My neighbourhood, my country or my planet? The influence of multiple place attachments and climate change concern on social acceptance of energy infrastructure

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Highlights

- Addresses ‘localist’ focus of social acceptance research
- Utilises survey data from representative sample of UK adults (N = 1519)
- Examines differences between 5 place attachment subgroups
- Shows significant differences between groups, controlling for age, party affiliation

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Abstract

Research on place attachments and identities has made an important contribution to understanding social acceptance of low carbon infrastructure, which are often objected to by local communities. However, a focus on local attachments predominates in studies to date, neglecting the potential influence of national and global attachments and identities on energy beliefs and attitudes, despite the fact that large energy infrastructures are not only local in significance or function. To address this gap, survey data was collected from a representative sample of UK adults (N = 1519), capturing place attachments at local, national and global levels, climate change concern, beliefs about power lines and support for energy system change. Findings show significant differences in infrastructure beliefs and attitudes depending upon relative strength of attachments at different levels, controlling for personal characteristics such as age and party affiliation. Analyses of variance revealed that individuals with stronger national than local or global attachments were less likely to support European grid integration; those with relatively stronger global attachment were most likely to support decentralised energy and those with relatively stronger local attachment were most likely to protest against a nearby power line. In addition, those with strong attachments at local, national and global levels were most willing to reduce energy demand, and those with weak attachments were least likely to trust grid companies. Relatively stronger global than national attachment was positively associated with support for decentralised energy, with this effect partially mediated by climate change concern. Explanations for the findings and implications for future research are discussed.

Keywords

Place attachment, climate change, energy infrastructure, social acceptance.

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Research on place attachments and identities has made an important contribution to understanding social acceptance of low carbon infrastructure, which are often objected to by local communities. However, a focus on local attachments predominates in studies to date, neglecting the potential role of national and global attachments and identities on energy beliefs and attitudes, despite the fact that large energy infrastructures are not only local in significance or function. To investigate this, survey data was collected from a representative sample of UK adults (N = 1519), capturing place attachments at local, national and global levels, climate change concern, beliefs about power lines and support for energy system change. Findings show significant differences in infrastructure beliefs and attitudes depending upon relative strength of attachments at different levels, controlling for personal characteristics. Analyses of variance revealed that individuals with stronger national than local or global attachments were less likely to support European grid integration; those with relatively stronger global attachment were most likely to support decentralised energy and those with relatively stronger local attachment were most likely to protest against a nearby power line. In addition, those with strong attachments at local, national and global levels were most willing to reduce energy demand, and those with weak attachments were least likely to trust grid companies. Relatively stronger global than national attachment was positively associated with support for decentralised energy, with this effect partially mediated by climate change concern. Explanations for the findings and implications for future research are discussed.

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1. Introduction

Policies to mitigate climate change are leading to widespread changes to energy systems. Low carbon energy projects, such as wind farms and nuclear power stations, along with associated grid infrastructure such as transmission power lines, produce significant environmental and social impacts and typically meet with strong objections from affected communities that is often dubbed 'NIMBYism' (Not In My Back Yard, Dear, 1992). In recent years, researchers have strongly critiqued the NIMBY concept as a way of describing and explaining local responses (e.g. Wolsink, 2006; Devine-Wright, 2011; Burningham et al., 2015) and proposed alternative lines of inquiry that are less pejorative and more empirically grounded.

One of these is the place-based approach (Devine-Wright, 2009), which begins with the premise that particular locations are characterised by multiple attributes (Agnew, 1987): physical coordinates, social relations and emotional bonds referred to as place attachments (Altman and Low, 1992). Research has shown that place attachments are important in explaining social acceptance of energy proposals. For example, local residents with strong place attachments are likely to object to an energy project that is interpreted to be 'out of place' (e.g. to 'industrialise' a rural place typically regarded as 'natural' - Vorkinn and Riese, 2000; McLachlan, 2009; Devine-Wright and Howes, 2010; Batel et al., 2015). However, if proposals are interpreted to maintain or promote place distinctiveness and historical continuity, then local residents with strong place attachments are likely to give support (e.g. Devine-Wright, 2011a,b; Venables et al, 2014). It has also been shown that place attachments can influence support for smaller scale, community-led energy projects (van Veelen and Haggett, 2016).

Despite these insights, the literature on place attachment and social acceptance of low carbon energy can be critiqued for adopting a narrow spatial focus, solely addressing attachments with the places or sites where energy projects are proposed or constructed. This approach rests upon two implicit assumptions. First, that energy infrastructure projects are *only* local in character. Second, that local places are the *only* places that people feel a sense of attachment with. Both of these assumptions are questionable, particularly in the case of energy infrastructure linked with low carbon energy projects and the target of this research - high voltage power lines – whose function transcends any one specific locality by supplying electricity as part of a 'national grid'.

Similarly to large-scale low carbon energy projects, proposals to construct new power lines often meet with strong local objections in many countries, including the US, Sweden, Norway, Germany, the UK and Ireland (e.g. Priestley and Evans, 1992; Zoellner et al, 2008; Soini et al., 2011; Aas et al., 2014). Although research into social acceptance of power lines has been rather neglected (see Devine-Wright and Batel 2013), existing research suggests that, when thinking about power lines generally, people tend to perceive them as necessary to transmit power and guarantee security of supply; on the other hand, locally, they are perceived as impacting negatively on environmental (e.g. landscape aesthetics), social (e.g. health concerns from electro-

magnetic fields) and economic dimensions (e.g. property values) (e.g. Porsius et al., 2015).

Findings reported here arise from a study of beliefs about high voltage power lines with a nationally representative survey of UK adults (n=1519). Over £100 billion investment in grid networks is forecast for the next decade to connect new low carbon energy projects to the grid and to upgrade existing lines (Department of Energy and Climate Change, 2011). Therefore, understanding public beliefs about power lines is of strong importance for the achievement of climate mitigation targets. To address the narrow spatial focus in past research, this study aimed to investigate for the first time how local *and* non-local place attachments influence public beliefs and attitudes towards energy infrastructure.

2. Social acceptance of energy infrastructures: elaborating the place-based approach

Low carbon energy projects (e.g. wind farms) and associated infrastructure (e.g. high voltage power lines) generate significant environmental, social and economic impacts. This has led to strong community opposition (Wustenhagen et al., 2007) that is often termed 'NIMBYism' (Not In My Back Yard; Dear, 1992). Over the past 15 years, the NIMBY concept has been strongly critiqued as an appropriate way to describe and explain local responses to proposals for siting energy projects (e.g. Devine-Wright, 2005; Wolsink, 2006; McLymont and O'Hare, 2008; Bell et al., 2013). Several pathways of subsequent research can be identified that recognize the importance of different types of factor upon acceptance (see also Devine-Wright, 2008; Devine-Wright 2013). Personal factors include individuals' socio-demographic characteristics such as age and gender, as well as underlying political, social and environmental beliefs and values such as political orientation and attitudes towards climate change (e.g. Firestone, Kempton and Krueger, 2009; Swofford and Slattery, 2010). Project-related factors include levels of trust in the organization instigating development (Midden and Huijts, 2009); procedural justice in the way decisions are taken (Gross, 2007) and distributional justice in the ways that costs and benefits are allocated between actors (Walker, Cass and Devine-Wright, 2010). Finally, a place-based pathway focuses upon the location in which energy projects are sited, in particular local residents' emotional attachments to this place, as well as how the meanings associated with the place and the technology proposals are interpreted to 'fit' together (or not) (see Vorkinn and Riese, 2001; McLachlan, 2009; Devine-Wright, 2009). This study aims to inform this latter pathway.

Place is a key concept in human geography and cognate disciplines such as environmental psychology and sociology, land-use planning and architecture (Cresswell, 2003) and can be understood as a location that holds meaning for an individual or group (Tuan, 1977). How people relate to a particular place is informed by two distinct yet inter-related concepts (Hernandez et al., 2007): place attachment (Altman and Low, 1992) and place identity (Proshansky et al., 1983). Place attachments are emotional bonds with a place - as Rubinstein and Parmelee suggest: '*Attachment to place is a set of feelings about a geographic location that emotionally*

binds a person to that place as a function of its role as a setting for experience' (1992:139). Place identity refers to the ways in which physical and symbolic attributes of certain locations contribute to an individual or group's sense of identity (Proshansky et al., 1983). Research has suggested that people-place bonds are typically unconscious until rendered salient, for example by changes to a place or relocation from one place to another (Brown and Perkins, 1992; Giuliani, 2003).

Numerous studies have shown the relevance of people-place bonds for explaining acceptance of low carbon energy projects and associated infrastructure, including hydro-electricity (Vorkinn and Riese, 2001); offshore wind energy (Devine-Wright and Howes, 2010); wave energy (McLachlan, 2009); tidal energy (Devine-Wright, 2011a,b); nuclear power (Venables et al., 2014) and power lines (Devine-Wright, 2013). A consistent finding is that when proposals are interpreted as a threat to a place (e.g. when projects are interpreted to 'industrialise' rural landscapes hitherto perceived as 'natural'), then local residents who are strongly attached to the place are more likely to object (Vorkinn and Riese, 2000; Woods, 2003; McLachlan, 2009; Devine-Wright and Howes, 2010). By contrast, when proposals are interpreted to maintain or positively promote place character, then local residents with strong place attachments are likely to hold supportive attitudes (e.g. Devine-Wright, 2011a,b; Venables et al, 2014). For example, a study of local responses to a tidal energy project in Northern Ireland showed that residents with higher levels of attachment to two nearby villages were more likely to support the tidal project, associated with the belief that the project fostered local distinctiveness by 'putting them on the map worldwide' (Devine-Wright, 2011a,b).

Although these studies provide insight, they are limited by a 'localist' focus upon connections with the place where a project is sited. Whilst this is undoubtedly relevant, it is based upon two questionable assumptions. First, it presumes that energy infrastructure projects are *only* local in character. Second, it presumes that local places are the *only* places that people value and form relations of belonging with. Both of these assumptions are challenged below.

The spatial character of low carbon energy infrastructure

Low carbon energy infrastructures are *not just local* projects. Whilst having obvious local materiality and impact (Pidgeon and Demski, 2014), they implicate relationships and concerns at multiple spatial scales, notably the national and the global (Bridge et al., 2013; Batel and Devine-Wright, 2015). In terms of 'need', the primary rationale for transitioning from fossil-fuel to low carbon energy is to mitigate the impacts of a global scale environmental problem – climate change. In terms of ownership, projects may be state-led, or proposed by multinational companies with little if any connection to the locality where they are constructed, and may be supported (as well as objected to) by networks of objectors that include both local and non-local actors (Escobar, 2001; Gilmartin, 2008). In terms of discourse, infrastructure projects are often framed by governments as 'nationally significant' and decided upon at a national rather than local level. For example, in the UK, under the terms of recent legislation (the 2008 Planning Act and the 2011

Localism Act), wind farms over 50MW are decided upon by national government; by contrast, decisions on smaller scale energy projects are taken by local municipalities.

These have implications for discourses of objection. Haggett (2008) argued that wind energy projects lead to a disjuncture between (local) cost and (national and global) benefits. Ellis et al. (2007) identified several support and objector discourses in a study of responses to a proposed offshore wind farm, including 'rationalising globally, sacrificing locally', a discourse that proposed action on (global) climate change and a willingness to sacrifice (local) views. A study of stakeholder responses to wave energy revealed that arguments were made about the spatiality of project benefits, emphasizing national and international aspects (i.e. the significance of the project for the country as a whole) over local or regional issues: '*The Wave Hub isn't about Cornwall and the South West, it is about the whole of the UK and maintaining the leading position the UK has already got'* (McLachlan, 2009: 5346). These interconnections between local, national and international levels were further revealed in a recent study of public discourse about the siting of power lines, which revealed how publics drew on a set of colonial narratives based upon unequal power relations within the UK (e.g. between Wales and England) and between the UK and other countries (Batel and Devine-Wright, 2017). Collectively, these studies suggest that low carbon energy projects cannot be viewed solely in local terms when studying their social acceptance. As such, they suggest the need to investigate place attachments, and related identities at multiple spatial scales in order to more fully understand social acceptance of infrastructure proposals.

People-place relations at multiple scales

Research on people-place relations has shown that local attachments and identities are not the whole story. First, individuals may feel weakly attached or even alienated from the place where they currently live (Manzo, 2005; Lewicka, 2011). In this sense, proximity may not equate with belonging, as has sometimes been simplistically assumed in relation to climate change impacts (Breugger et al., 2015). Second, people may feel strongly attached to other localities, including places where they have lived in the past that are associated with feelings of nostalgia (Gustafson, 2014; Lewicka, 2014). Third, people-place relations encompass feelings of belonging with 'imagined communities' (Anderson, 1983) that implicate social and place identities beyond the local – for example at regional, national and even global levels (Feitelson, 1991; Devine-Wright and Lyons, 1997; Devine-Wright, 2013; Devine-Wright et al., 2015), as noted by an early place scholar: '*At one extreme a favourite armchair is a place, at the other extreme the whole earth'* (Tuan, 1977, 149).

Studies of people-place relations at distal scales have become more prevalent in recent years, with interest in the impacts of globalization upon identities (Arnett, 2002), concern about an exclusionary politics of local attachment (Fried, 2000; Massey, 2005) and the emergence of global identities or cosmopolitanism (Leung, Koh and Tam, 2015). For example, Laczko (1995) investigated attachments to neighbourhood, town/city, province, country and continent scales in 24 countries. Results showed that national belonging was strongest in all countries bar two (Spain, The Philippines) with continental belonging weakest in 17 countries. Gustafson

(2009) studied ways that place attachments at local, regional, national and European scales associated with work-related mobility. Findings showed that 'frequent travellers' (those who travelled internationally several times each year for work) showed higher levels of European belonging than 'non-travellers' (those who did not travel outside of Sweden for work), but were no less active within local clubs and organisations.

There is some evidence that self-identification at the global scale underpins public engagement with climate change, and that this varies by national context. Katzarska-Miller et al. (2012) found positive, significant correlations between global identity and concern for global warming, but varying in strength when comparing data from participants in the US, Bulgaria and India. The importance of relational measures of identity has been emphasized by several studies. Running (2013) investigated four forms of self-identification (as 'global citizen', 'national citizen', 'local community member' and 'autonomous individual') and their association with the perceived seriousness of climate change, using data from fifty seven countries (n = 40,330). A combined global citizen/autonomous individual variable was significant in predicting the perceived seriousness of climate change, controlling for personal characteristics, in a regression analysis. A survey study with a representative sample of Australian adults found that individuals with stronger global than national belonging were significantly more likely to view climate change as personally relevant, to express higher levels of concern and to be more likely to regard climate change as an anthropogenic problem (Devine-Wright, Leveson and Price, 2015)

These findings indicate that people form relationships of belonging beyond the local places where they currently live, potentially including the 'whole Earth' (Tuan, ibid) that are important for their sense of identity (Katzarska-Miller et al., 2012). Second, *discrete* levels of belonging, whether at local, national or global scales, may be less important than *relative* levels of belonging between scales (e.g. local in comparison to national or global, and vice-versa). A relational approach to people-place bonds reflects different ways in which individuals choose to identify themselves (e.g. as local protectors, national citizens, cosmopolitans) in order to maintain a positive sense of identity, understand change and take action (Jaspal, Nerlich and Cinnarella, 2014). Third, although belonging at the national level is typically strongest, the relative strength of place attachments and identities at sub-national and supra-national scales varies across national contexts (Laczko, ibid; Katzarska-Miller et al., ibid). Therefore, it is important to note that place-related meanings (in this case, how 'local', 'national' and 'global' belonging is interpreted) are socially constructed and likely to change over time (Williams, 2013; Herod, 2013). Fourth, given the relevance of global place attachments and identities for climate change concern (Feitelson, 1991; Devine-Wright et al., 2015), it is likely that such processes might also influence beliefs about low carbon energy projects and related infrastructures. Finally,

This study focused on a form of energy infrastructure - high voltage power lines – that has generated intense local opposition in many countries, including the US, Norway, Germany, the UK and Ireland (e.g. Pidgeon and Demski 2012; Devine-

Wright, 2013). This is of high policy significance - in the UK, for example, large investments (estimated at over £100 billion) in grid networks are forecast for the next decade, arising from the need to accommodate a series of systemic changes including variable generation from renewable energy projects (Department of Energy and Climate Change, 2011). Existing research on community acceptance of power lines suggests that, when thinking about power lines generally, people tend to perceive them as necessary to transmit power and guarantee security of supply (Devine-Wright and Devine-Wright. 2009); on the other hand, locally, they are perceived as impacting negatively on landscape aesthetics, upon health due to electro-magnetic fields, wildlife, and associated issues such as tourism and property values (Elliot & Wadley, 2002; Devine-Wright & Batel, 2013; Cotton and Devine-Wright, 2013). Arising from these concerns, public responses to high voltage power lines bear similarity to responses to low carbon energy projects such as wind farms or bioenergy power stations.

The primary aim of the study was to reveal how multiple attachments (at local, national and global levels) influence public beliefs about high voltage power lines, as well as various forms of systemic change, including transitions from national to supra-national grid networks at the European level, and a shift from large-scale energy systems to smaller decentralised energy technologies. Given the literature cited, we expected that individuals with relatively stronger attachment at the national level in comparison to local or global levels (dubbed *'Nationals'*), would have the most positive beliefs about high voltage power lines, have higher trust in grid companies, and be less likely to protest against new line proposals. We expected individuals with relatively stronger attachment at the local level (dubbed *'Locals'*) would be more willing to recognise negative impacts and to take action against a new local proposal. Third, we expected individuals with relatively stronger attachment at the global level (dubbed *'Globals'*) to support grid lines associated with the local carbon energy transition. In addition to these, an exploratory approach was taken with forms of attachment overlooked by social acceptance research to date: individuals with high levels of belonging at all scales (dubbed *'Glocals'*) and individuals with low levels of belonging at all scales (dubbed '*Nocals*'). The following research questions guided the analyses:

1. To what extent do individuals feel attached to places at multiple scales, from the neighbourhood where the live to the whole Earth? More specifically, what is the relationship between place attachments (used as a label for the remainder of this paper to encompass attachment bonds and place-related identities, cf. Manzo and Devine-Wright, 2013) at neighbourhood, country and global scales?

2. In what ways do place attachments relate to beliefs about high voltage power lines including trust, general and local attitudes, and willingness to take action against nearby proposals, as well as support for energy system change?

3. How do individuals' personal characteristics relate to place attachments at different spatial scales? More specifically, is climate change concern related to stronger global place attachment? Additionally, can the relationship between place

attachment and support for decentralised energy be accounted for, or mediated by, climate change concern?

3. Method

3.1 Procedure and sample

A survey tool was used to examine public beliefs and attitudes, conducted online in January 2012 to collect data from a sample of 1519 residents (aged 18+) that were representative of the UK adult population by age, gender, socio-economic classification and region, according with the 2001 Census (see Table 1).

Table 1 – Sample characteristics

	Category	%
Gender	Female	48.1
	Male	51.9
Age	18-29	23.2
	30-39	14.1
	40-49	19.6
	50-59	16.3
	60-69	13.3
	> 70	13.5
Educational qualifications	None	10.8
	GCSE/O level	23.7
	A level	27.5
	Undergraduate degree	23.7
	Postgraduate degree	12.6
Socio-economic grade	DE	32.6
	C2	14.4
	C1	31.6
	AB	21.4

3.2 Survey questions and measures

Place attachments at local, national and global scales were captured using wording similar to Gustafson (2009) and Devine-Wright et al. (2015). Participants were asked: '*To what extent do you feel a weak or a strong sense of belonging to the following areas?'* with responses focusing upon three places: 'The neighbourhood where you live', 'Britain' and 'The Earth/The whole world'. Response options for each question varied on a 5-point Likert-type scale from 1 (No sense of belonging) to 5 (Very strong sense of belonging).

General attitudes towards high voltage power lines were captured using three items, following wording used in previous studies (cf. Devine-Wright and Batel, 2013; e.g. *I am in favour of overhead power lines generally)*. Analysis, using Cronbach's alpha,

indicated a favourable level of reliability for the three items when aggregated (0.85). For each item, questions were answered from 1 (Strongly Agree) to 5 (Strongly Disagree). Perceived impacts of high voltage power lines were measured using thirteen items. Principle components analysis indicated three underlying factors that were used to devise multi-item scales. 'General impacts' consisted of 9 items referring to issues of landscape and health impacts, with a Cronbach's alpha of 0.92; 'Energy security' consisted of two items that referred to ways that power lines promote security of supply (e.g. *Ensure safe and stable delivery of electricity*; Pearson's r = .69, n=1230, p<.000) and 'Economic benefits' consisted of two items that referred to how power lines might have positive economic impacts (e.g. *Provide jobs in construction and maintenance of the powerline;* Pearson's r = .25, n=1155, p<.000). All items were measured using responses from 1 (Strongly Agree) to 5 (Strongly Disagree).

Trust in the Grid Operator was captured using the question '*How much trust do you have in this organisation (i.e. their arguments for new power lines)?'* and responses ranged on a 5-point Likert-type scale from 1 (Do not trust at all) to 5 (Trust completely). Future energy system beliefs were measured using four items. Two referred to changing socio-technical configurations – support for a shift to decentralised, renewable energy; and support for a European-wide 'super grid'. Other items referred to support for ways of avoiding the building of new power lines (i.e. willingness to accept the increased possibility of blackouts; and willingness to reduce my use of electricity). In each case, responses were measured on a five point scale from 1 (Strongly disagree) to 5 (Strongly agree).

Local attitudes towards power lines were captured using two questions: "*To what extent would you support the building of a new high voltage power line in the area near to where you live (i.e. within 3 miles)?"* with responses from 1 (Strongly oppose) to 5 (Strongly support); and '*To what extent would you accept the construction of a new high-voltage power line near your community (for example, within 3 miles)?*' with responses from 1 (Not at all accept) to 5 (Strongly accept). These were based on previous research that has shown a distinction between support and acceptance of energy technologies (Batel et al., 2013; Devine-Wright, 2013; Devine-Wright & Howes, 2010).

Willingness to take action was captured by asking how likely participants would be to take specific protest or support actions in response to a proposal to site a new power line nearby (i.e. within 3 miles). Actions were grouped in terms of willingness to take two supportive actions (signing a support petition, writing a supportive letter to a local paper, Pearson's r = .66, n = 1519, p<.000) or to take five protest actions (e.g. signing a petition against the proposal, attending a protest meeting, with a Cronbach's alpha reliability of 0.94). Responses for both measures ranged from 1 (Very unlikely) to 5 (Very likely). Climate change concern was measured using three items (e.g. *I worry a great deal about climate change*, with a Cronbach's alpha reliability of 0.90) and response options ranging from 1 (Strongly disagree) to 5 (Strongly agree).

Finally, personal aspects were captured by questions probing participants' age, gender, educational attainment, party affiliation (measured by asking what party would you vote for tomorrow if there was a general election) and socio-economic grade[1].

4. Findings:

4.1: To what extent do individuals feel attached to places at multiple scales?

Descriptive statistics indicated mean levels above the mid-point for place attachment at local, national and global scales, with national attachment strongest (M = 3.63, *SD* = 1.13) and global attachment weakest (M = 3.34; *SD* = 1.21) (see Table 2). To examine relations amongst place attachments, bivariate correlations were computed. Positive correlations were observed, suggesting complementary rather than contradictory relations. Strength of associations were moderate overall, suggesting an effect of proximity, with global scale place attachment more strongly correlated with national attachment, and less strongly correlated with local attachment. In comparison to previous research, mean levels of attachment were lower in comparison to data collected from a representative sample of Australian adults (Devine-Wright et al., 2015), national attachment was similarly strongest, but in this case, global attachment weaker.

Table 2: Descriptive data and bivariate correlations for multiple place attachments.

	Mean (sd, n)	Local attachment	National attachment	Global Attachment
Local attachment	3.39 (1.16, 1472)	1	.365**	.225**
National attachment	3.63 (1.13, 1472)		1	.362**
Global attachment	3.34 (1.21, 1433)			1

Relative strength of place attachment at multiple levels was examined, building on previous research concerning place attachments and climate change beliefs. A two-stage process was conducted, following the approach of Devine-Wright et al. (2015). First, three continuous variables were created by subtracting scores at global,

[1] Socio-economic grade is calculated based on the occupation of the chief income earner in the household. Grade A corresponds to upper middle class, based on higher managerial, administrative or professional occupations. Grade B is based on intermediate managerial, administrative or professional occupations. Grade C1 corresponds to supervisory or clerical work, and junior managerial, administrative or professional occupation. Grade C2 corresponds to skilled working class, based on an occupation of skilled manual workers. Grade D is working class, related with semi and unskilled manual workers. Finally, Grade E corresponds to those at lowest levels of subsistence, that is, casual or lowest grade workers, pensioners and others who depend on the welfare state for their income. In this study, the grades were grouped as follows: AB, C1, C2 and DE.

national and local levels from each other, with each variable scored from -4 to +4. This produced: a 'global relative to national' variable where positive scores represent a greater sense of attachment at the global level, negative scores represent greater attachment at the national level and a score of zero reflects similar scores on both; a 'global relative to local' variable where positive scores represent a greater sense of attachment at the global level, negative scores represent greater attachment at the local level and a score of zero reflects similar scores on both; and a 'national relative to local' variable where positive scores represent a greater sense of attachment at the national level, negative scores represent greater attachment at the local level and a score of zero reflects similar scores on both.

Following this, a categorical variable was devised with five subgroups: (1) the 'Local' subgroup consisted of those with comparatively stronger local attachment in comparison to national *and* global levels (i.e. those for whom local/national belonging > 0 and local/global belonging > 0); (2) the 'National' subgroup consisted of those with comparatively stronger national attachment in comparison to global *and* local levels (i.e. those for whom national/local belonging > 0 and national/global belonging > 0); (3) the 'Global' subgroup consisted of those with comparatively stronger global attachment in comparison to local *and* national levels (i.e. those from whom Global/local belonging > 0 AND Global/national belonging > 0); (4) the 'Glocal' subgroup consisted of those individuals with strong attachments at local *and* national *and* global levels (i.e. those with scores of 4 or 5 on the 5 point scale for all three items); the 'Nocal' subgroup consisted of individuals with weak levels of attachment at local *and* national *and* global levels (i.e. those with scores of 1 or 2 on the 5 point scale for all three items). Subsequent analyses investigated differences between the subgroups on beliefs and attitudes towards energy infrastructures.

4.2: What are the personal characteristics of place attachment subgroups?

For age, crosstabulation analysis indicated significant differences between groups (chi squared = 56.21, df20, p<.000, see Table 3). The 'Nocal' and 'Global' groups were significantly more likely to be younger (i.e. aged under 29) and the 'Glocal' group was more likely to be older (i.e. aged over 60).

Table 3: Age differences between place attachment subgroups

	18-29	30-39	40-49	50-59	60-69	70+	Total
'Nocals'	18 (34.6%)	9 (17.3%)	8 (15.4%)	8 (15.4%)	4 (7.7%)	5 (9.6%)	52
'Locals'	36 (16.4%)	44 (20.1%)	43 (19.6%)	39 (17.8%)	31 (14.2%)	26 (11.9%)	219
'Nationals'	43 (17.6%)	43 (17.6%)	50 (20.4%)	38 (15.5%)	44 (18%)	27 (11%)	245
'Globals'	45 (25.7%)	37 (21.1%)	35 (20%)	34 (19.4%)	17 (9.7%)	7 (4%)	175
'Glocals'	22 (13.3%)	22 (13.3%)	25 (15.1%)	33 (19.9%)	25 (15.1%)	39 (23.5%)	166
Total	164	155	161	152	121	194	857

For party affiliation, cross-tabulation analysis indicated significant differences between groups (chi-squared analysis = 93.72, df16, p<.000). Table 4 shows that the 'Nationals' subgroup were more likely to intend to vote for the Conservative party, the 'Global' subgroup were more likely to vote Labour, Liberal Democrat and to intend not to vote, and the 'Nocal' group were most likely to indicate 'would not vote' in comparison to the other subgroups.

Table 4: Differences in party affiliation amongst place attachment groups

	Conservative	Labour	Liberal Democrat	Scottish National Party	Would not vote	Total
'Nocals'	8 (21.1%)	16 (42.1%)	3 (7.9%)	0	11 (28.9%)	38
'Locals'	60 (38.5%)	48 (30.8%)	14 (9%)	16 (10.3%)	18 (11.5%)	156
'Nationals'	101 (56.4%)	47 (26.3%)	19 (10.6%)	2 (1.1%)	10 (5.6%)	179
'Globals'	18 (15.5%)	52 (44.8%)	18 (15.5%)	8 (6.9%)	20 (17.2%)	116
'Glocals'	54 (41.2%)	56 (42.7%)	12 (9.2%)	4 (3.1%)	5 (3.8%)	131
Total	241	219	66	30	64	620

There were no significant differences between the subgroups in relation to gender, social class and educational attainment. Since age and party affiliation strongly differentiated the five subgroups, all subsequent analyses controlled for the effects of these two variables, following the analytical approach of Lewicka (2011). A series of analyses of covariance were carried out for measures of energy infrastructure beliefs and attitudes, with place attachment as a factor (five levels) and age and party affiliation as covariates. All presented means are adjusted for differences in age and party affiliation. The conservative Bonferroni test was used in all cases to test significance of post-hoc contrasts.

4.3: To what extent does place attachment explain beliefs and attitudes about energy infrastructure?

4.3.1: General attitudes towards high voltage power lines

A one-way between groups univariate analysis of variance was conducted to investigate whether place attachment subgroups differed in general attitudes towards high voltage power lines. In the analysis, age and party affiliation were covariates, place attachment subgroup was the independent variable and general attitude towards power lines scale was the dependent variable. The difference between the place attachment subgroups on the dependent variable was not significant, $F(4, 541) = 1.10$, p<.356, partial eta squared = .008 (see Table 5 for estimated mean values).

4.3.2: Perceived Impacts of high voltage power lines

To investigate whether place attachment subgroups differed in perceived impacts of high voltage power lines, a one-way between groups multivariate analysis of variance was conducted, with age and party affiliation as covariates, to assess the effect of place attachment subgroup, as an independent variable, on three perceived impact measures as dependent variables (negative impacts, energy security and economic benefits). Multivariate outliers were excluded first based on critical values for Mahalanobis distance. There was a small statistically significant difference between the place attachment subgroups on the combined dependent variables, $F(12, 955) = 1.91$, $p<.030$, Wilks' lambda = .94, partial eta squared = .021. When taken separately, there was no statistically significant difference evident, however descriptive data shows that the 'Nationals' were least likely to agree that power lines produce negative impacts; they were also most likely to agree that power lines increase energy security in contrast to the 'Globals'. Finally, the 'Locals' group was least likely to agree that power lines brought economic benefits (see Table 5).

4.3.3: Trust in the Grid Operator

To investigate whether place attachment subgroups differed in levels of trust in the grid operator, a one-way analysis of co-variance was conducted, with age and party affiliation controlled for, to assess the effect of place attachment subgroup, as an independent variable, on trust as a dependent variable. The difference between the place attachment subgroups on the dependent variable was significant with a medium effect size, $F(4, 506) = 4.51$, $p<.001$, partial eta squared = .034. Bonferroni tests indicated that the 'Nocal' group were significantly less likely to trust the system operator in comparison to both the 'National' ($p<.003$) and 'Glocal' groups ($p>.010$; see Table 5 for estimated mean values).

4.4.4: Attitudes towards the siting of power lines nearby to where you live

To investigate whether place attachment subgroups differed in local attitudes towards power lines, a one-way between groups multivariate analysis of variance was conducted, with age and party affiliation as covariates, to assess the effect of place attachment subgroup, as an independent variable, on two local attitude measures as dependent variables (support for a nearby power line, acceptance of a nearby power line). Multivariate outliers were excluded first based on critical values for Mahalanobis distance. There was no significant difference between the place attachment subgroups on the combined dependent variables, $F(4, 563) = 1.33$, $p<.224$, Wilks' lambda = .98, partial eta squared = .01. Estimated mean values are shown in Table 5.

Table 5: Descriptive data for power line attitudes by place attachment groups

	'Nocals' Estimated mean (n, SE)	'Locals' Estimated mean (n, SE)	'Nationals' Estimated mean (n, SE)	'Globals' Estimated mean (n, SE)	'Glocals' Estimated mean (n, SE)
General attitudes	3.29 (28, .17)	3.37 (138, .08)	3.41 (163, .07)	3.18 (102, .09)	3.29 (117, .08)
Impact beliefs					
Negative impacts	3.62 (18, .30)	3.47 (96, .09)	3.36 (111, .08)	3.49 (69, .10)	3.69 (76, .10)
Energy security	3.62 (18, .20)	3.68 (96, .09)	3.70 (111, .08)	3.39 (69, .10)	3.68 (76, .10)
Economic benefits	3.74 (18, .18)	3.39 (96, .08)	3.45 (111, .07)	3.44 (69, .09)	3.64 (76, .09)
Trust					
Grid operator	2.22 (24, .19)	2.68 (135, .08)	2.96 (157, .08)	2.70 (92, .10)	2.92 (105, .09)
Local siting beliefs					
Support	2.18 (33, .20)	2.39 (146, .09)	2.42 (160, .08)	2.49 (100, .11)	2.38 (124, .10)
Acceptance	2.21 (33, .19)	2.55 (146, .09)	2.70 (160, .09)	2.66 (100, .11)	2.53 (124, .10)
Future system beliefs					
Accept blackouts	2.28 (27, .22)	2.20 (123, .10)	1.93 (153, .09)	2.16 (91, .12)	2.46 (99, .11)
Reduce my demand	2.84 (27, .22)	2.94 (123, .10)	2.86 (153, .09)	3.13 (91, .12)	3.22 (99, .11)
Decentralise energy	3.02 (27, .22)	3.16 (123, .10)	2.93 (153, .09)	3.50 (91, .12)	3.32 (99, .12)
European supergrid	1.89 (27, .25)	2.34 (123, .12)	2.25 (153, .12)	2.61 (91, .14)	2.60 (99, .1.3)
Willingness to take action in response to a local proposal					
Support actions	1.55 (33, .18)	1.72 (146, .08)	1.64 (160, .08)	1.83 (100, .10)	2.11 (124, .09)
Protest actions	1.89 (33, .22)	2.52 (146, .10)	2.17 (160, .09)	2.42 (100, .13)	2.82 (124, .11)

4.4.5: Beliefs about energy system change

To investigate whether place attachment subgroups differed in beliefs about future energy systems, a one-way between groups multivariate analysis of variance was conducted, with age and party affiliation as covariates, to assess the effect of place attachment subgroup, as an independent variable, on four system items as dependent variables (support for a European 'supergrid', support for decentralized energy, willingness to accept blackouts, willingness to reduce personal demand). Multivariate outliers were excluded first based on critical values for Mahalanobis distance. There was a small statistically significant difference between the place attachment subgroups on the combined dependent variables, $F(16, 1476) = 2.44$, $p<.001$, Wilks' lambda = .92, partial eta squared = .02.

When the results of the dependent variables were considered separately, small to moderate statistically significant differences were observed for two of the four variables, using a Bonferroni adjusted alpha level of .012 (Table 5). For support for a shift from centralized to decentralized, renewable energy systems, a moderate significant difference was found, $F(4, 486) = 4.13$, $p<.003$, partial eta squared = .033. Bonferroni tests indicated that the 'National' group was significantly less willing to support smaller scale energy systems in comparison to the 'Global' group (mean values: 2.93 vs. 3.50; $p<.002$) and approaching significance in comparison to the 'Glocal' group (2.93 vs. 3.32; $p<.083$). A significant difference was found between the subgroups' willingness to accept blackouts, $F(4, 486) = 3.67$, $p<.006$, partial eta squared = .029. Bonferroni tests indicated that the 'National' group was significantly less willing to accept blackouts in comparison to the 'Glocal' group (mean values: 1.93 vs. 2.46; $p<.002$).

For support for a European 'supergrid', the univariate test approached the corrected p value ($p<.020$). Estimated mean values indicated that 'Nocal' and 'National' subgroups were least willing to accept a European grid (mean values of 1.89 and 2.34), and the 'Global' and 'Glocal' groups most willing (mean values of 2.61 and 2.60). For willingness to reduce personal demand, the univariate test approached the corrected p value ($p<.099$). Estimated mean values followed a similar trend to the other items, with the 'Nocal' and 'National' subgroups least willing to reduce personal demand to avoid the construction of new power lines (mean values of 2.84 and 2.86), and the 'Global' and 'Glocal' groups most willing (3.13 and 3.22).

4.4.6: Willingness to take action if a power line was proposed nearby

To investigate whether place attachment subgroups differed in willingness to take action in response to proposals to construct a nearby power line, a one-way between groups multivariate analysis of variance was conducted, with age and party affiliation as covariates, to assess the effect of place attachment subgroup, as an independent variable, on two willingness to act measures as dependent variables. Multivariate outliers were excluded first based on critical values for Mahalanobis distance. There was a moderate significant effect for the place attachment subgroups on the combined dependent variables, $F(4, 536) = 4.64$, $p<.000$, Wilks' lambda = .93, partial eta squared = .034. When the results of the dependent variables were considered separately, small to moderate statistically significant

differences were observed for the two variables, using a Bonferroni adjusted alpha level of .025 (see Table 5).

For willingness to take action in support of a proposed power line, a moderate significant difference was found, $F(4, 529) = 4.72$, $p<.001$, partial eta squared = .034 . Bonferroni tests indicated that the 'Glocal' group were significantly more likely to take action in support of a new line in comparison to the 'Local' group ($p<.016$) and the 'National' group ($p<.001$) and approaching significance for the 'Nocal' group ($p<.055$). For willingness to take protest actions, a moderate significant difference was found, $F(4, 529) = 6.52$, $p<.000$, partial eta squared = .047. Bonferroni tests indicated that the 'Glocal' group were significantly more likely to protest against new lines in comparison to the 'Nocal' group ($p<.002$) and the 'National' group ($p<.000$). The difference between the 'Local' group, being more prepared to protest in comparison to the 'Nocal' group, approached significance ($p<.087$).

4.5: Do place attachment subgroups differ in climate change concern?

To investigate whether place attachment subgroups differed in climate change concern, a one-way between groups analysis of variance was conducted, with age and party affiliation as covariates, to assess the effect of place attachment subgroup, as an independent variable, upon climate change concern. Analysis of co-variance revealed a moderate significant effect of place attachment subgroups on climate change beliefs, $F(4, 542) = 7.56$, $p<.000$, partial eta squared = .053. Bonferroni tests revealed that the 'Global' subgroup was significantly more concerned about climate change in comparison to the 'Local' ($p<.013$) and 'National' ($p <.000$) subgroups, and approaching significance in comparison to the 'Nocal' subgroup ($p<.068$). In addition, the 'Glocal' subgroup were significantly more concerned about climate change in comparison to the 'National' subgroup ($p<.001$) and approaching significance in comparison to the 'Local' subgroup ($p<.087$).

Table 6: Levels of climate change concern for the place attachment groups

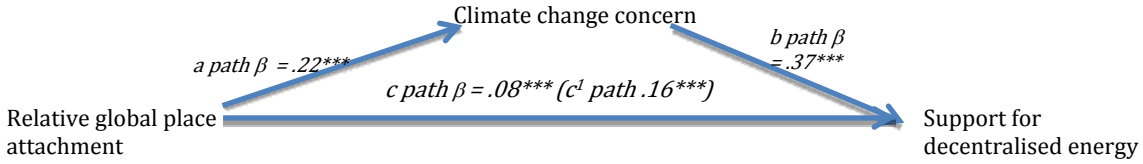
	Mean (adjusted)	n	Std. error
'Nocals'	2.67	29	.21
'Locals'	2.84	137	.10
'Nationals'	2.67	160	.09
'Globals'	3.32	106	.11
'Glocals'	3.22	117	.11

4.5.1: Is the relation between place attachment and support for decentralizing energy systems mediated by climate change concern?

Given the results indicating higher levels of climate change concern for individuals with stronger global belonging and weaker concern for individuals with strong national belonging, further analyses were conducted to test whether climate change concern mediated the relationship between global relative to national place attachment (as a continuous variable) and climate change concern. The outcome

variable was a three item measure of concern for climate change. Multiple regression analyses were conducted to assess each component of the proposed mediation model. First, it was found that relative global/national attachment was positively associated with support for decentralised energy (β=.08, t(2, 1202) = 2.98, p<.000). This indicates that stronger individuals with stronger global than national attachment were more likely to support a shift towards decentralised, renewable energy. Second, relative global/national attachment was positively related to climate change concern (β=.37, t(1, 1203) = 8.31, p<.000). Third, results indicated that climate change concern was positively associated with support for decentralized energy (β=.37, t(2, 1202) = 12.05, p<.000). Figure 1 shows that the overall model was significant as well as a significant direct effect of relative global/national attachment on climate change concern (*a path)*. There was also a significant direct effect of climate change concern on support for decentralised energy (*b path)*. Bootstrapping test (Preacher and Hayes, 2004, 2008) indicated a significant indirect effect of climate change concern upon support for decentralised energy revealing a mediation effect. The mediation effect was partial, as the total direct effect of global/national place attachment on support for decentralised energy (*c path*) decreased but remained significant when controlling for the mediator (c^1 *path*).

Figure 1: Indirect effect of relative global place attachment on support for decentralising energy through climate change concern



F(2, 1202) = 95.71***, R^2 = 0.16

Climate concern *ab path*: β = 0.08; 95% CI = 0.06; 0.11
Total *c path*: β = 0.16; 95% CI = 0.11; 0.21

5. Discussion

This study aimed to contribute to the literature on the social acceptance of low carbon energy infrastructure, and particularly the place-based approach (Devine-Wright, 2009). A key weakness of the literature to date is a localist focus upon the areas near to where people live, which overlooks non-local spatialities of energy infrastructure (Bridge et al., 2013) and the possible role of people-place relations at non-local levels (Devine-Wright, 2013), relations that have already been shown to be significant in influencing climate change beliefs (Devine-Wright et al., 2015). To address this gap, this study investigated for the first time the impacts of relative levels of local, national and global attachments in explaining public beliefs about, and responses towards, high voltage power lines and future energy systems drawing

on a nationally representative sample of UK adults. Significant differences were found between the subgroups, after controlling for age and party affiliation, for several aspects of infrastructure beliefs and attitudes. The findings extend the results of past studies that have consistently shown the role of local place attachments in influencing social acceptance (Vorkinn and Riese, 2000; Devine-Wright and Howes, 2010; Devine-Wright, 2011a; Devine-Wright, 2013; Venables et al., 2014).

The study produced novel findings in relation to individuals that indicated stronger national than local or global attachments (i.e. participants dubbed 'Nationals'). This group had highest levels of trust in the grid system operator, lowest levels of climate change concern, and were least willing to accept the possibility of blackouts to avoid constructing new power lines, as well as lowest willingness to support a Europe-wide grid network. Taken together, the findings suggest that these individuals were more likely to hold positive representations of energy infrastructures that are characterized as maintaining or enhancing national identity, and negative representations of energy infrastructures or actions that might be viewed as a threat to national identities, including the formation of supra-national grid networks and blackouts. For this group, power outages may symbolize the antithesis of a modern developed nation characterised by a reliable electricity system that will always 'keep the lights on' (Stevens, 2010). Moreover, these individuals may endorse an ecological modernization perspective on how to tackle environmental problems such as climate change (Barry, 1999) by favouring technological solutions that are implemented at the national level over alternatives at supra-national (e.g. an international 'super-grid') or individual levels (e.g. changes to consumption practices).

A second novel finding regards the impacts of stronger global than local or national belonging - i.e. individuals dubbed 'Globals' - who were also more likely to be young and hold left wing and centre party affiliation. This finding was particularly apparent in relation to beliefs about future energy systems. The global subgroup held more positive beliefs about decentralised energy technologies drawing upon renewable energy sources such as wind and solar, technologies that might signal a move away from centralised grid networks towards local networks of supply. That the global subgroup was significantly more in favour of energy decentralization as well as holding high levels of climate concern suggests that these individuals represent a move towards renewable energy sources as playing an important role in mitigating a global scale environmental problem – climate change. The 'Global' subgroup was also more likely to support the construction of a European 'supergrid' connecting national energy systems. While this might seem contradictory to support for decentralised energy, it may be rooted in similar beliefs about the value of moving away from nation-centered energy systems. It might also link to beliefs about the value of creating communities of interest across national boundaries. Previous research has indicated that individuals with stronger global than national belonging were more likely to view climate change as an opportunity to bring people together around the world for a common cause (Devine-Wright et al., 2015). A European

electricity grid may be viewed in a similar way as enabling greater cooperation and collaboration between nation states for the greater good of people internationally.

'Glocal' individuals held strong attachments at local, national *and* global levels and were characterized by higher willingness to take action, both in relation to demand (e.g. willingness to reduce personal demand to avoid constructing new power lines) and supply (e.g. willingness to protest and support new line proposals). This group were more likely to be older, to be supportive of a European grid network and hold high levels of climate change concern. The picture that emerges is of active individuals with global, national and local interests, similar to findings by Gustafson (2009) who found that individuals with high levels of European belonging were also likely to indicate high levels of local involvement, against assumptions about cosmopolitans lacking local interest. It may be that 'Glocal' individuals relate to their locality in a way described by Lewicka as 'active attachment' (2011; 2013), that is people who feel strongly attached to the locality where they live, even if they may not have lived there for very long, having intentionally relocated to that residence place in later life, who are actively involved in local affairs, and have high levels of cultural capital (Lewicka, 2013). Future research is required to examine this issue in more detail, as well as how the findings for 'global' and 'glocal' groups might relate to literature on 'Green on Green' conflicts over renewable energy siting (Warren et al., 2011), involving environmentalists that attach different priorities to local and global concerns.

In this study, individuals who held stronger local than national or global belonging (dubbed 'Locals') were least likely to take action in support of a nearby power line proposal and more likely to protest, as well as being less likely to agree that power lines bring economic benefits. While these findings support past research on local attachment (e.g. Vorkinn and Riese, 2001; Devine-Wright and Howes, 2010), they also suggest that many of the studies which in the past found a positive relationship between (local) place attachment and objections to infrastructure proposals may have been conflating the 'Glocal' and 'Local' forms of attachment described here. The findings suggest that differences between 'Glocals' and 'Locals' should be taken into account in future research.

Another novel finding concerns the 'Nocals' group, who indicated low levels of engagement with political and environmental issues, manifest by lowest levels of trust in the grid operator, lowest willingness to take action in terms of personal demand or nearby power line proposals, lowest support for a European grid and lowest levels of climate change concern. These individuals were more likely to be younger, left-wing and/or less willing to vote. This group shows similarity with recent sociological studies identifying a cohort of young adults in the UK that have relatively high levels of education, yet high levels of debt, poor prospects for stable employment and home ownership (Roberts and Allen, 2016). If so, the findings suggest the merit of future research to examine the environmental concerns of this group in further detail, as well as investigating how to enable greater participation in decision-making over the siting of low carbon energy infrastructures. One possible policy response might be to encourage this group to develop stronger local place

attachment, through local campaigns or incentives for home ownership, which may in turn foster greater political engagement more generally.

Despite the fact that increasing use of renewable energy sources is based upon climate mitigation policies, research into social acceptance of renewable energy projects has rarely focused upon the role of climate change beliefs. A few studies have shown a positive relation between climate change concern and support for wind energy (e.g. Swofford and Slattery, 2010). This study extends this literature by showing that support for a shift towards smaller scale energy systems that utilize renewable energy sources such as wind and solar, is partially influenced by both climate change concern *and* relative place attachment at global/national levels. This is an important finding, since it suggests multiple rationales for public support for decentralising energy systems that need to be investigated in greater depth by future studies. It is important that future research distinguishes between large-scale centralized and smaller-scale decentralized pathways of decarbonisation, as well as examining the full range of factors that shape support for decentralised, renewable energy. Although both centralised and decentralisd renewable energy result in reduced emissions, support for each may be founded upon different beliefs and values regarding the rescaling of energy systems (Bridge et al., 2013) and the role of publics in the local carbon transition (Walker and Cass, 2007).

There were several issues, notably in relation to general attitudes, local attitudes and perceived impacts, that indicated similarities across the subgroups. There are several possible reasons for this. First, these may be issues around which there is a large degree of consensus. For example, regardless of local or national attachments, individuals are reluctant to live near high voltage power lines, suggesting common views that this infrastructure is views as 'LULU' in the UK (locally unwanted land use, Armour, 1991). A second reason for similarities across subgroups might be that certain questions did not detail spatial issues sufficiently. For example, survey items on economic benefits referred to the provision of jobs in construction and maintenance, but did not specify where these benefits would arise. Future research can specify the spatiality of these issues more clearly in order to investigate further differences between place attachment subgroups. The study was based on single item measures of place belonging at multiple scales. Although this has been shown to discriminate between individuals (Devine-Wright et al., 2015), future research could develop multiple items to measure attachment at each spatial level, for example distinguishing between environmental and social dimensions (Hidalgo and Hernandez, 2001).

Future research could employ qualitative methods (e.g. focus groups, in-depth interviews) in contexts of infrastructure siting to explore the spatial framings employed by different actors and how local residents interpret these framings. This would shed light on the socially constructed nature of place-related meanings (Williams, 2014) and representations of place-technology 'fit' (Batel et al., 2015). This is important since survey findings may be understood to suggest that place attachments and place meanings are fixed entities and essentialised in particular ways. Instead, it is likely that individuals are both aware of and able to strategically

select from multiple ways of justifying or contesting energy infrastructure projects in relation to local, national and global scales (cf. Batel and Devine-Wright, 2017), as well as multiple ways of positioning themselves in relation to those same spatialities (e.g. as a local custodian, global citizen or national patriot). Finally, future research could develop fundamental understandings, both conceptually and empirically, concerning how non-local conceptions of place attachment, as employed in this research, might inter-relate with existing social and environmental constructs, for example environmental worldviews (New Ecological Paradigm, Dunlap et al., 2000), social and environmental values (Schwartz, 1994; Dietz et al., 2005), environmental identity (Clayton, 2003) and global identity (Katzarska-Miller et al., 2012).

In conclusion, this study was based upon the observation that the literature on social acceptance has focused upon local place attachments in understanding responses to energy infrastructure projects, despite the fact that such projects are not only local in nature, but may have important regional, national, international and global aspects. For the first time, this study revealed the role of local *and* non-local attachments in explaining public beliefs and attitudes towards energy infrastructures, including high voltage power lines and systemic changes to energy systems. These results are important, since they reveal the importance of people-place relations that have been overlooked in previous studies, particular those dubbed ‘Glocal’ and ‘Nocal’ here. Future research is required to extend these findings in other cultural and political contexts, and in relation to other forms of low carbon energy infrastructure, thus providing policy makers with a more substantial explanation for public responses than the NIMBY concept.

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