the UK's low-carbon energy mix. There needs to be central Government leadership, firstly, to give confidence to the UK sector overall.

3.4. Energy systems are undergoing profound transformations. In the absence of a coherent and adaptive strategy for community energy, there is a risk it will end up finding niches in future systems by default, rather than playing a decisive role by design. Digitalisation strategies in particular need to have a component that conceives, understands and develops digital and future energy services through a community energy lens. Open and cooperative ways of organising energy data,[6] for example, could benefit from community participation or even

[5] Community Energy State of the Sector Report (2020) https://communityenergyengland.org/files/document/387/1592389779_CommunityEnergy-StateoftheSector2020ExecutiveSummary.pdf

ownership. Similarly, in the development of aggregation services, flexibility platforms, demand-side services, or battery storage and EV charging points, the scope for diverse community participation and securing collective benefits for localities should be a clear element in transformation strategies (see 3.2).

3.5. The devolved picture for community energy currently remains mixed; the Scottish government continue to support community energy schemes through Local Energy Scotland, whilst the Welsh government oversees the Welsh Government Energy Service, which supports community energy. There appears to be little comparable activity in Northern Ireland and, following the above comments, the UK has no support programme – in fact the Community Energy Unit, established within the former DECC, no longer exists. At the very least, BEIS should establish some kind of supportive function within its own policy team, be it the reestablishment of the Community Energy Unit and/or Local Energy Team or something different entirely, e.g. a 'Local and Community Energy Unit'.

4. What role should Ofgem play in supporting community energy and resolving regulatory issues, such as decentralisation and incorporating community energy projects into smart electricity grids?

4.1. Ofgem needs to provide a clear framework and set of procedures for coordinating connections and assets. Frameworks should be sensitive to different community energy organisational forms and activities, such as demand-side initiatives versus generation projects. On the grid, priority should be given to community and local energy connections, given their associated positive externalities, followed by utility-scale renewables, followed by transmission and, while still present, fossil assets. Ofgem should have a step-by-step manual for local or community interests seeking a grid connection and market access.

4.2. The grid can no longer be centrally controlled. There is a need for an integrated, multi-level network of regional and local coordinating bodies. Supply and demand should first be balanced locally, then balanced at the regional level, and turning to remote utility-scale assets and transmission when these options have been exhausted. This is the lowest cost solution, with the greatest distribution of social and economic benefits, and the lowest level of transmission losses. There are potential models and key concerns further discussed in Roberts 2018[7], Brisbois 2020a[8], and the Energy Systems Catapult Future Power Systems Architecture documents[9].

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[6] Stowell, D., Kelly, J., Tanner, D., Taylor, J., Jones, E., Geddes, J., & Chalstrey, E. (2020). A harmonised, high-coverage, open dataset of solar photovoltaic installations in the UK. *Scientific Data*, *7*(394), 1–15. https://doi.org/10.1038/s41597-020-00739-0

[7] Roberts, D. Clean energy technologies threaten to overwhelm the grid. Here's how it can adapt. Vox (2018). December 2018, https://www.vox.com/energy-and-environment/2018/11/30/17868620/renewable-energy-powergrid-architecture.

[8] Brisbois, M. C. (2020a). Decentralised energy, decentralised accountability? Lessons on how to govern decentralised electricity transitions from multi-level natural resource governance. Global Transitions, 2, 16-25. https://doi.org/10.1016/j.glt.2020.01.001

[9] Energy Systems Catapult, Future Power Systems Architecture project https://es.catapult.org.uk/wp-content/uploads/2017/08/FPSA-Summary-Report-130716-secured-2-1.pdf

4.3. Generally, facilitation of smart grid systems, and citizen acceptance, will required clear data protections, and assurances that the economic benefits of energy data will not be unfairly exploited. There is currently little trust amongst domestic customers in data protection systems in this area, one example being public perceptions of the data gathered by smart meters[10]. This this is a key barrier for Ofgem to overcome, in collaboration with relevant government partners and agencies.

5. What role can local authorities play in developing community energy, for example in planning, decision making and the availability of sites for energy generation?

5.1. Local authorities have a key role to play here. They are already undertaking this role in most countries where central governments (as in England), are generally unsupportive of community energy (Brisbois 2020b)[11]. In the Netherlands, local governments are required to coordinate with DNOs (Distribution Network Operators) and DSOs (Distribution System Operators) to collaboratively produce local plans that meet system and local planning needs and rules. This should be required here, although local authorities require significantly more resources to do this in an adequate fashion.

5.2. Ofgem must also work with, and support, other regulatory agencies relevant to the expansion of community energy. This includes, for example exploring the means for building up energy policy and planning capabilities in local authorities, so that the latter can better support community and local energy initiatives. Increasing, DNOs need to coordinate their energy planning with local authority planning, which can be hampered at times by limited capabilities in local authorities. Given improved capabilities will benefit DNOs and local suppliers alike, then perhaps a public levy for investing in local authority capacity could be considered within the price control framework for DNOs.

6. How can policy ensure that community energy projects maximise their positive impacts (social, environmental, economic) on the local communities?

6.1. Policy can offer and/or reintroduce tax incentives for the legal structures that are typically used by community energy organisations, on the condition that the projects that they are operating contribute towards carbon emissions reduction and legislated net zero targets. This could mean, for example, that Co-operatives, Community Benefit Societies and potentially Community Interest Companies could receive lower taxes on profits and a

[10] Sovacool, B.K. (2017). Vulnerability and resistance in the United Kingdom's smart meter transition. Energy Policy, Volume 109, Pages 767-781 https://doi.org/10.1016/j.enpol.2017.07.037

[11] Brisbois, M. C. (2020b). Shifting political power in an era of electricity decentralization: Rescaling, reorganization and battles for influence. Environmental Innovation and Societal Transitions, 36, 49-69 https://doi.org/10.1016/j.eist.2020.04.007

reduced VAT rate on goods purchased in support of local projects. In addition, government can reintroduce the Social Investment Tax Relief (SITR) for community (renewable) energy, which offered a 30% tax relief to investors on social enterprise and community businesses. Also, please see our comments in sections 3, 4 and 5.

6.2. Policy-makers must integrate community energy participation into wider energy and non-energy policies. For example, digitalisation strategies should be designed to ensure community groups have access to open energy data. Digitalisation policy and strategy lacks a coherent framework currently for matters of inclusion and social justice, despite increasing awareness of the importance of these issues to the eventual success of decarbonising our energy systems[12]. Community energy initiatives can be well placed to engage participation in emerging energy systems, and community activity can inform strategies for inclusion by design. This may compare favourably to the largely technology-based development of digital services, which is informed by early adopters and notional 'smart' and 'flexible' users. There needs to be a programme of innovation funding for community-owned and community-benefit energy digitalisation services, which must feed into and inform the wider digitalisation strategy. The same should apply to any forthcoming industrial programmes for green industrial strategy so that, for example, community energy groups can participate in apprenticeship and training schemes (either as hosts or trainees).

6.3. New legislation, such as the Local Electricity Bill[13] proposed by community energy advocates - and currently undergoing its second reading in the House of Commons - should ideally become law and if so, this will provide the legislative foundations for community energy organisations to become local electricity suppliers. We would argue that a clause or amendment should be added to this bill, in which only social enterprise and community models can become local electricity suppliers. In 2019, community energy contributed £4.6 million to local economies. Much of this comes from Community Benefit Funds established by community energy organisations using Community Benefit Society, Co-operative and Community Interest Company legal structures. Ofgem should therefore prioritise social enterprise models such as these when approving new local electricity suppliers.

7. What are exemplars of successful community energy systems from across the UK's urban and rural communities; what makes them so successful?

7.1. Bristol Energy Co-operative are one of the largest community energy co-operatives in the UK, who have managed to continue to develop projects and support various local community groups and have invested in the local economy. Since their founding in 2011, they have raised over £12 million, installed over 9MW of solar and battery assets and facilitated over £250,000 of community benefit payments to local organisations. They are

[12] Roberts, S., Bridgeman, T., Hodges, N., & Sage, C. (2020). *Smart and Fair? Exploring Social Justice in the Future Energy System*. Bristol. https://www.cse.org.uk/downloads/reports-and-publications/policy/energy-justice/smart-and-fair-phase-1-report-september-2020.pdf

[13] Campaign for Local Electricity Bill - https://powerforpeople.org.uk/the-local-electricity-bill

currently in the process of seeking investment for the Bristol Community Hydro Scheme, which aims to generate 300KW, enough to power 250 homes.

7.2. In addition, the co-operative has established an innovative partnership with a local regeneration organisation, Ambition Lawrence Weston, based in Lawrence Weston in North West Bristol. Lawrence Weston is in the top 10% of deprived areas in England and the establishment of the Lawrence Weston Community Solar Farm, supported by Bristol Energy Co-operative, has secured a payment of £155,000 to Ambition Lawrence Weston to support their community-oriented regeneration activities. This payment is '£43,000 up front for the first year […] then £23,000 for the next four years' (Lacey-Barnacle 2020)[14]. This activity has fed into other ongoing activity around local renewables. In 2020, Ambition Lawrence Weston were successfully granted planning permission by the city council to deploy a 150m 4.2 MW onshore wind turbine in the local area, which will be owned by Ambition Lawrence Weston and will generate revenue for the local community.

7.3. One of the reasons that Bristol Energy Co-operative are so successful is due, in part, to their legal structure as a Community Benefit Society (CBS). A CBS is required to cater to the 'wider community' beyond their members. Given that this is a legal mandate that is embedded in the organisational structure, Bristol Energy Co-operative have sought ways to meet these obligations, largely through community benefit payments and innovative partnerships with local organisations, as outlined above. They also operate an open and transparent democratic voting structure and invest heavily into the local community, ensuring that much of the profit that they generate from renewables projects flows into the community and supports the local economy. We believe it is this combination of legal structure, democratic governance and investment into the local economy, which supports local economic multipliers, that makes them a success.

8. Relevant Projects at the Sussex Energy Group

8.1. Responsive Organising for Low Emission Societies (ROLES)[15] is exploring how European city-regions can accelerate and intensify decarbonisation, specifically looking at the role of digitalisation of energy infrastructure and focusing on pathways that also create social benefits (such as reducing fuel and transport poverty). The project is working in the UK, Italy and Norway, with case studies in all three countries. The project started in late 2020 and will run for three years.

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[14] Lacey-Barnacle, M. (2020). Proximities of energy justice: contesting community energy and austerity in England. Energy Research & Social Science, 69, 101713.
[15] https://roles.w.uib.no