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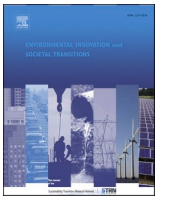

Research article

Institutional work and social skill: the formation of strategic action fields for local energy systems in Britain

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ABSTRACT

The concept of Strategic Action Fields (SAF) is combined with analysis of institutional work to investigate the tactics actors adopt to support or deter policy for integrated local energy systems. Integrating heat, power, and mobility systems at local or regional scale would entail highly significant changes in energy systems yet is an area of increasing policy interest. We explore how this field is being constituted differently across the devolved jurisdictions of Great Britain, but faces similar challenges. The obduracy of legacy centralised institutions is a powerful force in blocking new sustainable energy SAFs, with Government retaining significant countervailing power. Additionally we demonstrate how overlaps between policy domains can obstruct the formation of new rule structures; notably emerging local energy planning rules are constrained by wider limitations in devolved governance powers. These findings raise questions about whether net zero can happen, and in what form, under current multi-level governance structures.

1. Introduction

There is increasing policy and practitioner debate about integrated local energy systems (LES) in many countries (Fuchs and Hinderer, 2016b; Lammers and Hoppe, 2018; Ford et al., 2021). In Great Britain this is a surprising development, given long-established commitments to economies of scale through centralised energy supply, and a single market. Incorporating integrated heat, power, storage and mobility systems at local or regional scale would entail highly significant material changes in energy provisions, regulation and markets. It would constitute a turning point in technical-economic logics in place for the past century. Local energy system integration is however now regarded as potentially contributing to faster, cost-effective and resilient whole system decarbonisation, with benefits for local regeneration and welfare (Ofgem, 2017; Devine-Wright, 2019; Wilson et al., 2020).

Whilst there is debate about boundaries and components of LES, such systems emphasise bottom up system optimisation and coordination across electricity, heat, storage and transport. They can involve a range of technical and social innovations, including decentralised generation, more active management of distribution networks, new stakeholders such as community groups, local authorities and digital novators, and increased focus on the demand side and flexibility services (Ford et al., 2021; Walker et al., 2021; UKRI, 2022).

This paper examines policy interest in local energy systems in the context of UK devolved government, focusing on the formation of new policy fields and their implications. Devolved government provides a natural experiment for comparative policy analysis as, while the main powers over energy markets, licensing, and regulation are reserved to the Westminster parliament, devolution created

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Scottish and Welsh parliaments[1] with powers relevant to energy systems' change. These include economic development, environment, social and welfare policies, and infrastructure planning and consenting. All three parliaments have climate protection commitments, but different political control creates motives for policy and institutional divergence (Webb and van der Horst, 2021). The case also provides scope for wider insights on climate governance under devolution given that devolution is an international phenomenon (Mackinnon, 2015; Tomaney, 2016).

We aim to contribute new insights into policy and institutional processes at the interface between devolved government and potentially radical shifts to more decentralised, integrated energy systems in Britain. The concept of Strategic Action Fields (SAF) is used to investigate emerging policy and institutions geared to integrated local energy systems, paying attention to 1) how this new field is being constituted in different UK jurisdictions and 2) the work undertaken by actors in seeking to create new, or maintain or destabilise established, institutional structures configuring the field. We make two distinctive contributions to knowledge: first the conceptualisation of the institutional work surrounding energy systems transformation, and second original empirical data demonstrating the differential formation of strategic action fields to support local energy systems across Britain.

We contend that SAF concepts have given too little weight to the work of 'doing institutional change' and therefore combine SAF with socio-technical accounts of institutional dynamics. This enables more insight into gradual processes of change, relationships between incumbents, challengers and regulating structures, and interlinkages between fields. Combining SAF concepts with socio-technical accounts of institutions also extends the latter, overcoming the neglect of interactions between proximate policy fields. This provides detail on the obduracy of existing fields and how governance structures in proximate fields can shape emerging SAFs.

Empirically we analyse the social processes involved in framing the 'local energy systems' policy field, negotiating legitimate action and encoding shared meaning systems in institutions. The study addresses the following research questions: What strategic action fields are emerging around the interest in more local and decentralised energy systems in GB? How are these manifested in England, Scotland and Wales, and what is driving any differences in strategic action fields?

2. Conceptual approach: strategic action fields and socio-technical transitions

Sustainability transitions theory has increasingly incorporated actor dynamics (Geels and Schot, 2007), drawing on institutionalist and political economy perspectives to analyse agency, politics and power (Fuenfschilling and Truffer, 2014; Avelino and Wittmayer, 2016; Brisbois, 2020). Although distinct from institutionalist theories, Fligstein and McAdam's (2011) theory of Strategic Action Fields (SAF) is concerned with similar questions of agency, stability and change. In formulating SAF theory Fligstein and McAdam's (2011) critique rational-choice and sociological neo-institutionalist approaches such as DiMaggio and Powell (1991) as reducing actors to passive recipients of institutions, and over-emphasising the stability and durability of established rules and resource allocation. In contrast SAF theory draws on earlier work on social power, social movements and action fields (Bourdieu and Wacquant, 1992; Fligstein, 2001) to incorporate the concept of social skill in strategic use of rules and resources. This aims to provide a more dynamic theory of agency in field formation with Fligstein and McAdam (2011, p. 9) defining a SAF as:

> 'a constructed meso[2]-level social order in which actors (who can be individual or collective) are attuned to and interact with one another on the basis of shared (which is not to say consensual) understandings about the purposes of the field, relationships to others in the field (including who has power and why), and the rules governing legitimate action in the field'

Any particular SAF is understood as vertically and horizontally nested in a multiplicity of overlapping or intersecting fields. Field boundaries are subject to a degree of fluidity, and rules and resource allocation have to be continually (re)produced by skilled actors, who may work to (re)frame what is legitimate in a specific domain. These shared, but not necessarily consensual, meaning systems are encoded in a field's institutions (Furnari, 2016; Moulton and Sandfort, 2017), which comprise formal and informal rules, norms and definitions of legitimate practices. These sets of rules shape action through relational and discursive processes (Britton et al., 2022).

The formation of policy-oriented SAFs hence involves crafting rationales for engaging in particular kinds of policy making, establishing power relations among interested actors, defining what resources, actions and networks can legitimately be mobilised, and developing rules to govern action (Candido et al., 2019). Core mechanisms are 1) the collective construction of threat or opportunity, 2) resource mobilisation by actors, and 3) innovative action, for example violating field rules and/or efforts to create and embed new rules (Fligstein, 2001; Fligstein and McAdam, 2011). Many SAFs have internal governance units, such as trade associations or accreditation bodies, that may facilitate circulation of information and ideas, re-assertion of major interests or representation of the field to others. All fields are socially situated, based to some degree on shifting collections of actors, and are thus always forming and reforming. This fluidity creates scope for disruption by challengers or, conversely, for incumbent actors to reproduce dominance. Incumbents and challengers typically have differential capacity to mobilise resources and influence rules, and all have something to gain or lose. Incumbents are the dominant actors, whose interests tend to be reflected in the organisation of the field. Challengers occupy less privileged positions and have less access to critical resources, but promote alternative field framings and institutional change (Fligstein and McAdam, 2011). The dynamics of strategic interaction create scope for actor understandings of what is at stake to change through negotiation and compromise.

[1] The single energy market in Britain does not include Northern Ireland; hence the analysis concerns England, Scotland and Wales.

[2] Fligstein and McAdam's (2011) use of 'meso-level' refers to the constitution of particular forms of social order through interactions between representatives of groups and organisations with differing interests and motives, and who each have something at stake. The aim is to provide insight into the forms of 'connective tissue' between individuals, or micro-level, and society, or macro-level.

The ability of SAF theory to analyse agency, stability and change in regimes has led to its increasing application to sustainability transitions. Kungl and Hess (2021) review the resulting literature and identify five theoretical clusters where there are opportunities to enrich research, and where transitions researchers have added to theoretical development. The clusters comprise:

1. Actor relations and resources
2. Change, emergence and destabilisation
3. Field rules
4. Agency framing and coalitions
5. Strategic action in the inter-field matrix.

These themes outline how key variables in SAF formation can offer insight into transition processes and start to connect SAF theory to some of the institutionalist approaches adopted in transitions research. However Fligstein and McAdam (2011) initially critiqued neo-institutionalist approaches based on the excessive importance placed on existing rules and resources. In particular, they were critical of the notion of institutional logics on grounds that it over-emphasises conformity in line with the dominant 'logic'. Even when analyses acknowledge that multiple logics may be operating simultaneously, and possibly in conflict, Fligstein suggests that it 'does not solve the problem of how we recognise what a 'logic' is, who its agents are, and how conflict in a field is over who agrees and disagrees with the 'logic'' (Fligstein and Vandebroeck, 2014, p. 110).

Institutionalist thought has become much more specific in analysing institutional logics since these criticisms (such as Fuenfschilling and Truffer, 2014; Weisenfeld and Hauerwaas, 2018; Wittmayer et al., 2020), but limitations in ability to analyse emergence or interlinkages between policy fields persist. In line with Huttunen et al. (2021, p. 2) we suggest that mechanisms of change can be studied in more detail by enriching institutional approaches with a focus on 'individuals and their abilities', as provided by SAF theory.

In parallel the SAF framework has been criticised for its limited capacity to analyse the doing of institutional work (Goldstone and Useem, 2012; Kungl and Hess, 2021). This can lead to explaining SAF formation and change in terms of a dichotomy between incumbents defending the status quo and challengers using exogenous crises to reframe fields. Energy transition research using a SAF analysis is starting to recognise the importance of ongoing negotiation of field rules and the variegated roles of incumbents (Fuchs and Hinderer, 2016; Heiskanen et al., 2018; Koehrsen, 2018). However research on the processes by which field rules develop and the implications of interactions between fields remains limited (Fuchs and Hinderer, 2016; Mey and Diesendorf, 2018).

We therefore combining institutional work analysis with SAF emphasis on social skill to better connect institutions and the work actors undertake to create, maintain, disrupt them. This serves to 'open the box' on complex social interactions to reveal more about the dynamics of institutional change and innovation. We use an analytic framework developed by Fuenfschilling and Truffer (2016), which builds on Lawrence and Suddaby (2006). The latter defined institutional work as 'the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions' (Lawrence and Suddaby, 2006, p. 215). Emphasis on institutional work recognises that actors are both constrained and enabled by institutional structures, which may, in turn, be reconstituted by them. This perspective invites investigation of endogenous and gradual processes of change (Fuenfschilling and Truffer, 2016), including (re-)defining field boundaries and intersections, and potential for development of new SAFs where fields overlap (Evans and

Table 1
Forms of institutional work.

Forms of institutional work	Definition
Creating institutions	
Advocacy	The mobilization of support through persuasion.
Constructing identities	Defining the relationship between an actor and the field.
Changing normative associations	Re-making the connections between sets of practices and the moral and cultural foundations for those practices.
Constructing normative networks	Construction of inter-organizational connections which normalise practices and form peer groups for monitoring/ compliance.
Defining	The construction of rule systems that confer status or identity, define membership or create hierarchies.
Vesting	The creation of rule structures that confer property rights.
Mimicry	Associating new practices with existing sets of practices, technologies and rules.
Theorizing	Explaining roles and cause-effect chains
Maintaining institutions	
Enabling work	The creation of rules that support institutions.
Deterring	Establishing coercive barriers to institutional change
Policing	Ensuring compliance through enforcement, auditing and monitoring
Valorizing and demonizing	Providing positive and negative examples that illustrates the normative foundations of an institution
Mythologizing	Preserving the normative underpinnings of an institution by creating and sustaining myths regarding its history
Embedding and routinizing	Infusing the normative foundations of an institution into routines and practices
Disrupting institutions	
Disconnecting sanctions	Working through state apparatus to disconnect rewards and sanctions from practices, technologies or rules
Disassociating moral foundations	Disassociating the practice, rule or technology from its moral foundation
Undermining assumptions and beliefs	Decreasing the perceived risks of innovation and differentiation by undermining core assumptions and beliefs

Adapted from Fuenfschilling and Truffer (2016).

Kay, 2008; Furnari, 2016).

Using Fuenfschilling and Truffer's (2016) framework, Table 1 identifies and defines categories of strategic action which may be deployed to create, maintain or disrupt institutions and fields. This categorisation provides a framework to analyse how action within existing and emerging fields aims to shape norms and rules. There is a risk that such category systems create somewhat artificial, and static, representations of complex and continuous socio-political dynamics, potentially neglecting their overlaps and complementarities. We return to the value and limitations of such taxonomies in the discussion. Table 1 follows the forms of institutional work as identified by Fuenfschilling and Truffer (2016) but reorders the categories to better reflect the institutional work evident in the LES case.

3. Method

A three-stage method was used to analyse institutional work exemplified in developing local energy system SAFs: desk-based review of decentralised and local energy policy narratives in England, Scotland and Wales; development of institutional maps of the key formal LES structures in each jurisdiction, and twenty one in-depth interviews with energy system stakeholders.

The initial review of policy narratives was based on a database of energy and net zero strategy documents across England, Scotland and Wales, prepared at an earlier stage of this research. The database consisted of 50 current and draft policy documents or strategies, as well as formal advice from Government agencies. Each document was searched for references to decentralised energy, local energy, integrated energy systems, distributed energy and community energy.

Based on this database of policy documents and an additional database of 105 policy instruments relevant to integrated local energy systems (also prepared as part of an earlier stage of research), institutional maps of LES in each jurisdiction were produced. Institutional mapping aims to explore functional relationships and powers that are relevant to decision-making in a policy field. It focuses on the key actors within an issue space, interactions, influence, decision-making, and funding (Mcfadden et al., 2010). The objective was to create a simplified visual representation of the formal governance structures, actors and relationships in LES in order to use the maps as an interview tool to further explore the contours of the policy field, governance logics and informal norms (Aligica, 2006). These maps are provided as supplementary material.

The institutional maps were used as a discussion tool in twenty-one semi-structured interviews with LES stakeholders, as detailed in Table 2. Interviewees were selected to include a wide range of the stakeholders identified in the institutional mapping exercise, including those more likely to be acting as incumbents such as central governments, electricity network operators, and trade associations. Additional actors involved in challenger activities, such as local energy innovation projects, were interviewed including local authorities and NGOs. Interviewees are listed in Appendix A. Eight interviewees were with England/UK focussed stakeholders, seven were Scottish stakeholders and six were Welsh stakeholders. These interviews discussed the formal and informal institutional structures shaping LES development, including rules, norms, agenda setting power, future policy needs and governance gaps. Interviewees were asked to define their understanding of a local energy system and prompted in relation to their experience of key relationships, norms, influence and resources mobilised to embed specific approaches to LES. Interviews took place between February and June 2022 and were recorded and transcribed. Interview transcripts were qualitatively coded using the categories of institutional work outlined in Table 1.

4. Research findings and discussion

4.1. Strategies for local energy systems in England, Scotland and Wales

Overarching policy and strategy relating to GB LES are set by central (UK[3]) and devolved (Scottish and Welsh) governments. Economic regulation, energy system rules and innovation approaches are set by Government agencies including the regulator (Ofgem) and innovation agency (Innovate UK). UK local governments have few formal roles on energy system planning or delivery, but lead on transport and spatial planning, are increasingly developing cross-vector energy plans and often have ambitious net zero commitments. Electricity Distribution Network Operators (DNOs) and Gas Distribution Network Operators (GDNs) plan, operate and maintain regional energy networks as regulated entities. Energy suppliers and other innovators are expected to be significant in bringing forward the new technologies and business models to enable more local integration across supply and demand. Many not-for-profit agencies and community energy groups are also involved, particularly in Scotland and Wales where organisations like the Carbon Trust and Energy Savings Trust play important advisory and delivery roles.

Multiple net zero and energy strategies across Great Britain refer to 'Local Energy Systems' (Scottish Government, 2017c; UK Government, 2021; Welsh Government, 2021a; Scottish Government, 2023), although material commitment remains uncertain. The UK Net Zero Strategy emphasises the interactions between LES, smart flexibility, and local economic growth. The benefits of a 'place-based approach' are discussed, but the government states that there are 'no net zero statutory targets on local authorities or communities in the UK, and we do not believe that a new general statutory requirement is needed' (UK Government, 2021, p. 263). In addition, the 2022 Energy Security Strategy says little about local energy aside from emphasising 'locally-responsive' energy networks and the need to ensure local benefits from onshore energy infrastructure (UK Government, 2022). Later in 2022, a UK Parliament

[3] The jurisdiction of UK Government policy does however vary with some policy applying on a UK-wide basis whilst others relate only to England or to England and Wales. This reflects the complex practicalities of governing across distinct but interlinked jurisdictions.

Table 2
Categories of interviewees.

Category	Number
Central and devolved governments	4
Local governments	5
Electricity distribution network operators	2
Academia	1
Non-governmental public bodies/advisory organisations	4
NGOs and advocacy organisations	5
Total	**21**

Environmental Audit Committee report criticised the British Energy Security Strategy describing it as a '20th century approach… prioritising the construction of big, centralised power generation facilities to meet fixed demand' (UK House of Commons Environmental Audit Committee, 2022, p. 84). Instead, the report advocated for a strong focus on smart, flexible system operation. Similarly, the 2023 Independent Review of Net Zero carried out by Rt Hon Chris Skidmore MP suggested that there was a need for greater coordination as the energy system decentralises and that the relationship between central and local government on net zero should be reformed (Chris Skidmore MP, 2023). The UK Government's response to the Independent Review of Net Zero, and the 2023 Energy Security Plan, however, limit reference to LES to identifying that Ofgem are consulting on governance arrangements for local energy institutions (UK Government, 2023b, 2023a).

The 2017 Scottish Government Energy Strategy presented a decarbonisation vision based on three core principles: a whole system view, an inclusive transition and a smarter local energy model. LES are referred to 38 times, compared to nine and ten times in the UK and Welsh Government strategies respectively, with emphasis on how planning and deploying energy systems on 'an area-by-area basis—can transform both rural and urban communities' (Scottish Government, 2017c, p. 13). In 2021 a Local Energy Policy Statement set out the Scottish Government's definition of LES as well as ten principles for delivery. These principles include a commitment to local engagement and planning (Scottish Government, 2021c). However, in 2022 a draft Energy Strategy and Just Transition Plan[4] was more ambiguous. While the strategy refers to thriving 'national, regional and local energy economies' there is little about what this entails, with discussion limited to reference to shared community ownership of energy generation and the need to maximise potential for local energy employment (Scottish Government, 2023, p. 7).

In Wales, indicative support for LES is more consistent. Net Zero Wales Strategy highlights an ambition to develop an energy system that delivers 'wider economic and social benefits for Wales than the current system' and connects LES to 'greater benefits to local communities'…'employment opportunities and exportable expertise' (Welsh Government, 2021a, p. 54). A system based on smart, flexible system operation is highlighted in the context of 'a regionally planned approach, rather than a top down, market driven approach' (Welsh Government, 2021a, p. 54). The strategy reiterates the Welsh target to have 1GW of locally owned renewable energy generation capacity by 2030 and the subsequent Renewable Energy Deep Dive stated that the Government will accelerate actions to maximise local ownership of energy generation (Welsh Government, 2021b, p. 2).

4.2. Analysing institutional work

Given the emerging differences between policy frameworks in England, Wales and Scotland, this section analyses the forms of institutional work instrumental in creating such local energy policy fields, or in disrupting or maintaining existing fields. The forms of institutional work identified by Fuenfschilling and Truffer (2016) are used to analyse activity across GB. Research data were analysed against all forms of institutional work identified in table 1, however these forms of work were differentially evident so analysis is structured using the macro-categories of creating, maintaining and disrupting fields with each section focussed on the types of institutional work most clearly evidenced. Recognising the overlaps and interactions between many of the forms of institution work, categories are grouped for discussion as outlined in table 3. There was limited evidence of vesting, mimicry and theorizing forms of 'creating' institutional work or of policing, valorizing and demonizing, or mythologizing forms of 'maintaining' work, therefore these categories are not directly discussed in the following section.

4.2.1. Creating institutions

The forms of institutional work most evident in creating LES SAFs in GB relate to *advocacy* to mobilise actors around the importance of LES, as well as the creation of *networks* and *identities* that link LES to multiple energy system outcomes, and creation of LES roles for a range of challenger and incumbent actors. In relation to formal institutions, the *defining* of rule structures and mobilisation of resources to create new rules, were important elements of efforts to create new LES SAFs.

4.2.1.1. Advocacy, and constructing networks, associations and identities. Central and devolved governments, local government, Innovate UK, consultancies, not-for-profits and DNOs all undertook advocacy to emphasise the important role LES could have in decarbonisation. However, boundaries and definition are subject to contention with different elements emphasised by different actors.

[4] The consultation closed in May 2023 but, at the time of writing, a final plan was not published.

Table 3
Application of Fuenfschilling and Truffer's (2016) categories of institutional work to interview data.

Analysis category	Forms of institutional work	Key features
Creating institutions		
Advocacy, and constructing networks, associations and identities	Advocacy	Persuasion
	Constructing identities	Actor relationship to the field
	Changing normative associations	Normative rationales for practices
	Constructing normative networks	Inter-organizational connections
Defining rule structures and resources	Defining	Rule systems and resources
Maintaining institutions		
Enabling and embedding	Enabling work	Rules that support institutions
	Embedding and routinizing	Infusing the normative foundations of an institution into routines and practices
Deterring and interfield relations	Deterring	Coercive barriers to institutional change
Disrupting institutions		
Disrupting institutions	Disconnecting sanctions	Disconnect rewards and sanctions from existing institutions
	Disassociating moral foundations	Disassociating the practice, rule or technology from its moral foundation
	Undermining assumptions and beliefs	Challenging core assumptions and beliefs to reduce perceived risks

The construction of these frames and associations nevertheless converged around a core view of LES comprising decentralised, renewable and energy saving technologies, local planning, and maximising local social and economic benefits.

In current Government strategies, a LES field is distinguished from community energy or distributed energy generation through distinct associations between supply and demand side activities (Scottish Government, 2017c; UK Government, 2021; Welsh Government, 2021c; Scottish Government, 2023). This broadly defined action space was echoed across interviewees with identification of LES as a complex mix of social and technical elements across supply and demand (Fuentes Gonzalez et al., 2021).

Despite similarities in overall framing, there were clear differences between actors in different jurisdictions over the drivers of change. In England, innovation and economic growth rationales, as advocated by the UK Government, Innovate UK and Ofgem, were most persuasive with an emphasis on the role of smart, flexible networks and new consumer business models. LES was described by a Government interviewee as '…providing routes to market, new business models and new models for local generation' (interview 1). This normative rationale for LES positions people as consumers and prioritises leveraging private sector investment (Devine-Wright, 2019; Smith et al., 2023).

Actors in Scotland and Wales placed more emphasis on local planning, equity and community ownership with significant advocacy from community and not-for-profit agencies. In Scotland a LES was described as 'more about the human, social and economic parts of the system' and 'driven by community involvement, participation, ownership, engagement in the energy' (interview 2). This focus on social benefits and community-based networks was evident in key policy documents (Scottish Government, 2017c, 2021b) and common across Scottish central and local government, NGO and advisory organisations (interviews 3,4,5). In Wales the rationales for more localised energy systems were cast as 'less about cost and more about overall economic, social, environmental, cultural value' (interviews 6,7,8,9). A LES was 'an opportunity to potentially address some of the inequalities of the current system' (interview 7). Commitments, such as the Well-Being of Future Generations (Wales) Act 2015, which sets out a range of long-term well-being goals and duties, were invoked as prioritising social equity through LES.

While acknowledging diverse drivers and benefits, interviewees highlighted difficulties in defining, or setting boundaries around, LES components. This interpretive flexibility enables broad coalitions to be mobilised around multiple, fluid conceptions of local energy systems, creating opportunities for shared work to embed LES narratives without agreed policy priorities. Conversely the potential for LES to incorporate distinct policy areas, including community energy, just transitions, or economic development, locates the field at the intersection of multiple existing SAFs making it difficult to mobilise actors around agreed priorities for change.

In England advocacy organisations, including the ADE, UK100, LGA, APSE,[5] were important in arguing for great policy attention on LES. However these organisations have limited resources and either advise local authorities on a range of policy (e.g. LGA, APSE) or represent energy system actors with varying views on LES (e.g. ADE). This resulted in a diversity of opinion on LES policy needs, rather than coordinated persuasion from a tightly knit policy network.

In contrast Wales and Scotland have centrally funded programmes and organisations that form the core of LES networks, with strong inter-organisational connections. In Scotland consortia of public and social enterprise organisations, such as Energy Saving Trust, Change Works, and SCARF, have built long-term relationships with Scottish Government through delivery of support programmes. These networks of organisations were identified as loci of skills and knowledge capital as they are 'all part of the same networks' (interview 14), with 'long-standing good relationships between Scottish Government, these organisations and the

[5] The Association of Decentralised Energy (ADE): the trade association for decentralised energy. UK100: network of local government leaders who have pledged to lead a rapid transition to Net Zero. The Local Government Association (LGA): the national membership body for local authorities. The Association of Public Service Excellence (APSE): a not for profit membership association working with local government.

communities that they serve' (interview 3).

A similar model exists in Wales, with government funded, not-for-profit, agencies delivering LES programmes. The Welsh Energy Service provides technical, commercial and procurement advice and support to the public sector and community organisations (Welsh Government, 2022a). The programme is delivered by a consortium led by Energy Saving Trust and Carbon Trust, supported by Local Partnerships.[6] Wales has fewer support and advocacy organisations than Scotland, and the Welsh Government is taking a more central role in shaping the environment for LES through preparing regional energy plans and initiating local energy plans for all local authority areas.

4.2.1.2. Defining rule structures and resources. Establishing new policy fields requires definition of rules which structure membership, roles, status and norms. Among interviewees, the most commonly discussed rule structures shaping the LES field related to local energy planning. Local energy planning creates structure by formalising a data- and scenario-led approach to local energy systems. Planning approaches vary, but are broadly defined as multi-actor processes which develop options for long-term decarbonisation of energy systems in a locality (Krog and Sperling, 2019; Ofgem, 2019). Advice commissioned by the UK government suggests that good quality local energy planning includes:

- a transparent, independent, consensus-based process that includes all local stakeholders;
- a whole systems approach (across electricity, gas and heat) to understand options and interactions;
- robust local data and evidence at an appropriate scale;
- agreement between different parties of future heating system options across multiple scenarios and agreed next steps in resolving uncertainty.

(Centre for Sustainable Energy and Energy Systems Catapult, 2020).

In Great Britain three distinct approaches to rule structures for local energy system planning have emerged, although all three approaches emphasis interactions between local authorities and DNOs. In England and Wales the Energy Technologies Institute (ETI)/ Energy Systems Catapult (ESC) developed and tested the EnergyPath Networks cost optimisation model, a structured approach to local authority-level energy system planning. Three local authority pilots were developed into a framework for Local Area Energy Planning (LAEP) which, although not mandated, was referenced in the energy regulator business planning guidance for DNOs for the 2023–2028 price control (Ofgem, 2021). The regulator suggested that LAEPs might be utilised to provide evidence for network investment ahead of need, providing a rationale for public investment in assets where there is otherwise a risk of under-utilisation. Ofgem stated however that they 'are not obliging companies to produce LAEPs' (Ofgem, 2019, p. 3). In summer 2023 the Energy Systems Catapult indicated that 66 councils across the UK had undertaken, or were undertaking, Local Area Energy Planning (Energy Systems Catapult, 2023).

Welsh Government has played a central role in structuring rules and resources for local energy planning in Wales (Welsh Government, 2022b), including provision of local authority funding and consultancy support for LAEPs; guidance on integrating energy into Regional Economic Frameworks[7] (Welsh Government, 2020), and a requirement for all Growth Deals to include carbon reduction metrics (Welsh Government, 2021a). The Net Zero Wales strategy committed government to ensuring that 'all areas of Wales have a detailed local energy plan by the end of 2023–24' (Welsh Government, 2021a, p. 64). Previous local energy planning pilots were framed as 'pump priming' a more central role for local authorities through 'providing both the Technical Support and giving them funding to get additional capacity' (interview 10).

In Scotland the rules structures and resources have centred on the concept of Local Heat and Energy Efficiency Strategies (LHEES), which was introduced through two Scottish Government consultations in 2017 (Scottish Government, 2017b, 2017a). LHEES are intended to provide costed and prioritised plans for decarbonising heat and improving energy efficiency in buildings across every local authority area. Rules have been structured around a common methodology and data sets (Scottish Government, 2021a, 2022). These have been derived from collaboration between Scottish Government and local authorities, with resources for every local authority to test methodologies and assessment tools, and funding for support from consultancies and not for profit agencies. Rule structures were formalised in a 2022 statutory order requiring all local authorities to publish a local heat and energy efficiency strategy and delivery plan by the end of 2023. The requirement for LHEES with a standardised methodology, was identified as a 'really important' rule that was legitimising a LES field that goes beyond techno-economic network planning and incorporates social priorities (interview 2).

Reflecting on the varying rules structures and resources for local energy planning across Great Britain, interviewees in England expressed frustration at limited embedding. An English local authority suggested that in Scotland LHEES are coordinated with 'access to national data sets and a consistent methodology, but where on earth is that in England?' (interview 11). Local authorities were consistently identified as the appropriate actors to carry out local energy planning, but in England 'local authorities haven't got the policy drivers or the policy levers to actually make things happen' (interview 12) and there is a 'lack of statutory responsibility or consistent framework' (Interview 11).

[6] Local Partnerships is jointly owned by the Local Government Association, HM Treasury and the Welsh Government and supports the public sector on policy challenges, including energy and climate.

[7] The regional economic development strategies which local authorities and other actors prepare.

Formalisation of local energy planning rule structures was supported by DNOs across GB as a means to increase resources. Draft business plans[8] were described as 'massively resourcing support for local area energy planning' (interview 21). They suggested however that Ofgem needed to 'acknowledge the size of the task' (interview 12), with many local authorities lacking 'the skill set,..the people,..the mandate' (interview 12). A second DNO suggested a need to mandate local area energy plans and 'provide the resources and the requirements to support those processes from the incumbent' (interview 13).

Scottish and Welsh Government officers emphasised that the relevant DNOs had included provision to engage with local energy planning through the more institutionalised approach to LAEP and LHEES in the devolved nations. In Scotland, DNOs and Government worked to influence Ofgem to make resource provisions in DNO business plans for local authority support, with the DNOs having to 'work quite hard to get their ED2 business plans aligned with the ambition on heat in Scotland' (interview 3). Joint working between Scottish Government and DNOs to establish a LES SAF was demonstrated by the Scottish Energy Networks Strategic Leadership Group[9] (Scottish Government, 2021d). The group produced joint principles for Scottish Network Development 'in order that Ofgem had something to point to say that the Scottish case is distinct and therefore that the two Scottish DNOs need to be able to put in their business plans things that others might not need to, and that are justifiably funded through customer bills' (interview 3). Similarly, in Wales, both DNO 'plans have got reference to the work that we're doing in Wales and proposing that they resource themselves in order to be able to engage with that' (interview 6). In both Scotland and Wales devolved governments and DNOs articulated a shared normative perspective on the need to integrate DNO planning and local energy planning, with devolved governments expecting to gain from increased and faster network investment in their area, and DNOs gaining from increased flexibility in regulatory price controls. These collaborations served to create normative assumptions about the need to resource greater inter-organisational connections between DNOs and local authorities to address local capacity challenges.

In all three jurisdictions it was recognised that both DNOs and local authorities were critical socio-technical network builders for any LES SAF. DNOs hold network data, 'basically control what gets on the network' (interview 15), and are hubs of significant innovation funding. In contrast local authorities were acknowledged to have limited resources or formal powers for local energy systems development, but were regarded as critical holders of soft power relating to convening local stakeholders, providing democratic legitimacy, and developing spatial planning.

In terms of formal financial resources, the local authority role in England was described as constrained by short term LES funding which undermines ability for strategic planning because 'they end up chasing funding' (interview 16). Local authorities, DNOs and advisory organisations suggested Government funded-innovation programmes played an influential role in shaping LES, emphasising experimentation through energy network innovation competitions managed by Ofgem and the 2018–2023 Innovate UK Prospering from the Energy Revolution (PFER) programme. The latter allocated £102.5 m to 25 projects to accelerate innovation in smart local energy systems (interviews 12, 16). Actors across all three jurisdictions also emphasised the importance of rule structures for accessing finance, referencing the UK Infrastructure Bank, the Development Bank of Wales and the Scottish National Investment Bank, all of which have objectives to contribute to net zero. However, the development of schemes to support LES investment was perceived to be slow.

4.2.2. Institutional work to maintain existing SAFs

Maintenance of existing SAFs was taking place through a variety of forms of institutional work, with *enabling* and *embedding* the most evident. Both of these relate predominantly to the obduracy of the centralised energy systems policy field and demonstrate how rules which maintain the status quo can be deeply *routinized and embedded* in norms and practices. Similarly the lack of devolved powers over many energy system functions *deterred* LES development, acting as a hard barrier for devolved and local governments, who responded by using LES discourses to further wider debate about political decentralisation of powers and resources.

4.2.2.1. Enabling and embedding. In the context of maintaining existing SAFs *enabling* refers to work to 'facilitate, supplement and support institutions' (Lawrence and Suddaby, 2006, p. 230) beneficial to the status quo. This can include diverting resources to incumbent interests, or creating intermediaries to act as coercive barriers to challengers.

Despite evidence of distinct LES policy fields being developed in England, Scotland and Wales, the embedding of the LES SAF was limited in all three locations by existing governance units. Specifically, preservation of SAFs geared to centralised structures, norms and rules within UK Government and Ofgem has the effect of marginalising local energy systems, with 'lots of practices and systems and behaviours and regulations and so on that are designed to service that large centralised approach' (interview 12). Regulatory barriers to innovative LES business models and local trading are perceived as particularly challenging and presenting 'fundamental constraints'. Additionally, the techno-economic approach prioritised by UK government was perceived as embedding cultural and technocratic institutions which worked as barriers to more localised systems: 'if you were to ask Treasury, BEIS or Ofgem, "Do you think there's strong benefits to taking a local approach?" I think they'd say no…. it's hard-wired into stuff, for example the models… this stuff is quantitative as well as cultural' (interview 17).

Innovation processes were also perceived as preserving incumbent actor positions. Considerable funding is available to network companies via Ofgem- or UKRI-led innovation competitions. These funds often require cross-sector consortia, but local authorities and advisory organisations were sceptical as to whether this involvement was meaningful. Whilst there was considerable support for

[8] The electricity distribution price control period being negotiated in Great Britain at the time of interviews was RIIO ED2 which runs from 2023 to 2028.

[9] The group includes the Scottish Government, gas and electricity network companies and Ofgem.

network businesses playing a central role in new approaches to system optimisation, much of the learning from innovation projects was described as 'controlled' by incumbent energy companies (interview 11), further routinizing their role as holders of industry knowledge.

As discussed, while social skill is important in bringing LES actors together in enabling and embedding a SAF, there are considerable resource dependencies, particularly local authorities depending on data and skills from DNOs to conduct planning. Ultimately DNOs and local authorities operate under different institutional structures and have different obligations (DNOs to shareholders and LAs to citizens). This was demonstrated through DNOs emphasising electricity network investment over the short-term; 'we're focusing on the next 10 years…[local authorities] need to focus on EVs now' (interview 12). Overall DNOs are in an ambiguous role, their core interest relates to electrification and this is not necessarily aligned with enabling other local energy system actors to take a more central role. However they're aware that they need to engage with local whole system approaches to avoid being sanctioned for blocking innovations needed for system integration.

4.2.2.2. Deterring and interfield relations. Institutional work to deter challenger organisations was also evident in devolved actors describing difficulty in influencing GB-wide policies. The lack of devolved powers over energy supply, regulation and governance was described as 'the obvious big blocker', acting as a coercive barrier to any LES SAF, with the Welsh Government lacking 'agency in terms of regulatory space or market mechanisms' (interview 19). Equally the ability of Scotland to realise its LES ambitions was described as subject to 'fundamental constraints, as…energy markets are all governed from Westminster' (interview 3).

For a challenger SAF to become influential, governing units need to shift away from incumbents. This is difficult for LES SAFs as they exist at an inter-field space between two proximate high level fields. First, the centralised energy system field, which is populated by a wide range of highly resourced incumbents. Secondly, the broader local governance field which is concerned with multi-level governance and the relationships between UK Government and devolved and local structures. Both higher level proximate fields are well-established and the complexity of existing governance structures acts to slow down and deter contestation. As described by a local authority in England, local and regional governance is 'a very unstable landscape' (interview 20) with work to embed a LES SAF in England taking place in the context of limited devolution from Westminister (Sandford, 2016).

In Wales the government was more directive about new rules and resources for local energy planning, and multi-level governance institutions were in place to facilitate LES with '22 local authorities,…four growth deals,…joint committees. All of them will have energy responsibilities' (interview 19). The need to coordinate these structures was recognised, with commitment to a regionally planned, rather than a top down, approach.

4.2.3. Disrupting institutions

Whilst there was evidence of strategic action to create LES SAFs across GB, there was much less evidence of institutional work to disrupt existing, competing SAFs, particularly those relating to centralised energy systems and engineering based system planning.

In all three jurisdictions, and most clearly in England, '*disrupting*' could be seen in a focus on experimental learning through LES 'projects'. There is however limited clarity about how such learning would be a disruptive force, notably in exerting influence over either government policy decisions or the practices of international energy and digital infrastructure companies whose corporate priorities are inscribed in complex metrics and value structures. The emphasis on 'projectification' of experiments can limit the ability of innovations to undermine the moral foundation of existing practices and rules as learning tends to be depoliticised and focus on incrementalism (Torrens and von Wirth, 2021). Limited resources are available to LES actors, although there is some evidence of the reconfiguring of rewards through the regulatory requirement on electricity and gas distribution businesses to engage with local actors in investment planning. It is as yet unclear whether or how this will have material impacts on investment decisions.

In Scotland and Wales a range of actors were seeking to disrupt the current centralised energy SAF through emphasising the poor social outcomes achieved by the 'current system' for the people of Scotland and Wales. These efforts to undermine the moral foundation of existing energy system norms were somewhat effective in those jurisdictions in that they were associated with the development of policies to support a stronger focus on equity and fairness. However these narratives were aligned with the prevailing political values and beliefs in Scotland and Wales and there was little evidence of impact in England.

In Scotland efforts to disrupt existing centralised and efficient energy system norms were evident in efforts to connect the LES SAF with social justice through rules for LHEES, in establishment of Heat and Energy Efficiency Scotland (a National Energy Agency) and in publication of a joint Energy Strategy and Just Transition Plan (The Scottish Government, 2023). At the interface between energy system SAFs and those governing the distribution of powers and resources in the UK, the Scottish Government also sought to situate a LES SAF in wider debates on devolution. A Government interviewee stated that 'this isn't about Scotland. This is about devolved government and its role in determining policy outcomes or setting the agenda. And then it's also about local government and regional government' (interview 3). This commentary on inter-field relations does not, however, articulate how devolution of powers from Scottish Government to local authorities could also be instrumental in delivering a LES SAF and underplays known tensions over the resourcing and powers of local government (Mitchell, 2019; Scottish Parliament Net Zero Energy and Transport Committee, 2023).

5. Discussion

Our study analyses the social processes involved in the development of a 'local energy systems' policy field in Britain. Analysis of institutional work is applied to understand how actors were negotiating legitimate action and encoding shared meaning systems in institutions in England, Scotland and Wales.

LES fields in England, Scotland and Wales can best be described as 'in development' with significant uncertainties and a lack of embedding in British energy system institutions. A wide range of cross sector actors are participating in advocacy for integrated local energy systems, and there is some evidence of a shared understanding of the purpose of LES. Local energy planning was emphasised as an important emerging rule structure which was beginning to create new interactions between local authorities and electricity network operators. However, these 'in development' SAFs are also being constituted differently in England, Scotland and Wales.

In England, the Government, regulator and innovation agencies had most influence in structuring a LES field focussed on flexibility business models and distribution network innovation. Whilst local authorities were increasingly being defined as important LES actors, they had limited advocacy power, and lacked rule systems to structure their local energy identity. In Scotland, and to lesser extent Wales, LES advocacy networks were broader and more established. This supported a wider framing of LES benefits with emphasis on social outcomes and community involvement.

Clearer multi-level governance relationships in Scotland (and to some extent Wales) supported institutional development; this included constructing rule systems for local energy planning, and the development of national structures that support LES (Heat and Energy Efficiency Scotland and the Local Energy policy statement). Institutional plurality has been thought to increase opportunities for transformative agency as it broadens the scope for legitimate actions (Fuenfschilling and Truffer, 2016; Lenhart et al., 2020). Our analysis indicates that this transformative agency is however constrained by established energy system structures and the limited influence devolved governments have over electricity and gas regulation and markets controlled by UK Government. Overall the three jurisdictions lacked an actor or coalition with autonomous potential to shift energy system rules and investment in favour of LES. Whilst institutional work to *define* and *advocate* for LES was evident, the lack of decentralised governance structures (both to Scottish and Welsh Governments and to local and regional authorities), and maintenance of a centralised energy system logic, limited LES *embedding*. In Scotland and Wales this resulted in devolved governments taking strategic action in areas where it is most viable and aligned with their powers, in this case heat in buildings.

Electricity Distribution Network Operators were also occupying a complex position in the emerging LES field, acting to both maintain existing field logics and promote challenger LES framings. DNOs emphasised a role for local authorities in energy planning but framed this in relation to increasing electricity network investment, rather than a whole system approach. They also prioritised an experimental approach with limited change to broader rules and norms. This highlights the complex roles that actors can play as both challenger and incumbent. There is growing analysis of the equivocal role incumbents can play in transitions (Kungl, 2015; Galeano Galvan, Cuppen and Taanman, 2020; Friedrich et al., 2023), but our contribution reveals that unexpected organisations can emerge as skilful challenger actors. Specifically Scottish and Welsh Governments were undertaking advocacy and creating LES networks and identities, partly as a response to their broader drivers to carve out distinct devolved policy approaches and advocate for more powers. In contrast, the UK Government was themselves a key incumbent, deeply embedded in the rules and norms of the centralised system and resistant to decentralising powers from Westminster.

Other analyses of institutional work often focus on institutional entrepreneurship. Much of this literature emphasises the role of single 'heroic' entrepreneurial actors or organisations, but recent work has increasingly recognised the diffuse and collective actions that comprise entrepreneurship (Heiskanen et al., 2019; Hoogstraaten et al., 2020; Löhr et al., 2022). We advocate that focussing on institutional work within strategic action fields enables a more detailed account of this collective action; focussing on how actors construct opportunity space, mobilise resources and undertake innovative action to violate old, and create new, rules. In addition, it foregrounds the significance of inter-field relations, as exemplified in the important role multi-level governance structures were playing in processes of both LES SAF creation and the maintenance of existing SAFs.

Notwithstanding the ability of institutional work analysis to add detail to the 'social skill' SAF label, the practicalities of applying such categorisations are complex. The discrete classification of the diverse and indeterminate social processes taking place as actors seek to continually (re)shape and (re)form fields is somewhat artificial and the 'work' undertaken in each category overlaps and interacts with other categories. For example, much of our commentary on maintenance of existing institutions actually refers to the challenges of creating new LES SAFs, in the context of the existing centralised energy system SAF. This demonstrates how institutional work often occurs at 'encounters' between existing and challenger SAFs, as well as with proximate fields. Further research following institutional work across time and in different context could extend understanding of how these encounters between SAFs impact on processes of maintenance and disruption.

6. Conclusion

Findings demonstrate the development of LES policy action fields across England, Scotland and Wales. The construction of LES *identities, rationales and networks* were important in creating persuasive power for local governments, NGOs, and DNOs to *advocate* for the importance of LES. Despite this, efforts to institutionalise LES more fully through *defining* rules around local energy planning were more contested. Even in Scotland and Wales where formal rules are established, the resourcing of local authorities and the connection of local planning to distribution network investment remained unclear. This *creative* institutional work therefore can be described as taking place 'at the margins' of the centralised system with limited *disruption* of norms and rules and *maintenance* of centralised systems of regulation and techno-economic assessment. Disruption was more evident in Scotland and Wales where there was strategic action to undermine the *moral foundations* of the centralised system and more structuring of localised energy planning *rules*. Efforts at *disruption* were often in the form of experiments to test new practices and approaches, which are often controlled by incumbents and subject to considerable resource dependencies.

Our analysis provides three conclusions for SAF theory and sustainability transitions. First, the countervailing power of governments is significant when established rules, regulation and technological systems are being challenged, or in a degree of flux (Silvester

and Fisker, 2023). Considerable distributed generation is already connected to GB electricity networks (National Grid ESO, 2022) and digitalisation of energy systems is progressing (Energy Systems Catapult, 2021). LES propositions however remain relatively peripheral for the UK Government. The obduracy of legacy centralised infrastructures and institutions is a powerful force in blocking new sustainable energy SAFs. The norms and institutions of the current energy system were honed and refined in relation to fossil fuel economics and large-scale generation. While there is institutional work in Scotland and Wales to create LES SAFs this is constrained by a lack of formal powers, the persistence of a 'GB single market' and market economics which remain tied to centralised generation.

Secondly, actors often have shifting identities acting as creators, disruptors or incumbents depending on context and what is projected onto them by other parties. DNOs are fulfilling complex roles advocating for more local, whole system energy planning but also maintaining their position as a key techno-economic interface between local and central systems.

Finally, we demonstrate the importance of field overlaps as sites of strategic action. Contrary to the expectation that institutional change is more likely at field overlaps, proximate fields can act to block the formation of rule structures in one field where they conflict with norms or rules in an overlapping field. For example local energy planning is located at the intersection of LES and broader local governance policy fields but was constrained in England by limited devolution of powers to local and regional governments. Conversely devolved governments in Scotland and Wales were seeking to use LES debates to develop conversations about the need for further devolution, emphasising how limited powers over energy regulation were constraining Scottish and Welsh climate action, in turn damaging UK capacity to meet legislated carbon budgets. This demonstrates how the emerging LES field is entangled with wider struggles over local governance roles in net zero (Committee on Climate Change, 2020; National Audit Office, 2021; Scottish Parliament Net Zero Energy and Transport Committee, 2023).

Löhr et al. (2022) identify that analyses of institutional work can shed light on the interaction between actors and institutionalisation processes. We go further by specifically taking a SAF informed approach which takes account of the complexities of challenge/incumbent roles and of strategic action in an interfield matrix. When action to create LES SAFs is considered in relation to the positioning and mobilisation of other fields it becomes clear how new fields can be blocked by action in proximate (or overlapping) fields. In our case, lack of clarity in the multi-level governance structures of GB has acted to limit the embedding of LES SAFs. Cross-sector actors were considering the relationships required across levels of the state, industry and local organisations in order to deliver equitable LES. However, agency to engage the UK government in these debates was limited. The development of LES SAFs must also be seen in the context of continuing erosion of local government through austerity and outsourcing. In this regard, some propositions about net zero duties and LES can be framed as 'pawns in the game' of negotiating more powers locally. Whilst some local areas lobby for a strengthened role in climate governance (UK100, 2022), outside major cities it is unclear whether there is an appetite for more local governance of net zero, creating questions about the long-term trajectory of LES SAFs.

The analysis in this paper focussed on the 'live' development of LES SAF institutions, with many relationships and programmes still under development or nascent. There are considerable uncertainties about the material impact of the emerging differential local energy system SAFs across England, Scotland and Wales. As the structures for, and delivery of, LES are established the differences are likely to provide lessons about both the potential for fragile policy SAFs to become established and the relationship between new policy fields and material outcomes.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eist.2023.100789.

Appendix

Appendix A: Interviewees by type

Interviewee number	Organisation
1	UK Government
2	Scottish Government
3	Local Government - Scotland
4	NGO - Scotland
5	Advisory organisation - Scotland
6	Welsh Government
7	NGO - Wales
8	Local Authority - Wales
9	Community Energy organisation
10	Welsh Government
11	Local Authority - England
12	DNO - England
13	DNO - Scotland
14	Advisory organisation - Scotland
15	NGO
16	Non-departmental public body
17	Advisory organisation
18	Local Authority - England
19	NGO - Wales
20	Local Authority - England
21	Academic

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