



Spatial imaginaries underpin community objections to shale gas exploration in the UK

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ABSTRACT

Spatial imaginaries refer to collective understandings of socio-spatial relations that encompass three types: imaginaries about specific places in the world, generic types of space (e.g. a rural village), and transformations to space (e.g. industrialisation). The concept has been applied in diverse fields, notably city and regional planning, yet significant gaps remain in terms of understanding interdependencies between types of spatial imaginary at multiple scales, and of the fairness and justice implications of contested imaginaries, particularly in contexts of low carbon energy transitions. To address these gaps, we draw on qualitative data from 45 interviews with residents in two UK communities—Great Altcar and Woodsetts—to analyse arguments about proposals for local shale gas exploration. We highlight three key findings. First, objections are underpinned by the three types of spatial imaginary, which are used relationally to contest local proposals. We demonstrate the distinction, consistencies and contradictions across the types of spatial imaginaries in practice. Second, the spatial imaginaries create particular sets of ‘othering’, in terms of where residents believe fracking should or should not occur, which build upon distinctions between city and countryside, locals and ‘outsiders’, the north and south of England, and internationally between Great Britain and other countries. Finally, concerns with fairness and justice underpin how spatial imaginaries are used to object to local fracking proposals. By recognising community-level concerns with energy infrastructure projects, in the form of diverse spatial imaginaries at multiple scales, we can move toward more inclusive approaches to sustainable energy transitions.

1. Introduction

Global low carbon energy transitions are underway as countries seek to reduce the use of fossil-fuels and shift towards renewable energy sources in an effort to mitigate the impacts of climate change. New energy infrastructures and resource extraction have significant environmental and social impacts, leading geographers to argue that spatiality is a crucial, yet understudied component of low carbon energy transitions (Bridge et al., 2013; Calvert, 2016; Castán Broto and Baker, 2018; Baka and Vaishnav, 2020). For example, the deployment of low carbon energy technologies has uneven spatial trajectories across localities, regions and countries, and to fully understand those spatial dynamics,

geographical concepts and methods can play a significant role.

Low carbon energy projects are different from other kinds of potential locally unwanted land uses (LULUs) as they have significant non-local and multiscale consequences associated with climate change. In the current climate crisis, calls for swift transitions in energy sources mean there is a further incentive to scale up deployment of low carbon energy technologies with temporal urgency. The speed and degree to which this transition is successful will depend, in part, on how host communities react to, oppose or accept potential place changes tied to energy infrastructure projects. As a result, understanding local community responses to energy infrastructure proposals becomes an issue of local, national and global importance.

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Understanding why communities might object to new developments, including energy projects, has been a longstanding topic of research in geography as well as other social sciences, captured by the concept of NIMBYism (Not In My Back Yard) (DeVerteuil, 2013), Devine-Wright, 2005) and alternative approaches such as social acceptance (Wüstenhagen et al., 2007; Wolsink, 2020). Further, since a multitude of concepts have been used across geography and cognate disciplines to understand people–place relations and responses to place change (e.g. place frames, place attachment, sense of place, spatial imaginaries, NIMBY), and since these concepts are often treated ambiguously in research (e.g. Benner, 2025), the application of geographical concepts to understand community responses to energy projects can make broader contributions to disciplinary debates.

We propose that the concept of spatial imaginaries offers a hitherto under-utilised yet potentially useful approach to understand the socio-spatial dynamics of energy transitions, specifically how host communities make sense of developer-led technology proposals. This is because spatial imaginaries are multi-dimensional, encompassing place-specific, but also spatially generic and transformative aspects of people–place relations (Watkins, 2015). Spatial imaginaries are “deeply held, collective understanding of socio-spatial relations that are performed by, give sense to, make possible and change collective socio-spatial practices” (Davoudi et al., 2018, p101).

Yet, there are a number of gaps that this research seeks to address. First, precise understanding of what is meant by ‘imaginaries’, particularly their temporal dimensions, remains elusive and risks under-appreciating geographical understandings of sustainability transitions (Benner, 2025). Second, comparatively few empirical studies have utilised all three types of spatial imaginaries identified by Watkins (2015), despite longstanding calls for systemic, multidimensional analyses of sociospatial relations (Jessop et al., 2008). This is a significant gap, as understanding the interdependencies between types of spatial imaginary can only arise from multidimensional analyses. Finally, although an emerging literature has begun to research the roles played by spatial imaginaries in relation to climate change and low carbon energy transitions (e.g. Arnall and Hilson, 2023; Lambert, 2022; Hine et al., 2024), few studies to date have drawn upon spatial imaginaries to understand the responses of host communities to energy infrastructure proposals, specifically shale gas.

Aiming to address these gaps, we investigate the roles played by spatial imaginaries to understand how host communities make sense of proposed shale gas extraction in the UK. We draw on qualitative data from two case study communities —Great Altcar and Woodsetts— to ask the following research questions:

1. What spatial imaginaries are drawn upon by host communities who resist proposed shale gas projects?
2. How is ‘othering’ deployed as a strategy to formalise spatial imaginaries and contest project proposals?
3. To what extent are multiple spatial scales, from local to international, embedded in diverse forms of spatial imaginary?

Addressing these questions can advance geographical understandings of processes of meaning-making around place change generally, and energy transitions more specifically. Furthermore, we contend that such work can potentially inform fair and inclusive approaches for envisioning and enacting energy transitions that reflect communities’ desired futures and their relationships with place. In the following section we review literature on community responses to energy infrastructure proposals, place-based approaches to local energy conflicts and how spatial imaginaries can inform research in this domain.

2. Spatial dimensions of community responses to place change arising from energy infrastructure projects

Energy transitions are spatial as well as socio-technical phenomena (Bridge et al., 2013; Castán Broto and Baker, 2018) producing uneven consequences at local, regional, national and global scales. Varied patterns of resource availability can lead to new energy projects being proposed close to communities that are more accustomed to ‘out of sight, out of mind’ energy systems (Pasqualetti, 2000). Since the extraction, distribution and use of energy resources involves large-scale infrastructures (e.g. wind turbines, drilling rigs or electricity pylons), energy projects can have significant local impacts and often lead to community objections (Pidgeon and Demski, 2012). Such objections – commonly understood as ‘NIMBYism’ (Not In My Back Yard) – underscore how energy transitions implicate wider issues of place change and place-making that have been an enduring concern of geographers, as well as researchers in cognate disciplines such as planning and environmental psychology (e.g. Massey, 2005; Pasqualetti, 2000; Pierce et al., 2011).

NIMBYism has been a predominant discourse used to explain community objections to a broad range of siting proposals from social housing to wind farms (Wolsink, 2005; DeVerteuil, 2013), depicting objectors as ignorant, selfish and irrational (Burningham, 2000; Burningham et al., 2015). NIMBYism is a spatial concept, underpinned by the assumption that objectors are insular in outlook and preferring unwanted developments to be sited anywhere else but in their immediate locality (DeVerteuil, 2013). NIMBY discourse has been influential in research on energy transitions, for example leading to studies that put a central emphasis upon spatial proximity, assuming that those living closest to energy projects are most likely to object (e.g. Swofford and Slattery, 2010). However, following concerns that the NIMBY concept was both inaccurate and pejorative (Burningham, 2000; Devine-Wright, 2005; Wolsink, 2005), researchers have searched for alternative approaches to understand community objections to place change proposals. Geographical concepts of place and space have been a longstanding feature of subsequent literature.

Devine-Wright (2009), Devine-Wright (2011a), Devine-Wright (2011b) proposed a re-framing of NIMBYism as ‘place-protective action’, understanding community responses to unwanted energy projects by drawing on literature on people–place relations, specifically the concepts of place attachment (emotional, typically positive bonds that individuals hold with particular places, Altman and Low, 1992) and place identity (place-related components of the self-concept, Proshansky et al., 1983). Conceptually, this approach begins with the assumption that community objections arise when proposals for place change are interpreted as disrupting pre-existing attachments to place (Brown and Perkins, 1992) and threatening place identities (Twigger-Ross and Uzzell, 1996). This approach has received empirical support in technological contexts involving hydropower, offshore wind energy, tidal energy and power lines (e.g. Vorkinn and Riese, 2001; Devine-Wright and Howes, 2010; Devine-Wright, 2013). Such studies show that people with strong place attachments are more likely to object when technology proposals are interpreted by residents to be ‘out of place’ (Cresswell, 2003).

Despite these contributions, approaches founded upon place attachment and place identity have some limitations. Like much literature that has criticised NIMBYism, this approach remains predominantly focused upon explaining objections (Batel, 2020a, Batel, 2020b), even if there is some evidence that people who are strongly attached to a place will support energy proposals if they are seen as enhancing local distinctiveness (Devine-Wright, 2011b). Second, this approach represents a rather individualistic way of understanding energy conflicts,

presuming that community responses can be understood via individual level, psychological processes (e.g. Scannell and Gifford, 2010). Finally, it is relatively opaque regarding the politics of place change, for example power asymmetries between host communities and developers, and their implications for fairness in energy transitions (Jenkins et al., 2016).

Other lines of place-based research applied to energy contexts have adopted meaning-oriented approaches, notably concepts of ‘sense of place’ (meanings associated with a given location in the world, encompassing both socially constructed and material dimensions, Tuan, 1977; Cresswell, 2003) and ‘place-technology fit’ (relations between the meanings associated with a place and the meanings associated with a given technology, McLachlan, 2009; Devine-Wright and Wiersma, 2019). For example, Venables et al. (2012) investigated community attitudes to potential new nuclear power plants sited close to existing plants. They found that residents who incorporated the existing nuclear power plant into their sense of place – considering the power plant as a ‘normal’ part of the fabric of the place – were significantly more likely to express support for a new nuclear plant in the vicinity. Focusing on ‘place-technology fit’, McLachlan (2009) studied the ‘symbolic logics’ relating meanings of place and technology that were said to underpin local actors’ supportive or objecting discourses. Findings show that representing a wave energy project as ‘pioneering’ and viewing the place as a ‘locational resource to be exploited’ was associated with supportive beliefs, while viewing the same project as ‘experimental’ and the place as ‘natural’ characterised objecting beliefs.

While both of these concepts are helpful to understand support and objections in terms of congruence or contradiction between place and technology meanings, there remain some weaknesses in their ability to fully explain the spatial complexities of community responses to energy projects. For example, both sense of place and place-technology fit arguably underplay dynamics of place change in localities impacted by large-scale energy infrastructures. For example, beliefs about types of place change, notably concerns about ‘industrialisation’ of the countryside, have surfaced in much research on energy proposals, characterising such technologies as ‘alien’ in rural or coastal settings (Woods, 2003; Ellis et al., 2007).

A contrasting approach to place change features in research in economic geography and sustainability transitions (e.g. Pierce et al., 2011; Van Neste and Martin, 2018; Feola et al., 2023). Here, action on sustainable development is viewed as embedded in particular places in the world, hence characterised as a process of place-making that is inherently political, involving multiple actors in relational networks of power (Pierce et al., 2011). To achieve place change, actors coalesce around the creation and sharing of particular visions or imaginaries of place futures, referred to as place frames. For example, Van Neste and Martin (2018) identified multiple place frames in argumentation over the future of Montreal, Canada, specifically contested discourses concerning the status of the car in debates over urban mobilities and health. While the place frame approach appropriately draws attention to the politics of contestation in how places are imagined, nevertheless this approach is predominantly ‘localist’ in putting primary emphasis upon place meanings. As a consequence, it has relatively little to say about the role of shared meanings about generic types of spaces (e.g. the countryside or the city) in contexts of place change. Yet research has identified ways that broader socio-cultural ideas, such as viewing the countryside as either a ‘rural idyll’ or a space of production (Woods, 2003) are significant in argumentation over the siting of infrastructures such as wind farms and electricity pylons (Haggett, 2008; Batel and Devine-Wright, 2017).

To address these gaps, we propose the concept of spatial imaginaries to capture the complexities of community responses to place change arising from energy transitions, specifically shale gas proposals. The key advantage of spatial imaginaries is a combining of place-specific as well as generic and transformative dimensions of meanings surrounding instances of place change. In doing so, we contend that spatial imaginaries

provide a versatility and multidimensionality that solely place-based approaches lack. Moreover, attention to different types of spatial imaginary addresses longstanding calls for polymorphy in sociospatial research, avoiding the weaknesses inherent in single dimension approaches (e.g. a focus on either place or space; Jessop et al., 2008).

Spatial imaginaries (sometimes referred to as ‘geographical imaginaries’, Said, 1978) are “stories and ways of talking about places and spaces that transcend language as embodied performances by people in the material world” (Watkins, 2015: 509). Spatial imaginaries are ‘background understandings’ in the sense that they provide taken-for-granted assumptions about space, are emergent, infused with power relations and collective (Davoudi et al., 2018). They serve as mediums through which to move “ideas, arguments, and consequential ‘otherings’ across space and time” (Watkins, *ibid*, 511). These ‘otherings’, which refer to hierarchal, normalised and relational beliefs that “certain people, places, or ideas are naturally different and unequal” (Sharp, 2022:11-12), can result in generalisations about what is inside or outside imagined boundaries (Watkins, *ibid*). Moreover, spatial imaginaries are performative, in the sense that they have material consequences for the fabric of places, as well as signalling how collective understandings are forged through active, embodied engagement with place in the lived experience of everyday life.

We use Watkins’ (2015) framework identifying three types of spatial imaginaries: imaginaries of place, imaginaries of idealized spaces, and imaginaries of spatial transformations. Watkins identifies place imaginaries as the ideas collectively held about the characteristics of unique places in the world, for example ‘London’ or ‘Siberia’, while idealized space imaginaries refer to meanings associated with generic or archetypal spaces, such as ‘the countryside’ or ‘the city’ (Watkins, 2015). A third type of spatial imaginary refers to spatial transformations, focusing on the processes through which space and place might be changed (e.g. globalisation, gentrification, industrialisation). Taken together, these types of spatial imaginaries tell “a different type of spatial story”, can be complementary or contradictory, and are intertwined across space and scale (Watkins 2015:512).

Spatial imaginaries have been applied in diverse fields of inquiry, particularly spatial and city planning (Arnold et al., 2024; Davoudi et al., 2018; O’Brien, 2025) as well as geopolitics (Sykes, 2018); education (Brooks and Rensimer, 2025), sustainability transitions (Benner, 2025) and disaster studies (Donovan et al., 2024). In relation to climate change, Arnall and Hilson (2023) drew on spatial imaginaries to understand how a community responded to the threat of sea level rise and coastal inundation, specifically contestation between government and community actors over transformation imaginaries and place futures.

Energy studies have also begun to draw on the concept. For example, both Chateau et al. (2021) and Lambert (2022) examine the interplay of place and socio-technical imaginaries in the context of energy transitions, and specifically geothermal development in the US (Lambert, *ibid*). Hine et al. (2024) used spatial imaginaries to understand the discursive and material politics of creating regions in Australia designated as ‘green hydrogen hubs’ by state and private sector actors. Peacock and Devine-Wright (2025) showed how regional spatial imaginaries are influential in shaping national trajectories of low carbon energy technology deployment in Sweden, and are relationally entwined with ‘imagined publics’ associated with particular regional places (e.g. host communities in Northern Sweden). While these empirical studies are notable for capturing spatial imaginaries at multiple scales and indicating how imaginaries of place and technology inter-relate, nevertheless they overlook the value of a multidimensional approach that captures all three types of spatial imaginaries to understand locally contested energy proposals.

We contend that doing so also helps to contribute to broader aspects of the literature on spatial imaginaries. For example, Benner (2025) highlights some confusion and ambiguity in the approaches to imaginaries adopted in sustainability transitions research, while calling for future research to adopt more temporally nuanced approaches that take

account of past as well as future meanings of place and space. Moreover, we propose that a focus on the politics of place change can also help to understand the fairness and justice implications of political contestation over energy transitions (Jenkins et al., 2016), specifically developer-led, state mandated technology deployment and host community experiences.

This research agenda is especially valuable in the context of controversy worldwide about shale gas extraction, which supporters maintain could act as a 'bridge fuel' for the low carbon transition, while enhancing national energy sovereignty, despite concerns about localized ecological and health impacts (Bradshaw et al., 2022). Existing place-based research on shale gas has highlighted concerns about how it might impact place distinctiveness (Willow et al., 2014) and transform both place and place-based identity in the US (Jacquet, 2013; Sangar-amoorthy et al., 2016). Junod et al. (2018) extend this research, demonstrating that where risks to place were lower, residents held more positive attitudes about shale gas development. In Canada, place-based research on energy generally and shale gas specifically shows competing understandings of place and the tensions this can create between supporters and those who oppose the practice (Smith and Tidwell, 2016). For example, in oil-heavy Alberta, Davidson (2018) found that environmental degradation caused by shale gas development leads to place changes that create community trauma (Davidson 2017). Finally, a collection of studies has explored localized impacts and the lived experiences of people facing shale gas development (Perry, 2012; Ladd, 2018; Short and Szolucha, 2019; Sovacool et al., 2020; Ryder and Devine-Wright, 2021; Ryder et al., 2023). While several of these studies pay attention to place change and local impacts, shale gas research has yet to explore how residents in proposed shale gas communities think about place change in relation to local and non-local places, imaginaries of generic spaces, and how the anticipation of proposed shale gas exploration might produce negative visions of community futures rooted in fears of spatial transformation.

Taking these points into account, we aim to advance understanding in three specific ways. First, we contribute to literature on the role of spatial imaginaries in contexts of place change, in particular interdependencies between the three types of spatial imaginary, how these might be 'othered' in relation to each other, and play out at multiple scales. Second, we apply ideas of spatial imaginaries to better understand dynamics of local conflict around the siting of energy projects, specifically shale gas, and how argumentation might feature local and non-local places, types of spaces and spatial transformations. Finally, we discuss lessons that can be learned for fair and inclusive technology deployment practices as part of wider energy transitions.

3. Methodology

Qualitative methods such as case studies are appropriate for research focused on lived experiences (Marshall and Rossman, 2016). Through a combination of multiple qualitative methods, including interviews and participant observation, we illustrate how spatial imaginaries, which can be revealed through discourses about transitions in rural communities (Stokowski et al. 2021), inform expressed individual and shared concerns about how proposed shale gas projects would alter the futures of the case study community. First, participant observation, in both in-person meetings and virtual community spaces, provided opportunities to observe how residents in opposition groups worked to tailor and refine shared messaging, as well as to mobilize resources to support their lines of argumentation (for example, hiring an independent sound expert to challenge developer sound testing).

One-on-one interviews provided an opportunity for community members to share with us what they had expressed at public meetings and consultations and to describe with more depth the underlying concerns that informed their community-based collective action. One person even read their public statement back to us. The interview guide (see Appendix A) was designed in part to elicit information from

residents about how they participated in activities and mobilizations in opposition to the projects. Interviews allowed us to ask for more detail about how participants thought the proposed projects would change their community in the future. In addition to traditional interview formats, five interviews took a more embodied form, where we walked or drove around the fields where the sites were proposed, and also toured farms and backyards. While we always envisioned doing these interactive interviews to better understand people-place connections, we did not develop the approach with the performative nature of spatial imaginaries in mind at the time. Still, it was useful for better understanding the importance of this approach. There were also constraints on this approach as it was not always possible for a variety of reasons: the impact of COVID-19 on data collection, conducting interviews with people that have different levels of mobilities, and simply interviewee preference. Through observations of shared concerns expressed in public spaces and discussions within interviews about motivations for actions and involvement with opposition groups, we note a high level of congruence in responses that suggest residents' collective understandings of their communities and their connections informed shared spatial imaginaries that shaped their responses to the proposed shale gas projects.

Our focus on the two case communities described here—Woodsetts and Great Altcar—stem from a larger project where we study public perceptions of shale gas via mixed-methods research (see Devine-Wright et al., 2021; Whitmarsh et al., 2025). These cases were significant for understanding what factors inform spatial imaginaries for residents in communities where shale gas development was anticipated, but had not yet occurred. By selecting communities that were not the focus of mainstream media, we are able to help contribute to a broader picture of experiences of proposed shale gas exploration across rural Britain. This is significant as these spaces are often idealized as rural 'countryside' (Woods, 2003) where energy infrastructure projects are often feared and objected to (see Batel et al., 2015; Jones et al., 2018; Short and Szolucha, 2019; Brock, 2020). Below we present background information on each specific community to enhance readers' understanding of context that informs spatial imaginaries across these communities.

3.1. Case Study Background: Great Altcar & Formby

Thirteen miles north of the city of Liverpool in Lancashire, Great Altcar and Formby are two settlements that sit on either side of the A565 trunk road (see Fig. 1). The village of Great Altcar has a population of around 250 people, while to the West, Formby's population is around 20,000. While there are differences across the communities—Great Altcar, for example, is historically and primarily farmland with little access to internet or bus services and no village hall—in the case of the shale gas proposal in this area, residents in both communities were in close proximity to the site and shared concerns about it. As such, for the purposes of this research we focus on residents in both communities.

Great Altcar sits on the Lancashire Mosslands, comprised of lowland raised bog habitat, while Formby is coastal with thriving ecology in sand dune and pinewood habitats. Nearby to both are specially designated SSRI, RAMSAR (wetlands of international importance), National Trust and Green Belt areas. Aurora Energy Resources Ltd. was given licensing permission to explore shale gas in the area in July 2008. While a planning application was submitted in July 2019, the application was withdrawn in July 2020 before a decision could be made. Several local resident organizations had formed in opposition to the proposal, and the introduction of a fracking moratorium by the UK government in November 2019 likely contributed to the decision to withdraw the application. To date, no plans for drilling at either site have moved forward, nor are they anticipated to.

3.2. Case Study Background: Woodsetts

Nestled about 17 miles east of the city of Sheffield is the village of

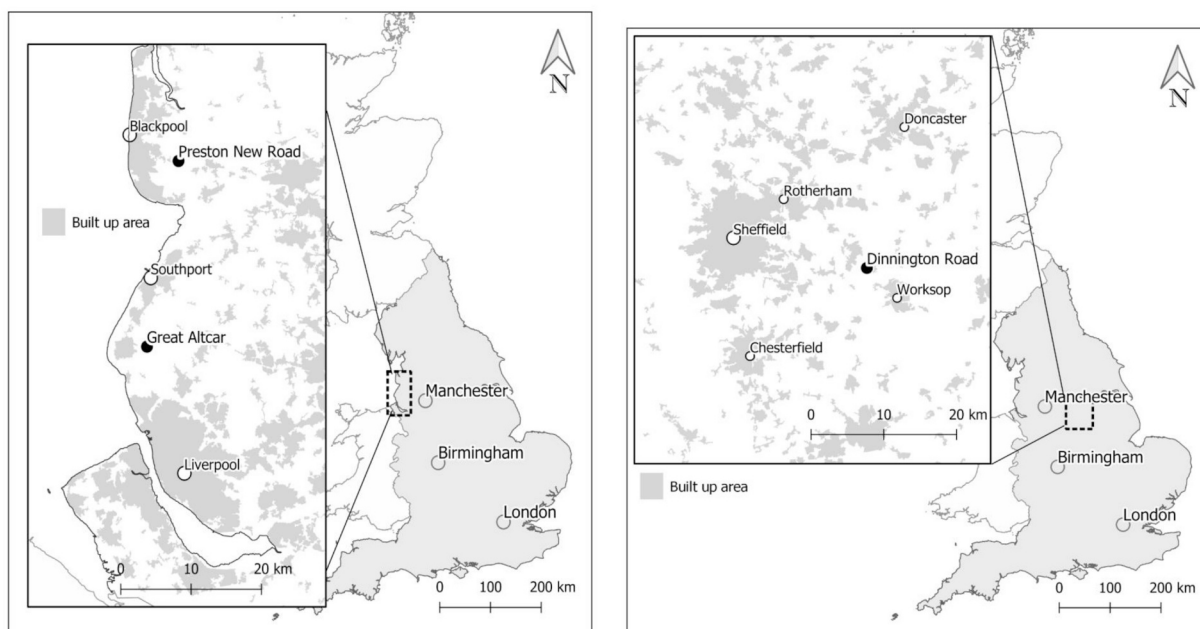


Fig. 1. Map of Great Altcar (left) and Woodsetts (right) case study locations.

Woodsetts, with a small population of around 2,000 residents (see Fig. 1, labelled for the ‘Dinnington Rd’ drill site). The village has a higher-than-average home ownership rate, where most residences consist of detached or semi-detached dwellings. The village is home to a large number of retirees, and near the main intersection of the village center sits a church, a school, a village hall, and a pub. The village is surrounded by open fields and some ancient woodlands, with several footpaths and bridleways cutting across them. Much of the area is designated as Green Belt, which is meant to preserve certain areas from urban growth. A key element of the village’s history is the importance of the local mines around the area, an industry for which many residents’ families had key ties. The nearby Anston Stones Wood is well-known for being the origin of the limestone used to build the UK Houses of Parliament.

On December 15, 2015, Ineos Shale was granted a shale exploration license by the UK government that included the area of land next to Woodsetts. An initial planning application was submitted to the local municipality in October 25, 2017, but was rejected on ecological and highway safety grounds. A second planning application was refused in September 2018, and was ultimately turned down by central government in June 2022. Over the course of this process, local community group ‘Woodsetts Against Fracking’ formed and campaigned against the site. At the height of the shale gas debate, local campaign signs in opposition hung from the windows of countless houses.

3.3. Data Collection

In each community, we relied on participant observation, semi-structured interviews and document analysis as multiple means of data collection (Marshall and Rossman, 2016). In Formby and Great Altcar, data collection occurred initially across four weeks in September-October 2019. During this time, Ryder went to see the local project sites, and attended different community meetings and activities. Data collection included conducting 27 interviews at this time, with follow-up interviews performed between November-December 2019. Interview guides included questions about place connections, community engagement, trust and inclusion in decision-making, and potential community impacts and benefits (see Appendix A). In Woodsetts, observation and data collection also began in 2019, with Devine-Wright attending the June 2019 Planning Inquiry, and Ryder conducting 18

interviews in March 2020. Additionally, Ryder became a member of social media groups that opposed the development, gaining the ability to observe how community members shared information, interacted and planned events within digital spaces, and framed collective concerns about their communities’ futures.

For participant recruitment, the authors relied on snowball sampling (Biernacki and Waldorf, 1981) across both case study sites. Additionally, participants were recruited through door knocking and letter dropping in homes in close proximity to each site. The authors worked to include perspectives from residents, resident campaigners, and local government representatives (see Table 1). Of the 45 interviewees, the participant group was skewed towards older and male participants. Further, those who opposed the projects far outweighed those who supported the projects. In Woodsetts, no one we spoke with expressed support for fracking or the local project, while only two of the three participants from the Great Altcar site who expressed support for shale gas generally also supported the locally proposed project.

3.4. Data Analysis

To analyze interview data, audio recordings were transcribed and inputted into Nvivo, where Author A identified key patterns via early memos and initial coding. Following this, we engaged in thematic coding (Rubin and Rubin, 2012) focused on questions related to place-based concerns for communities tied to the respective shale gas project. Data triangulation (Patton, 1999) was achieved through participant observation and informal conversations with local residents. To ensure the validity of our coding scheme, we reviewed our daily field notes in an iterative fashion throughout the course of data analysis. Further,

Table 1

Types of Interviewees (copied with permission from Author 2023).

	Great Altcar and Formby	Woodsetts
Residents	18	7
Resident Campaigners	3	6
Local Councillors	8	5
Total	27 ^a	18

^a These numbers do not add up because two individuals serve as both local councillors and resident campaigners.

Table 2
Summary of spatial imaginaries drawn upon by host communities to object to shale gas proposals.

Type of spatial imaginary	Spatial characteristics (features)	Points of comparison & 'othering'	Temporal, spatial, scalar & distributive concerns
Place imaginaries Woodsetts and Great Altcar – <i>Local place imaginaries</i>	Woodsetts as rural village with unique history of mining and ex-miners living in the community. Great Altcar as rural village with tenant farm agriculture; close to the town of Formby with a unique setting on coast with distinct landscape (Formby Beach Woods) and ecology (e.g. red squirrels). Both places said to have characteristics of idealised rural spaces: open space, little traffic, quiet, wildlife, footpaths. This included active engagement via footpaths, walking dogs, viewing wildlife, hearing birdsong.	Woodsetts and Great Altcar contrasted with 'othered' spaces such as brownfield sites, and the cities of Liverpool, Sheffield, London and New York.	Local history (e.g. mining in Woodsetts, tenant farming and some small pockets of oil extraction in Great Altcar, the "nodding donkeys," Norse settlement history of Formby). Spatial concerns are the specific locations in the community, i.e. in Woodsetts the proposed drill site being near housing for vulnerable people for example. Another spatial aspect is the connections that were forged across multiple community campaign groups in the same regional area (i.e. Formby, Halsall, Blackpool; Woodsetts and Dinnington).
North of England – <i>Regional place imaginary</i>	Depopulated and "desolate" for energy extraction (e.g. coal mining), sacrifice zones.	Referenced here is a member of Parliament voicing opposition to proposed shale exploration in Sussex. The two case study sites are in a region described as the "desolate north" and 'othered' relative to the south of England. The south of England, in comparison to the north, is seen as more populous and attractive, containing the economic centers of the country. Residents expressed feeling that the wealth of the south comes at the expense of people and places in the north of England.	For residents in this research, this represents historical, subnational-level spatial pattern of inequality and distributive injustice. Some participants reference extractive patterns and the north as a "sacrifice zone" for the south, and fear shale gas extraction as a continuation of this into the future.
Great Britain – <i>National place imaginary</i>	A small island with high population density.	Great Britain is compared to other nations, particularly those they view as having huge swathes of empty, open land where there are no people living nearby. America and its deserts, the specific US states of Wyoming, Pennsylvania and Arizona, and Australia and the outback are all 'othered' in these narratives. One person suggests drilling in these places would mean no one would notice at all, as opposed to the locations in Great Britain which are all "naturally beautiful sites." Another pointed to the size of the country and the population density to note place-fit discrepancy: "It's just not the right place, is it?"	Participants reference present day differences in population density across multiple spatial scales, such as the subnational and national levels in making cross-country comparisons. In this case distributive concerns primarily seem to suggest that this needs to be done in places <i>where people do not live</i> , but there are also some assumptions that these type of spaces are devoid of life and beauty and thus suggest another reason they may be less important to protect. Further, there is evidence that shale gas exploration and development even in these other countries are still developed near populations, suggesting the size of a country and the existence of open space does not automatically mean drilling occurs far from where people live.
Idealised space imaginaries British countryside as 'rural idyll'	Agricultural landscape of fields and hedgerows, few built structures, small village settlements, little traffic, tranquil, wildlife, birdsong, footpaths and bridleways.	This is contrasted through the 'othering' of cities & urban spaces that are crowded, polluted, busy, filled with traffic, working class, less safe, industrial.	Idealised imaginary cross-cuts scales from national to local and with local-level comparisons across GB and the US. Disparity between rural and urban areas; and the threat of increasing encroachment of industry and urbanism on scarce rural areas. Fracking represented as incompatible with the British Countryside, taking away its character as 'rural idyll' and is therefore 'out of place'.
Spatial Transformation Imaginaries arising from fracking/shale gas extraction 'Industrialisation' of the countryside	Changes to each place and community that make them less of a local exemplar of the idealised imaginary of the British countryside as 'rural idyll'. More of an emphasis on what would be lost (de-ruralisation) than would be coming (industrialisation).	Residents expressed short term concerns about 'outside' fracking protestors – 'the wrong type of people' that were distinguished from community members, and would likely invite a police presence with associated disruptions to village life. There was also concern about how those who could move in (relative also to who moved	In reflecting on local-level changes as a result to the proposed shale gas projects, people expressed concerns about intensity of place change that might leave their community unrecognizable. These concerns included transformations due to seismic activity and damage to houses, drops in property values, mass exodus of community

(continued on next page)

Table 2 (continued)

Type of spatial imaginary	Spatial characteristics (features)	Points of comparison & 'othering'	Temporal, spatial, scalar & distributive concerns
	Taking away the tranquility, lack of people, reducing greenspace – impacting the rural landscape, impacting 'pristine', unspoilt wildlife and nature	out) might change the character of the community and their connections.	members and businesses, and damage to local places of importance such as footpaths and degradation of the local ecosystem and wildlife. They also recognized that the ability to leave (i. e. to sell property) would not be shared equally across the community, that some community members might also be 'stuck' living in a place they no longer wanted to be, given the vast potential changes.
Loss of national independence (self-sufficiency, self-reliance)	Adding built infrastructures to rural landscapes, with related consequences of more noise, pollution, traffic, workers, industrial processes etc. Changes to Great Britain, especially as it specifically relates to the characteristic of being an island nation. Loss of farmland due to industrialisation/fracking.	No direct comparison, emphasis on a greater need for self reliance as an island than some other countries might have.	When discussing how they envision shale gas development to have national-scale impacts, some participants raised questions about what it would mean not just for the impact on high quality agricultural land, but what the implications of that would be for people's access to food in the UK.
Climate Chaos at global, national and local scales	Participants expressed concern about global-level changes due to climate change if there remained a reliance on fossil fuels, which the locally-proposed shale gas development projects came to represent.	Given the global level of concern, there was no reliance on othering or comparisons to support an argument against locally proposed developments.	In terms of the long-term future of the communities, interviewees reflected on the local-level impacts of climate-induced flooding and how a reliance on shale gas would exacerbate climate issues. Further, they expressed concern for how these climate-induced risks might threaten ways of life for future generations locally. Given that both Great Altcar and nearby Formby are said to lie below sea-level, interviewees expressed concerns that the area would be flooded from sea-level rise arising from climate change. Additionally, residents expressed concern for future generations in the UK that would be negatively impacted by flooding. This intergenerational justice concern is a distributive issues that spans generational time. Global level concerns were expressed related to the impacts of fossil-fuel driven climate change, particularly in terms of climate injustice as the distribution of the negative impacts of climate change do and are likely to continue to impact the most marginalized people in the world if fossil fuel development continues.

through document analysis of the planning applications we worked to better understand the particularities of place-based social and environmental issues across the sites, such as the operator statements of engagements. Through a combination of the above methods, and drawing on the two case studies, we developed a deeper understanding of how place imaginaries, idealized spaces, and spatial transformations relate to stances taken on the proposed shale gas projects.

4. Findings

Residents across both communities expressed spatial imaginaries that shared many commonalities, including idealized spatial imaginaries (a 'rural idyll' of the British Countryside), place imaginaries at multiple scales (locally, the two villages of Woodsetts and Great Altcar, as well as nationally, the imaginary of Great Britain as a 'small island') and spatial transformations (including threats of 'industrialisation' to that idealized space of the countryside)(see Table 2 for a summary). In the following sections, we explore how community members engage with each of these different types of spatial imaginaries and the comparisons they draw on to support these understandings of change.

4.1. The British countryside as an idealized space or 'rural idyll' threatened by fracking

While in this study each community had their distinct and unique place-based connections, they also expressed similar understandings of their respective locations as representative of the 'countryside' in Britain more generally, attesting to a collective imaginary of the countryside as an idealized space, defined by certain generic and universal characteristics (Watkins, 2015). This imaginary included things like open space, peace and quiet, lack of pollution, and access to nature, reflecting a longstanding idea of the countryside as a 'rural idyll' (Woods, 2003):

We're fortunate in this area that we've got such a lot of open space... rather than looking at somebody's house all day, 20, 30 yards away, you can come to these places and you've got open field of vision. It's just having that feeling of a bit more space than you've got elsewhere. – Woodsetts 6

[We've] got a massive tract of land with no disturbance, no vehicles, very little public access, so it provides a great breeding ground for endangered farmland birds ...It is a very sort of special quiet area, it's really valuable to local people, especially from the urban areas to come out for a bit of peace and quiet. – Altcar 21

Interviewees hint at how they define their local countryside: access to open spaces, footpaths, wildlife and peace and quiet. Yet they do so by

also subtly referring to other spaces, or what the countryside is *not*. Several interviewees took this a step further by not only describing these same characteristics across the locations, but engaging in ‘othering’ to distinguish their areas from ‘urban’ space. They used both general features of urban areas as idealized spaces, but also drew on place imaginaries of specific cities that represented this, referencing nearby smaller cities and towns as well as major global cities:

We just wanted to get away from living on top of people and just having, being surrounded by immediate neighbours so this suits us a lot better... You kind of avoid any of the negative aspects or the idiocy that can be brought in by certain individuals at certain levels [in Liverpool]. So yeah, that helps relieve the stress and any worry that you've got or concerns, especially with children, you know that they're going to be safe as well. – Altcar 16

I mean for an example I went to London three weeks since and it's like a different world there and when you think to yourself and when you come back and you get back in to here, I always have that sort of, "Oh I'm back in Woodsetts", you know what I mean? – Woodsetts 9

In efforts to define the essence of the ‘countryside’, residents rely in part on defining their understanding of ‘the city’ as a negative idealized space that is crowded, polluted, busy, filled with traffic, working class, and less safe. Yet when they reflect on the prospects of shale gas development, they draw more heavily on how they and other community members *actively use and engage with the countryside*, and how these very characteristics might be threatened by the proposed fracking projects:

The field where it's [the fracking] proposed to be is one of our favourite walks isn't it, so we walk round the outside of it and go into the woods, Dewey Dales Woods. And you know, it's beautiful we can look across to our house from the fields and it all looks very nice, very pretty. Like I said that's where I see a lot of the wildlife we've spoken about, the flowers and all of that. So the thought that that wouldn't be available to us or will be spoilt by these building and this whatever's going to go there, that concerns me greatly. – Woodsetts 3

You go up there [to the field] now, I've been up there this morning, there's birds singing, and there's a vista, there's a view, and just that feel good factor, because green space is important. This is why people go walking. The village uses the paths a lot, and it's that sense of wellbeing. Now, I wouldn't go up there if there was cabins stacked on top of each other and a fence, and great big earth mounds, and lorries parked there. – Woodsetts 5

Fracking is seen as posing a threat to the nature of the countryside, how the local material world is viewed, experienced, and interacted with and the way this contributes to community wellbeing. For example, one interviewee mentioned that she would likely no longer feel she could pick and consume berries along the footpath adjacent to the proposed site. Another discussed their preemptive purchase of blackout curtains. Overall, residents reflected the concern that the technology is in the wrong place, that is there is place-fit disparity that would impact their engagement with their local environment (Devine-Wright, 2011a – see also Cresswell, 1996). While many respondents suggested that the need to move away from fossil fuels meant that shale gas extraction should not occur anywhere, they still at times offered up alternative areas where they believed it would be more suitable. In suggesting alternative locales, several residents relied on types of ‘idealized spaces’ which they contrasted with the countryside generally, and their localities specifically. These included spaces perceived as more urban and industrialized, or previously developed brownfield sites:

Sheffield is an industry city... They could do it that way on, on the towns, not in little villages in the countryside and ruin what bit we've got left... They should leave us alone and go on the edges of cities or wherever, on the brown field sites – Woodsetts 12(b)

Leave the countryside alone. Leave it alone. There's enough areas built on, derelict, what they call brown [brownfield] areas... It's only an island. We haven't got a lot of space. – Altcar 3

Here again, we see residents in both communities use “othering” to justify why shale gas development is out of place in their local countryside. These comparisons demonstrate the degree to which an idealization of the ‘British countryside’ at the national level, informs local residents’ concerns about the spatial transformations that would occur if shale gas development were to be undertaken locally. While such sentiments could be interpreted as ‘NIMBYism’, we see this as more accurately understood as residents’ use of spatial imaginaries—for which they rely on their active engagement with their local material world—to contest local shale gas exploration. Further, the contestations rooted in their spatial imaginaries did not stop at their so-called backyard. Instead, they also mobilised national-level ‘place imaginaries’ to highlight regional discrepancies and alternative global spaces that might be more suitable for fracking.

4.2. Place imaginaries and othering on a ‘small island’

Watkins (2015) describes place imaginaries as imaginaries of distinct, specific spaces thought of as unique and to which particular characteristics are ascribed. Residents across our case study communities mobilised place imaginaries in their expressed opposition to shale gas in two ways. First, they highlighted problems with shale gas development by drawing on regional imaginaries of the north and south of England; second they drew on spatial imaginaries of Great Britain more broadly.

At the regional scale, their concerns stemmed from historically uneven spatial and economic patterns of industrialization, with consequences for how regions of Great Britain are collectively imagined, specifically resource extraction in the north for the benefit of more populous areas in the south. This is similar to findings about regional place imaginaries in Sweden, except in that context, regional place imaginaries were used by industry stakeholders to legitimise rather than contest further resource extraction (Devine-Wright and Peacock, 2024; see also Cotton, 2017).

A resident noted their observation of Parliament’s questions about proposed drilling in the south of England:

One of the things that was said in discussions in parliament was why are we doing it in this area [Sussex]? Aren't there acres and acres of the desolate north where nobody live... so that was actually the words, "the desolate north." – Altcar 12

This resident is contesting a ‘northern’ place imaginary of a region that is depopulated and desolate, othered in contrast to a more populous and attractive ‘south’ that is, by extension, less suited to shale exploration. Not only do such community arguments contest the ‘acceptable’ deployment of different energy technologies over time and across space (Chateau et al., 2021:5), they also reflect ways that anticipated changes to places arising from energy projects serve to perpetuate historical inequalities while simultaneously disrupting place-related attachments and identities of those communities.

A second interviewee described the continuation of exploitative, historical north–south place relations:

There is very much a south-north divide on this because a lot of what's happened in the past was, no matter where the economic centre is for the growth of our economy, the energy came from around here, from Northumberland, from Wales, from central Scotland and parts of Kent, and those areas were blighted to provide the energy for the Victorians and right through until the 1980 s Britain... There's a lot of wealth in London that emanates from energy extraction in places that weren't getting the benefit. And we just saw that as a possibility again, that we don't get the benefit in the end. If they started extracting from here in North Yorkshire, Lancashire and across the key area in North Notts [Nottinghamshire], we

would be the sacrifice zone providing the energy for the enrichment of the country but in areas of the country that didn't come back to us. – Woodsetts 4

At this regional spatial scale, residents found themselves as the ones being 'othered' by energy and policy stakeholders. Yet this did not lead to widespread suggestions that the practice should suddenly be taken up in the south of England. Instead, interviewees jumped scale by deploying a national place imaginary of Great Britain as a 'small island', and othering Great Britain in relation to the USA and Australia, to support the notion that it wasn't just the countryside (as an idealized spatial imaginary) or Northern England (as a regional place imaginary) that should be absolved from fracking, but the country as a whole:

And to face the prospect of a Pennsylvania-type springing up of wells, and all the infrastructure that then has to go with that... we're a small island, at the end of the day, aren't we? We haven't got the space that the US has got. We're a small island, we're tightly-populated, and it's just not the right place to do it, is it? – Woodsetts 1

This 'small island' place imaginary of Great Britain emphasized both a lack of geographic space and high population density as reasons for place-fit objections to fracking. Instead, interviewees looked toward larger countries with more open space, like the USA¹ and Australia, as more appropriate places for drilling:

They have a fracking industry in the States...but we're only a small island, we haven't got a lot of space to keep them away from villages, so I just think it's too near. – Altcar 22

Thus, large spaces of land with very low-population densities become important for residents' justification for why some places—like America and Australia—are suitable for shale gas extraction, while others like England and the UK are not:

It's a balance between the damage it does to the environment and the ever-increasing pressure that increasing populations require. And it's a balance which is harder to maintain or absorb in a small country like the UK, easier in a country like the US. I mean I imagine your fracking sites are out in the middle of nowhere...certainly are much farther away from big areas of populations than Altcar is. – Altcar 23

The prevalent idea, then, is that shale gas might be acceptable in a place where sufficient space means that the practice is not taking place near people, but instead in the 'middle of nowhere,' which implies the space as empty and even potentially devoid of areas deemed as socially, ecologically or otherwise economically meaningful places. Others expressed similar sentiments:

We're an island...we haven't got vast amounts of land, not like America, America's huge, so we haven't got that type of land, so they can go frack in the middle of the desert or wherever they want, and nobody would even know they were there, but all ours is going to be...naturally beautiful sites. – Altcar 2

My goodness me, look at America and look at tiny us. Are we even as big as one state? I don't think we are. I really don't think we are. If you have to do it, go into the deserts of Arizona or wherever, if there is a desert there! Don't do it to Great Britain. Don't. Leave us alone...Leave villagers like ourselves alone. – Woodsetts 13

These concerns voiced about Great Britain as 'just an island' rely on a place imaginary that is rife with contradictions when juxtaposed against

the narratives of the need for protecting the 'countryside' as an idealized space. Just as the claims about the value of open space were used to support the protection of the countryside, here we see open space being drawn on to support place imaginaries about America as a more suitable place to drill. There is, then, a lack of consistency with how imaginaries of open spaces are being envisioned, depending on perceived vastness and whether they are near or far away from settlements. The argument relies largely on the size of the country relative to the UK, and the "vast expanses" of land where the scaling up of shale gas was considered more suitable.

Further, objections to being deemed a "desolate" area themselves did not prevent the same argument being used as a justification for why the U.S. desert was a potentially appropriate space for shale gas development. This relies on a false place imaginary where deserts in the western US are not perceived to be diverse ecosystems that teem with life or places with productive agricultural value and thus may be perceived as lacking when it comes to other or better land uses outside of energy exploration.

Not only does the above highlight multiscale contradictions in comparative references about space and place, it glosses over the experiences of many U.S. residents who have been challenging well sites within their communities (e.g. Fry, Brannstrom and Sakinejad, 2017; Ryder and Malin, 2024). This reflects similar findings about UK attitudes towards the US that paint the US as a monolith in the context of shale gas development (Williams and Sovacool, 2019).

4.3. Spatial transformations and disruption to the British countryside

Spatial transformation imaginaries are narratives about general processes of change to spaces and places (Watkins, 2015). In the case of both Woodsetts and Altcar, residents relied on their understandings of their local communities relative to other spaces and places, fearing the potential spatial transformations that shale gas development might bring. This included concerns about how potential temporary and permanent 'outsiders' might change the community, as well as fears about the long-term impacts of continued fossil fuel development, in particular the potential impacts of both climate change and industrialization on their beloved countryside and their active and embodied country lifestyle.

4.3.1. Changing faces in local spaces – The disruption of who might come and go

Residents held several concerns about how shale gas development might transform their local communities and their day-to-day way of life in these places. For Altcar residents who were aware of protest activism at a nearby shale gas site in Preston New Road, their most immediate concerns were fears about potential disruption if 'outsiders' in the form of anti-shale protestors were to descend on the area:

That [protests] will be a nightmare for [name redacted] because access to the fields is through that track so if all these people are there, they're not going to get access when they need...Well, it would affect me as well. – Altcar 14(b)

You'll get that many protestors as they're still protesting three years on at Singleton, so we'll get that many protestors... They're entitled to protest but it'll be stopping people going about their job... They [protestors] come from anywhere... They only need to block this road, don't they?...How are farmers going to get onto the land? You know, they can't. – Altcar 20

This was a particularly prominent concern for the two residents who were supportive of the proposed shale gas project in Great Altcar. Residents across both communities also worried about the volume of people and unwanted attention the issue might bring to the area, as well as an increased police presence. Essentially, there were perceptions that, while some residents might appreciate the support for their cause, there would likely be people within the crowds that could make trouble by disturbing the peace and pristineness of the area:

¹ It is worth noting that the researcher primarily conducting interviews (Ryder) is from the USA. It is possible that this might also have contributed to the degree to which the USA was brought up by different participants. However, it is also true that the USA has the largest success with the shale gas industry so it does tend to dominate the research and activist landscape and serves as a likely point of comparison regardless of the researcher's nationality.

You get some that just join in [with protestors], they say they're anti-frackers, a lot of them are just there for trouble causing. We don't want that and we don't know if that's going to bring obviously the wrong type of these people in along with the proper people who want to be against fracking. What rubbish is going to be generated from it? Are we going to get rubbish just chucked – over gardens or are they going to keep it clean? – Woodsetts 11

I think there's a portion of the village who welcome them (outside protestors), I think there's a portion of the village who would not be pleased at all if they came and made a camp somewhere. And then there's the sort of consequences of the police activity, again it wouldn't be welcome. – Woodsetts 3

'Othering' is again used as a tool, this time at an individual level as extralocal individuals traveling to protest against fracking are seen as a threat to the idealized 'countryside' space and the materiality of local ways of life—the peace and quiet, pristine nature, lack of traffic, and farming activities. Protestors, painted as outsiders that would change the character of the village, were seen as a threat caused indirectly by shale gas development. For example, some residents expressed concerns about whether protestors would take up other localized environmental issues if they were to embed in the community.

This 'othering' of outsiders was not limited to concerns about short-term intrusion, but was also something residents reflected on when thinking long-term about how the onset of shale gas might impact who could and would want to remain or move into the villages, thus changing the social characteristics of the place in a more permanent way. The primary avenue through which residents envisioned these potential long-term changes to who makes up the community was through economic changes to housing values. Residents envisioned how their communities would be wholly disrupted both because of the potential that core community members might leave and also because those who might want to leave would lack the resources to move—especially if they could not get a fair value from their house. Consequently, residents saw the impending shale gas exploration as having the potential to completely alter the character of the community, transforming their cherished countryside into a place that they and others would no longer find a desirable place to live:

It [shale gas] will have a major impact on the human aspect of the environment if people don't want to live here anymore. People will not be able to sell their houses, if they can't sell their houses, people are not going to be able to rent houses out here either. Nobody's going to want to live here. – Altcar 12

I think a lot of people have tried to sell their houses but obviously if people know what's likely to be coming, it's going to affect property prices, so that's another worry for people who've gone there to retire and think, well, my retirement might not be as peaceful or whatever I thought it was going to be. – Woodsetts 6

This contributed to fears of the destruction of a sense of community over time. Further, residents wondered that if people were able to sell their houses, who, exactly would be moving in? Some expressed concern about who might move into the community permanently:

Because of this fracking, there's a lot of people moved and putting their houses up for sale to move out just in case it does go ahead. You get nice people moving out, you don't know what you're going to get moving in, I always say it's better the devil you know. – Woodsetts 11

Thus residents employed spatial transformation imaginaries that also involved imaginary publics – collectively held ideas about certain types of people, such as protestors or 'outsiders' (Maranta et al., 2003). Threat to place was said to arise from a near-term influx of these 'outsiders' as well as the longer-term spatial impacts that could negatively impact and push out long-term residents. As is clear, concerns about the impacts of drilling on nearby houses was not only about their market values and potential economic gains or losses. Instead, the spatial transformations

that fracking was assumed to bring to their local areas had more to do with continued concern for the changing character of the community, and disruption to people's senses of place. It meant families had to think about uprooting their lives in a way they had never anticipated as being necessary, that is, the concern was a broader one of the disruption of place, and the destruction of sense of community through a socio-spatial transformation of the village.

4.3.2. Place Disruption and Industrialization of the Idealized Countryside

When envisioning the spatial transformations that would accompany the onset of the proposed shale gas exploration projects, residents indeed perceived their day-to-day activities to be under attack. In both villages, there was concern about the potential loss of access to important outdoor spaces where residents are actively engaged, such as footpaths and bridleways. These serve a significant community function—to connect people to the place through their relationships with other people, the landscape, and nonhuman bonds. In both Great Altcar and Woodsetts, these footpaths serve as sites for community members to move through, while taking in the peace and quiet of the countryside, connecting with their neighbors as well as nature and wildlife, and bonding with their domesticated animals. Both proposed drilling sites were near where footpaths crossed through local agricultural fields. As we make the case above, spatial transformations associated with the proposed shale gas development were seen as a direct threat to these embodied connections and the way residents envisioned these connections in the future. They instead saw a potential disruption to the essence of their way of life in each respective village and a transformation to the countryside through a process of industrialization:

Without a shadow of a doubt, and I've said this from the very beginning [if the shale gas development goes ahead], Woodsetts will be deemed to be an industrial village. It will no longer be a rural village that we are all so blessed to be living in. I feel quite emotional about that. I feel very, very, very strong about maintaining and retaining its beauty and its peace and its calm. You have to have that in villages. You can't have everywhere being industrial, it's just ridiculous. – Woodsetts 14

While many different types of industrial and development activities might fuel similar fears, the success or failure of energy infrastructure projects in the transition to low carbon energy sources will have consequences across multiple scales. Further, the concerns tied to shale gas development, and the continuation of reliance on fossil fuels it represents, creates distinct environmental, ecological, and climate justice concerns at a time of urgency for a global energy transition. One Altcar resident described this in great detail, touching on countless concerns about potential disruption:

Businesses will leave and the whole area will become depressed and run down. The houses, themselves, because of the earthquake factor and that were built on sand and the liquification of the sand with the earth tremors and so on, means that there's likely to be substantial damage to all the buildings anyway, particularly on the coastal areas...There's masses of wildlife out there...Just loads of birds that are threatened in this country already. Lapwings and skylarks are threatened already. There's water voles out there...foxes and hedgehogs and badgers and hedgehogs are very, very threatened... There's the over wintering wild fowl from Siberia and Iceland and so on that this is a very, very important stopping over place and, in world terms, that will have an enormous impact and, presumably, also on summer birds that come here for the summer, like swallows and those sorts of things, will be impacted by it. It's just unthinkable, really, that they are destroying all this. There is Lunt Meadows Nature Reserve...It doesn't look like anything much, but the amount of wildlife there is astonishing. There's egrets and herons and all sorts of birds that, you know, I'd have to look up in a book and things like this and it's just... and it's teeming with it, and barn owls. You know it's just... and that's not very far away and it will all be affected. Obviously, the stuff near the site is going to be affected by all the activity and the building and

etc., but it will all be affected by the pollution of the atmosphere and the water and the land and so on. It's... it's outrageous. There's climate change. These are fossil fuels so should be left in the ground. There is no way that we can do this and be even pretending that we're attempting to keep to our commitments to climate change and that, obviously, affects not just people here but all over the world, mostly poor people who are already suffering. – Altcar 12

Documented through individual interviews where residents shared how they had publicly spoken about the issues, as well as participant observation of meetings and activist spaces both in person and online, residents expressed similar concerns that point to a collective vision of spatial transformation, a dystopian future eradicating the visions they held about their communities' futures before facing local shale gas development. They express concern about disruptions to their shared senses of place, particularly in terms of their idyllic vision of their local countryside and how that material connection informs their active relationships with the landscape, wildlife and domestic animals, and each other. The potential for shale gas development threatened all of these ties, to the point where they saw their communities in the future as unrecognizable from the places they had grown attached to. Furthermore, they feared what world shale development might leave for future generations in terms of direct, local impacts:

I think we're just going to ruin it for all future generations, you know, because when they do these sites, I mean, this site is on farm land, grade I, agricultural farm land, so where are we going to get food from? We're an island, and if we cut ourselves off from everybody, where are we going to grow food? Well, we won't grow food, we'll just stick a fracking site there, do you know what I mean?...So if we want a land full of concrete pads, then fracking is the way forward. And I think, you know, we've had the benefit of our countryside and our beautiful land, as I call it, you know, why can't our future generations have that? – Altcar 11

As well as the broader, more indirect impacts of climate change which shale development exacerbates:

And anyone who's got the least worry about climate change... it's going to raise sea levels and everything. I mean, this... this place, Formby, is well below sea level. We'll be under water with climate change...So, maybe that's what's driving people to fight fracking. – Altcar 11

Taken together, residents in each community see shale gas exploration as a driver of local spatial transformations that disrupt collectively held beliefs related to (1) place imaginaries about their local communities and (2) the idealized space of the British countryside on their "small island". In these visions of spatial transformation, shale gas exploration would displace and destroy their local communities and the attachments they have developed within them. In some cases, they have already experienced some of this disruption, in others, there are fears for immediate disruption, such as protestors, noise, light and visual pollution, and long-term disruption to the health of residents and to the fabric of the community itself. Often, these future visions are drawn from fear of the potential scale of the practice of shale gas and the degree to which it disrupts peoples desires to live there versus elsewhere. These concerns also stretch to future generations, where their local areas and the entire planet face strains tied to the continuation of reliance in fossil fuels, which the local shale gas projects represent to them. These findings aligns with Davidson's (2017) work that demonstrates how place change tied to shale development has the potential to create community trauma.

5. Discussion

Our findings suggest that across both case studies, similar idealized imaginaries of a 'rural idyll' (the British countryside), place imaginaries at different scales (Woodsetts and Great Altcar villages, North vs. South of England, Great Britain as a small island, the USA or Australia as more suitable places for fracking) and spatial transformation

(industrialization of the British countryside) are utilized by residents to demonstrate a lack of place-technology fit for shale technologies (see Table 2). These spatial imaginaries are informed by how residents' envision potential place change tied to shale gas as threatening embodied relationships to the material world in everyday life, and how that shapes their social relationships.

The defensive arguments used by community members to object to local shale gas proposals that are highlighted in this research depend on a manipulation of spatial imaginaries that carries both contradiction and consistency. Several contradictions underpinned the different spatial imaginaries mobilised by each community. For example, if the British countryside is characterised in terms of natural landscapes, fields and open spaces without buildings and infrastructure, can it also be represented as too densely populated (by comparison to the US or Australia) to be suitable for shale gas exploration? Second, haven't modern, mechanised and often monocultural agricultural practices already 'industrialized' the rural countryside in countries like the UK? Finally, can formerly industrialized, coal mining villages like Woodsetts, which have visible, material legacies of extraction in the local landscape such as waste heaps, be regarded as 'rural'?

Yet, there were also numerous instances of consistency and mutual reinforcement between idealized spaces (the countryside vs urban/industrial areas), place imaginaries (the local village and its distinctive character; Britain as a whole) and spatial transformation imaginaries (the possible transformations to rural village place(s) if 'industrialised' fracking were to happen). Indeed, it could be argued that the fact that Woodsetts and Great Altcar were viewed by residents as exemplars of a particular 'type' of place (i.e. a quintessential rural village) made them more sought after locations to live in the first place and therefore, even more important to be defended and protected from harm. This identification of interdependencies and mutual reinforcements between types of spatial imaginary advance our understanding of polymorphy in socio-spatial relations and the relational functions that spatial imaginaries can play in informing community organizing and opposition to place change (Jessop et al., 2008; Watkins, 2015).

Intertwinings between types of spatial imaginary call to mind previous research that sought to understand how socio-technical regimes (re)produce their dominance from a spatial perspective. To understand the largely unopposed deployment of natural gas facilities in England, Cowell (2020) argued that a 'system of places' exists that serves to legitimize particular beliefs about the appropriate relationship between energy technologies, places and people, which governs the logic of acceptable change, and which defuses or disables challenge. Similarly, Chateau (2024) argued that idealized spaces, place imaginaries and spatial transformation imaginaries are embedded in and encode macro and micro systems of places, bringing imaginaries at multiple scales into the analysis. Here, we demonstrate how individuals argue for and against place change through engaging different types of spatial imaginaries across different scales, and how these arguments at times converge and contradict. Future research is required to develop, both conceptually and empirically, these relational understandings of spatial imaginaries and how they are drawn upon by diverse actors operating at multiple scales in contexts of place change.

The findings also exemplify how spatial imaginaries are built through numerous processes of 'othering', for example distinguishing the British countryside from urban and industrial spaces, the North from the South of England, the small island nation from bigger countries with vast open space, and distinguishing locals from 'outsiders' who might infiltrate the community in a shale exploration scenario. Many of these arguments draw on a historical lack of recognition and experiences of distributive injustice, between rural and urban areas, between northern and southern regions in England and between nations of the UK. In that sense, the spatial imaginaries drawn upon by our case study communities, and their use of othering, reveal broader and longstanding concerns of fairness and justice that deserve recognition in policy and practice. A more inclusive approach to energy transitions would be

sensitive to those socio-historical injustices and view community responses to specific energy proposals against that broader backdrop. Specifically, policy makers could recognise efforts by host communities to situate local proposals within broader narratives of injustice or exploitation as relevant to, rather than outside of the scope of, land-use planning or technology deployment processes.

That said, it is also important to note that, even if injustices are often to be found in the treatment of host communities impacted by infrastructure projects, and though we are not suggesting this is the case here, the strategic use of 'othering' by residents, as a way to draw distinctions between spaces and places, has the potential to further embed stereotypical, essentialised ideas about sets of spaces, places and people (Batel and Devine-Wright, 2017). For example, while not used by participants in this research in this way, claims around Britain as a small island have also been used to justify anti-immigrant sentiments. Thus, these issues of manipulation, contradiction and othering used in other contexts have the potential to create harm and are worthy of deeper attention in future research. So too, is the question of how different types of spatial imaginaries might emerge without relying so heavily on processes of othering that depend on comparisons across peoples, spaces and places.

Findings also indicate how community members use spatial imaginaries both to argue for change and to prevent it. For example, geographical divides such as urban/rural and north/south are inscribed in history and used to make two different kinds of spatial arguments: either that things should remain as they are (e.g. to maintain the distinction between urban and rural spaces) or that they should change (e.g. to reduce the gap between the prosperous South of England and the relatively impoverished North). Similar to the examples of othering noted above, underpinning arguments about change (or not) are ideas about fairness and justice that serve to indicate how the performance of spatial imaginaries are embedded within broader ideas of spatial and environmental justice (Walker, 2009; Cotton, 2017). Future research could develop these understandings in three ways. First, to develop theorisations of spatial imaginary that are about stability and conservation, not merely change and transformation, extending Watkins' typology (Watkins, 2015). Second, to deepen understanding of relations between spatial imaginaries and environmental justice, tracing implications in relation to procedural and recognition dimensions as well as distributive justice (Walker, 2012). Finally, to utilise spatial imaginaries to understand not only contexts of shale gas fracking, but other technology sectors that are a part of efforts toward low carbon energy transitions.

This research also extends our understanding of relations between spatial imaginaries and imaginary publics (Maranta et al., 2003). For example, previous research has identified "left behind" places populated by 'left behind' citizens that were othered with 'metropolitan elites' (Sykes, 2018: 137). Here, imaginary publics were found to be constituent elements of some spatial transformation imaginaries, notably concerns about the impacts on local communities of an influx of 'outsiders' or protestors, as well as the police that might be needed to control them. This supports recent research that noted connections between spatial, socio-technical and public imaginaries at regional and national scales. Those findings indicated how stakeholder arguments about 'acceptable' locations for technology deployment were as much about the kinds of people assumed to live in those areas as the places themselves or the changes that would take place there (Peacock and Devine-Wright, 2025).

These findings further support longstanding critiques of 'NIMBYism' (e.g. Burningham, 2000; Burningham et al., 2015) by showing the extra-local spatialities of community objections to energy projects. In our case studies, many residents were concerned about not just their own communities, but anywhere that fracking might happen. Further, they were concerned about future generations as well. Yet, the 'small island' place imaginary does suggest that there are some bounds around where concerns about place-based disruptions may lie, further evidenced by the notion that empty or 'placeless' space in bigger countries, such as the

USA and Australia, might be more suitable locations for these type of projects by comparison to local areas.

6. Conclusion

In this research, we aimed to investigate how communities facing local proposals for shale gas exploration draw on spatial imaginaries to make sense of change. In doing so, we sought to extend our understanding of the interdependencies amongst different types of spatial imaginary, how they relate to fairness and justice concerns, as well as widening existing place-based research on shale gas. By examining how the anticipation of fracking intersects with residents' shared spatial imaginaries, we advance understandings of sociospatial relations and specifically contexts of place change. Further, we advance the literature by exploring the way idealized spaces, place imaginaries and spatial transformations are connected, related, distinct and contradictory (Watkins, 2015). We demonstrate how in practice collectively held spatial imaginaries can form across multiple scales, and how 'othering' is used as a tool to inform these imaginaries. Our findings develop Watkins (2015) framework, as there have been relatively few studies that apply all three types of spatial imaginaries to understand contexts of place change. In doing so, we echo Benner's (2025) call for clarification of the temporal dimensions of spatial imaginaries, given that residents in our case study communities drew on past, present and futures. Finally, our findings draw attention to ways that issues of distributive injustice inform community fears of spatial transformations. This suggests the importance of including locals visions in energy infrastructure planning, in order to align developer-led projects with community visions. If we can do so, we can pursue the transition to a low carbon energy system in ways that will be more fair and inclusive, and can aim to benefit us all.

CRedit authorship contribution statement

Stacia Ryder: Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Investigation, Formal analysis, Data curation. **Patrick Devine-Wright:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Jen Dickie:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Zoe Chateau:** Writing – review & editing, Validation, Methodology, Investigation, Conceptualization. **Phil Bartie:** Writing – review & editing, Validation, Methodology, Investigation, Funding acquisition, Conceptualization. **Darrick Evensen:** Writing – review & editing, Validation, Methodology, Investigation, Funding acquisition, Conceptualization. **Lorraine Whitmarsh:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

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.

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Data availability

The authors do not have permission to share data.

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